



The role of canines in the lived experience of women with breast cancer: a case-based
narrative analysis of the relationship between dogs and their guardians

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Melissa Jane Symonds

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Abstract

Women with breast cancer often experience significant distress associated with a range of unmet needs, which may lead to them seeking support within their social networks to enable them to address these deficits. For many women, one frequently overlooked yet important member of this network, is the pet dog. Dogs have been cited as beneficial to health and wellbeing in various contexts; however, to date few studies have evaluated the role of companion animals in relation to cancer, and none have assessed the function of pet dogs in regard to breast cancer. This study, therefore, aimed to determine the role and perceived benefits of companion canines in the lived experience of women specifically with breast cancer.

Employing a pragmatic, sequential, mixed methods approach, and incorporating an initial quantitative online questionnaire-based survey, phase one is founded upon two pre-existing validity assessed tools, Functional Assessment of Cancer Therapy -Breast (Brady *et al.*, 1997) and modified version of the Monash Dog Owners Relationship Scale (Dwyer *et al.*, 2006); this resulted in the creation of descriptive statistics, in combination with identification of women willing to participate in phase two of the study. The second phase involved derivation of four comprehensive case studies, generated from a series of interviews, from which evolved a narrative, story, and analysis of each individual case.

The quantitative results did not permit correlation, however, individual questions elicited data to enable inter-study comparison, whilst phase two, in addition to the creation of stories for dissemination, resulted in determination of four key functions afforded by the women's dogs. Perceived as beneficial by the women, these were distraction, especially in relation to nocturnal fear of recurrence, companionship, social and communication facilitation, and haptic and visual interaction.

The relationship the women engendered with their dogs, it appeared, was of great benefit to them. It may, therefore, be advantageous to harness this benefit for other women dog-guardians in similar situations. Increasing health professionals' awareness of the importance of the dog in the complementary care of women with breast cancer, in conjunction with integration of a question concerning dog-guardianship within assessment frameworks, may provide validation for women in comparable relationships, potentially leading to enhanced wellbeing. Additionally, provision of activities to enable women to foster and maintain the relationship with their dog, whilst simultaneously enhancing their support network through engagement in relaxing activities such as canine massage classes, dog yoga and walking groups, may result in greater wellbeing and ultimately a decrease in cancer related distress.

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List of abbreviations

Abbreviation	Description
AAI	Animal Assisted Intervention
ASR	Age Standardised Rates
AWA	Animal Welfare Act
AWSA	Animal Welfare Sentience Act
BCS	Breast Cancer Scale
BPS	British Psychological Society
BRAC1	Breast Cancer Gene 1
BRAC2	Breast Cancer Gene 2
BSA	British Society
BSI	Brief Symptom Inventory
CES-D	Center for Epidemiological Studies Depression Scale
CNS	Clinical Nurse Specialist
COVID-19	SARS (Severe Acute Respiratory Syndrome) Coronavirus V-2 virus
CPC	Canadian Problem Checklist
CR	Cumulative Risk
CRUK	Cancer Research UK
DEFRA	Department for Environment, Food and Rural Affairs
DOI	Dog Ownership Interaction
DSM	Diagnostic and Statistical Manual
DT	Distress Thermometer
EC	Emotional Closeness
EU	European Union
EWB	Emotional Wellbeing
FACT-B	Functional Assessment of Cancer Therapy - Breast
FACT-G	Functional Assessment of Cancer Therapy - General
FOR	Fear of recurrence
GP	General Practitioner
HADS	Hospital Anxiety and Depression Scale
HDI	Human Development Index
HER-2	Human Epithelial Receptor 2
HP	Healthcare Professionals / Practitioners
HRT	Hormone Replacement Therapy
ICD	International Classification of Diseases
IPOS	International Psycho Oncology Society
ISAZ	International Society for Anthrozoology
IUCC	International Union for Cancer Control
LAPS	Lexington Attachment to Pets Scale
MDORS	Monash Dog Owner Relationship Scale
MRI	Magnetic Resonance Imaging
NE	Northern Europe
NICE	National Institute for Clinical Excellence
NSC	National Screening Committee
NST	No Special Type
PC	Perceived Costs
PL	Problem List
PWB	Physical Wellbeing

QOL	Quality Of Life
SA	Separation anxiety
SACT	Systemic Anti-Cancer Therapies
SDT	Self Determination Theory
SWB	Social Wellbeing
UK	United Kingdom
UN	United Nations
WHO	World Health Organisation

1 Introduction

This introduction sets the scene for a detailed examination of the pivotal role companion dogs may assume in enhancing the wellbeing of women living with breast cancer. It encompasses a discussion of the research rationale, a brief review of previous research, and outlines the aims and objectives of the present study. The researcher's stance is clarified, along with an elucidation of their assumptions and pre-conceptions pertaining to the research inquiry.

Breast cancer, also known as breast carcinoma, is rising in incidence in the United Kingdom (UK), a trend persisting for many years (Mistry *et al.*, 2011). Although this upward trajectory continues, the rate of increase has decelerated in recent years (Cancer Research UK) (CRUK, 2024). The latest published data indicates that globally breast cancer ranks as the second most prevalent cancer, accounting for 11.6% of all cases (Bray *et al.*, 2024) having briefly surpassed lung cancer from 2018 to 2022 (Sung *et al.*, 2021). Prior to this both breast and lung cancer exhibited comparable incidence of 11.6% (Bray *et al.*, 2018). However, in the UK breast cancer remains the most prevalent, accounting for 55,000 (female) cases (CRUK, 2024), 15% of all primary cancer diagnoses. Prostate cancer, the second most prevalent, comprises 14% of cases, followed by lung cancer at 13% (CRUK, 2024). In the UK incidence rates of female breast cancer increased by 24% between 1993 and 2018, peaking around 2014 (Chen *et al.*, 2020), since then incidence rates have declined by approximately 1.8%, (CRUK, 2024) possibly due to reduced use of hormone replacement therapy (HRT) identified as an aetiological factor for breast cancer in 2011 and subsequently replaced by preparations containing less oestrogen (Vigneswaran and Hamoda, 2022). Currently, the incidence rates have stabilised, however, over the coming years it is projected incidence rates will slowly creep up, with a consistent 1% per annum increase predicted, reflecting an aging population (CRUK, 2024; Mistry *et al.*, 2011).

According to statistics supplied by the London School of Hygiene and Tropical Medicine to Cancer Research UK, breast cancer survivorship has significantly improved over the past four decades; women are now twice as likely to survive compared to twenty-five years ago, with over 80% of women with breast cancer aged 15 to 64 years surviving 10 years or more (CRUK, 2024). Projections based on 2010 incidence figures suggest that by 2020, 840,000 individuals may have been living with breast cancer in the UK, this is further projected to rise to 1,212,000 by 2030, and 1,683,000 by 2040 (Maddams *et al.*, 2012). Although breast cancer survival is historically lower in the UK than other Northern European countries, such as Sweden and Finland, this disparity has been reducing in recent years, with the gap predicted to further narrow (Dafni *et al.*, 2019).

With the increasing survival in breast cancer, powered by medical advancements facilitating early detection and improved treatment efficacy, a shift towards assessing survival not only in terms of life years saved, but also in relation to quality of life (Arnold *et al.*, 2022), has led to the recognition that a significant factor in the achievement of quality of life, and reduction of cancer related distress (Travado *et al.*, 2017), a phenomena defined as a “multifactorial, unpleasant experience of a psychologic, social and or physical nature...”, (Riba *et al.*, 2019), are unmet needs (requirements women feel they lack and need, to enable them to cope with the challenges of the cancer diagnosis, treatment and living with and beyond the cancer) (Şengün İnan *et al.*, 2023). If cancer related distress is to be mitigated and wellbeing fostered these requirements must be addressed (Travado *et al.*, 2017).

The prevalence of cancer related distress has been subject to significant assessment. One systematic review incorporating 70 studies, established distress within a population of 10,071 cases ranged from 30% to 40% (Mitchell *et al.*, 2011), whereas a North American study of data from 55 centres, 4664 cases, reported a slightly higher average incidence, 46.2%, with a range spanning 30.6% to 63.8%, across all diagnoses (Carlson *et al.*, 2019). In this latter case distress levels were measured using the Distress Thermometer (DT) a visual analogue scale developed by (Holland and Bultz, 2007) to gauge self-reported distress levels. A score ≥ 4 , it is suggested by Holland and colleagues (Holland and Bultz, 2007) should trigger review of the patient’s concerns and referral to appropriate psychological services.

In the breast cancer specific cohort of Carlson and colleagues., (2019) study, 46.0% of the 1117 participants reported $DT \geq 4$, in contrast a smaller study of 849 participants (Mehnert *et al.*, 2018) found 51.8% had $DT \geq 5$. Furthermore, a systematic review incorporating seventeen additional studies with a total cohort of 3970 participants revealed $DT \geq 4 = 62\%$ and $DT \geq 5 = 45\%$ (Sun *et al.*, 2022), thus highlighting the challenges with ascertaining the extent of the problem of distress among women with breast cancer.

Alongside efforts to determine the prevalence of distress, which it is recognised will fluctuate throughout the cancer trajectory (Vitek *et al.*, 2007), many studies have sought to identify the common unmet needs women attribute to the distress experienced, established as those associated with physical concerns, practical challenges, family / social impacts, spiritual worries, and emotional aspects of life; these have been incorporated into a range of psychosocial assessments, including the Problem List, 35 potential causes of concern or unmet needs, originally developed alongside the DT (Holland and Bultz, 2007; Vitek *et al.*, 2007), and the Canadian Problem Checklist (CPC), a similar list of 21 items produced by the Canadian Partnership Against Cancer (Bultz *et al.*, 2011). In conjunction

with creating the DT and PL, Holland and Bultz, (2007) also advocated for the International Psycho Oncology Society (IPOS) to recognise the concept of distress as the 6th vital sign associated with cancer (Holland *et al.*, 2011), this has led to global adoption of the DT, also now the standard tool for assessing distress in the UK (Ma *et al.*, 2014).

There have been numerous attempts to pinpoint the factors, or unmet needs most likely to be associated with distress for subsections of the breast cancer community, to enable the development of targeted services (Lo-Fo-Wong *et al.*, 2020). Studies have indicated there is a potential those of a younger age (Clark *et al.*, 2017), those who have dependents, especially young children (Admiraal *et al.*, 2013), those who have more advanced disease (Cardoso *et al.*, 2016; Fallowfield *et al.*, 2021), undergo multimodality treatment (Admiraal *et al.*, 2013), or live in rural areas (Eggins *et al.*, 2022) may experience greater distress. This has led to the realisation that due to the multitude of contributing factors a universal or population-based strategy is unlikely to be effective or be cost efficient. Therefore, a holistic, individualised, person-centred approach has been proposed (Fallowfield *et al.*, 2021).

The formalisation of the assessment needs for individuals with cancer was incorporated into the National Institute Clinical Excellence (NICE) guidance for Improving Supportive and Palliative Care for Adults with Cancer (NICE, 2004). Recommendation two states “assessment and discussion of patients’ needs ...should be undertaken at key points...”, also within the guidance is a “Model of Professional Psychological Assessment and Support”, a framework consisting of 4 levels of support ranging from that provided by all health professionals the patient may encounter, to specialised care delivered by qualified mental health professionals (NICE, 2004).

The Healthy London Partnership in conjunction with Macmillan Cancer Support have further introduced a “Psychosocial Care Pathway”, based upon the NICE framework. Accompanying guidance suggests those with DT score of <5 equivalent to level 1 of the NICE model, (Transforming Cancer Services Team, 2020, pg.71) require minimal psychological support, as they are generally able to rely upon their intrinsic capabilities and the support of their social network, to adjust to the diagnosis (Transforming Cancer Services Team, 2020, pg.57). Given the recorded distress levels within breast cancer cohorts mentioned above ranged from DT≥4 = 46% (Carlson *et al.*, 2019) to DT≥4 = 62% (Sun *et al.*, 2022), this implies many women with breast cancer must source their own forms of support and draw upon external resources in addressing their needs.

With the increasing survivorship and evidence suggesting approximately 50% of women will experience cancer related distress during their disease trajectory, due to a range of unmet needs,

coupled with the potential demand on services, there is a critical need to optimise the support available to the patients. Whilst support from family and friends has been shown to be valuable in aiding women (Kroenke *et al.*, 2012) and can partially fulfil their unmet needs, some women have limited support (Vilhauer, 2008), do not want to be perceived as burdensome (Naik *et al.*, 2020), or find it challenging to share their concerns with their loved ones due to fear of upsetting them (Beatty *et al.*, 2008) or other reactions (Halkett *et al.*, 2007). Consequently, for some women there is a need to source other external support, this may come in the form of a companion animal, often the pet dog.

Research has demonstrated in relation to healthcare the presence of a dog can enhance emotional wellbeing, and confer physical benefits, such as pain reduction (Coakley and Mahoney, 2009; Engelman, 2013; Bolden *et al.*, 2017), and positive effect on hormone levels (Moretti *et al.*, 2011; Abreu and Figueiredo, 2015). Specifically, in a cancer context, the effects of dog companionship have resulted in a decrease in stress, worry and fatigue (Johnson *et al.*, 2008; Marcus, 2012; Fleishman *et al.*, 2015; Osório and Silva, 2017). These early oncology related studies primarily focussed upon investigation of the impact of Animal Assisted Intervention (AAI) animals, defined as “an animal who is included into the work of a health professional” (Howell *et al.*, 2022), predominantly these involved engagement with dogs (Marcus, 2012). A recent systematic review by Holder and colleagues., (2020), identified 26 out of 32 oncological studies assessed, were associated with dog interaction. These studies highlighted benefits such as “distraction, entertainment, movement, human interaction, physical touch” and connectivity resulted from the dogs being in the oncology context (Holder *et al.*, 2020).

More recently focus has turned to the impact of the companion animal, “pet with no specialised employment training” (Howell *et al.*, 2022) upon the experience of cancer, centring on aspects deemed to relate to quality of life. These studies, of which there are few, have sought to quantify the impact of either pet, or specifically dog guardianship, in relation to wellbeing (Ingram and Cohen-Filipic, 2018; Trigg, 2021). Ingram and Cohen-Filipic, (2018) found no relation between wellbeing and the human-dog dyad, however depression in those who had completed their cancer treatment was moderated by dog guardianship; conversely Trigg, (2021) established pet ownership did predict positive mental health scores, although no statistically significant relationship existed.

Studies incorporating a qualitative aspect, whether as part of a mixed methods approach, or as independent research, have utilised thematic analysis methodology; whilst these offer some insight into the lived experience of pet guardianship for those with cancer, specifically highlighting the benefits and challenges of pet ownership (Nitkin and Buchanan, 2020; Currin-McCulloch *et al.*, 2023),

they do not offer an in-depth analysis of the lived experience or nature of the support afforded by the animals, and to date it is believed Currin-McCulloch and colleagues., (2023) is the only study specifically focussed on breast cancer.

To the best of the researcher's knowledge this is the first study to employ a case based narrative analysis methodology to investigate the role pet dogs assume in supporting women with breast cancer. Through the creation of detailed accounts of the women's lived experience, the psychological benefits of existing dog guardianship for women with breast cancer are to be illuminated. These accounts will enable health professionals and other readers to develop a comprehensive understanding of the impact a dog can have on wellbeing as well as an appreciation of the challenges these women may encounter throughout the cancer trajectory, thus, recommendations for a variety of sectors will be proposed, that may not only enhance the wellbeing of women dog guardians living with breast cancer, leading to a potential reduction in cancer related distress, but may also help to maintain the relationship between dog and guardian during times of stress and uncertainty.

Therefore, this research seeks to understand the ways existing relationships between dog and guardian can benefit women with breast cancer, through in-depth analysis of lived experience.

In undertaking this project, the following objectives have been identified.

- To assess the relationship between guardian (women with breast cancer), and their dogs, based upon the guardian's perception.
- To assess the quality of life of the dog-guardians (women with breast cancer), to enable comparison with standardised results for women with breast cancer (dog-guardianship status unknown).
- To discover how the relationship between dog and guardian is perceived by the guardian, and whether the guardian indicates any changes to the relationship in respect to the impact of a diagnosis of breast cancer.
- Propose practical recommendations for healthcare providers and those in other sectors, in regard to raising the awareness of the dog-guardian relationship when caring for the wellbeing of women with breast cancer.

It should be noted however that this research is predicated upon a range of assumptions, presumptions, suppositions and preconceptions, formulated in relation to the researcher's background, experience, prior knowledge, morals and values. It is therefore crucial to consider the researcher's positionality within the research, their influence and power over the research process and findings (Jamieson *et al.*, 2023; Olmos-Vega *et al.*, 2023).

1.1 Positionality and reflexivity

Approaching research with reflexivity, a concept intertwined with the philosophical principles of ontology and epistemology allows the researcher to develop a self and process analytical approach (Olmos-Vega *et al.*, 2023), one where every aspect of the research framework is analysed, and preconceptions and assumptions are questioned (Walsh, 2003).

Reflexivity may be viewed as an extension of reflection, incorporating self-analysis or critique (Olmos-Vega *et al.*, 2023), intentionality (Berger, 2015), repetition (Walsh, 2003) and challenge (Palaganas *et al.*, 2017). Both processes centre upon the development of new perspectives (Ng *et al.*, 2019), reflection being a retrospective act usually focussed upon learning from an event or situation in which the individual does not necessarily need to participate (Marshall, 2019), whereas the essence of reflexivity is unequivocally "self" (Aron, 2000), and the interrelation between self, situation, practice, actions and behaviours (Darawsheh, 2014).

There are a wide range of definitions of reflexivity (Walsh, 2003; Darawsheh, 2014; Dodgson, 2019; Ng *et al.*, 2019; Olmos-Vega *et al.*, 2023). In this context the researcher considers it to be a repetitive process (Olmos-Vega *et al.*, 2023), involving introspection (Darawsheh, 2014), self-interrogation of own beliefs and values (Jamieson *et al.*, 2023), resulting in a detailed examination of the connectivity between intrinsic and extrinsic factors that may impact upon the creation of the findings (Olmos-Vega *et al.*, 2023).

Reflexivity is required throughout the research process, especially one founded upon a qualitative approach, it adds transparency, and the determination of bias which may arise during the research process journey (Dodgson, 2019). Later in the thesis the impact of self on the co-creation of the narratives will be examined. Prior to this it is important for the researcher to question their preconceptions and pre-existing knowledge to enable the generation of a research framework that permits the development of new knowledge in a transparent, honest way, thus promoting the integrity of the process and findings (Narayanasamy, 2015; Dodgson, 2019).

Traditionally associated with qualitative approaches, reflexivity is increasingly recognised as important in quantitative study (Kingdon, 2005; Walker *et al.*, 2013; Jamieson *et al.*, 2023), generally these approaches exhibit greater empirical rigour and inherent robustness, hence reflexivity may not be so crucial (Jamieson *et al.*, 2023), A dichotomy exists within mixed methods research, failing to incorporate reflexivity risks overlooking the nuances observed with the methodological application (Jamieson *et al.*, 2023), yet it may be “superfluous” (Walker *et al.*, 2013), In the current study both phases of the research are socially situated (Kingdon, 2005), additionally the researcher is engaging in a transformative process alongside conducting the research, therefore adopting a reflexive approach throughout the inquiry was deemed beneficial (Walker *et al.*, 2013).

Reflexivity can be approached by dividing the discourse into four sections, as identified by Walsh, (2003), these being “personal, interpersonal, contextual, and methodological”, responding to a series of “prompt questions” (Peddle, 2022; Jamieson *et al.*, 2023), or production of an autobiographical account (Walsh, 2003). A method incorporating autobiographical, contextual and inter-relational analysis was adopted as it was perceived it would set the scene for the development of the stories later in the thesis. It should be noted methodological aspects will be further elaborated upon later in the writing, and reflexivity is revisited throughout the document.

Breast cancer was selected as the study focus for several reasons. As the most prevalent cancer (CRUK, 2024; Bray *et al.*, 2024), it is anticipated the data set will be substantial therefore offering a greater probability of engagement, there are also comparatively more women dog guardians than men (Murray *et al.*, 2010; Murray *et al.*, 2015), and women represent the majority of breast cancer patients (Arnold *et al.*, 2022). Consequently, the intersection between dog guardianship and breast cancer incidence is presumed to be considerable.

The researcher, a therapeutic radiographer with extensive theoretical knowledge of cancer, has not engaged in a direct patient-facing role for several years, nevertheless her prior experience in supporting women undergoing radiotherapy provides her with insight into the challenges and treatments that women diagnosed with breast cancer may encounter. Despite her expertise the researcher does not position herself as an authority on the subject, instead asserts the true experts are the patients (Anampa-Guzmán *et al.*, 2022), in this case the women, who are the experts of their own experiences.

Although the researcher has not personally faced breast cancer, her age places her within the criteria for breast cancer screening in the UK (Godley *et al.*, 2017). Having recently undergone her first mammogram, and having experienced previous breast lumps and assessment, provides her with

some perspective as to the apprehension associated with mammography recall and the subsequent progression along the treatment trajectory. However, it is acknowledged this perspective does not equate in any way to having to personally deal with a diagnosis and treatment, and it is recognised every individual's journey is unique. Additionally, the researcher is the daughter of a long-term breast cancer survivor; this affords her a distinctive viewpoint, on the potential impact of breast cancer on an individual's life. This perspective particularly highlights the considerable time obligation associated with numerous appointments, and concerns around impact on others. This insight and previous experience have enabled the researcher to foster a greater sense of empathy toward the research cohort, compared to those with a different malignancy or condition. It should be acknowledged this personal experience also shapes the perception that women with breast cancer have many unmet needs, which are currently not met by conventional services.

The researcher, also an academic, has a solid understanding of scholarly conventions, particularly within the sphere of general and traditional research methodologies. While this familiarity provides a foundational understanding of these methods, it also implies pressure and accountability to ensure accuracy and precision in the research process from the outset. However, in this circumstance the researcher maintains the self-perception of novice, particularly concerning the methodology being employed in the present study, and in respect of their lack of familiarity with the academic discipline of psychology. Psychology being an academic domain they have not previously explored, currently there exists a deficit in background knowledge, contributing to apprehension regarding the ability to produce work of quality standard from a psychological perspective. These uncertainties evoke feelings of being an imposter and leads the researcher to perceive their venture into this unfamiliar realm as a courageous undertaking.

Therefore, due to limited familiarity with the subject matter, the researcher holds few expectations in respect of the potential psychological aspects that may be revealed. They currently lack proficiency in the specialised terminology, language, and theoretical constructs in use within the field. This coupled with the unfamiliarity of the methodology employed, allows the researcher to potentially approach the research with greater objectivity, whilst this is not the primary aim of qualitative study this may enhance the quality of the findings. It should be noted the researcher has previously conducted independent, primary research as a component of level seven study, and more recently as a co-researcher, both of these investigations being centred on breast cancer, however in regard to the nature of this research regards themselves as a novice embarking on a substantial transformative learning process.

Another fundamental assumption of this study is that the presence of a strong bond with a dog serves as a beneficial factor for individuals with cancer. This assertion stems from anecdotal evidence gathered through informal discussions across a range of settings, including dog training classes, engagements as a public speaker for a UK based charity specialising in canine assisted research associated with a dog's ability to detect cancers amongst other diseases, as well as via accounts from individuals who attribute their dogs with providing support during their cancer journey. One such example is Claire Guest, who documented her experiences in her book *Daisy's Gift* (Guest, 2017), an account of how her dog Daisy not only provided companionship throughout her cancer journey, but was accredited as being instrumental in the early detection of the disease, another example being the distress documented in articles about Kemo (aka Chemo) (the dog credited as aiding Olly during his cancer treatment) who unfortunately went missing, regrettably as far as the researcher is aware, he was never recovered (Bedford Independent, 2020). Therefore, the researcher suggests that dogs confer a certain degree of benefit within the context of the cancer experience, although the exact nature of this benefit remains undetermined, hence the aim to explore the psychological aspects of this relationship.

A third area of interest of the researcher is dog training, as a qualified dog trainer and avid dog enthusiast, they view the dog-guardian relationship as a partnership, assuming those with a close relationship with their dog value this bond and actively work to nurture and maintain it. Through professional interactions, the researcher has observed first-hand the influence of emotions on the dog-guardian relationship and has identified the guardian's wellbeing as being critical in sustaining this bond. It is therefore assumed quality of life and wellbeing will impact the relationship observed between dog and guardian.

Ethical principles will guide the research at all stages, forming the basis of the ongoing reflexive approach. Specifically, the four ethical principles of Beauchamp and Childress, (2001), autonomy, beneficence, non-maleficence, and justice, will underpin the study. It is recognised the women participating in the research are vulnerable (Narayanasamy, 2015), both due to the nature of their medical condition and the extent of personal information they disclose to the researcher. Ensuring non-maleficence is fundamental to the research (Bufacchi, 2020). Whilst all studies carry some risk (Brew *et al.*, 2013), the vulnerability of the cohort and the sensitive nature of the topic, necessitates the researcher to exercise great caution to prevent distress. Every effort will be made to minimise risk at every stage; hence the methodology will be meticulously constructed to mitigate potential harm.

One way of promoting greater autonomy and reducing the perceived power imbalance inherent in qualitative research (Dodgson, 2019) is to structure the interview questions in such a manner that it empowers participants to only share information they feel comfortable disclosing. This approach allows participants to retain a degree of control over the discussion. The interview question will be carefully crafted to uphold the principle of autonomy (Ross, 2017), and additional strategies to promote autonomy will be delineated within the methodology section.

In regard to beneficence, whilst the direct benefits of participating in the research may not be immediately apparent, it is envisaged engagement in the study may offer cathartic effects for the participants. Narayanasamy, (2015) demonstrated participants who had the opportunity to share their experiences identified it as a positive, enabling them to reflect upon events and construct new meaning and perspective, although it is acknowledged such cathartic effects may not be applicable in every research cohort.

Justice is associated with equitable access and opportunity (Mamo and Fishman, 2013). In selecting the method of distribution of the study survey, anticipated to be via social media, it is hoped anyone meeting the eligibility criteria will have the chance to participate, however it is recognised there are sections of the population that do not actively engage with social media (Gelinis *et al.*, 2017), which may potentially preclude them from participating, hence a bias to those with access will exist.

In conjunction to adhering to the four ethical principles (Beauchamp and Childress, 2001), the researcher will also prioritise and maintain anonymity throughout the research process, and in all subsequent research outputs. Furthermore, comprehensive informed written consent will be obtained from all participants prior their engagement, ensuring their full understanding of the study and agreement to participate.

This list is not exhaustive, rather it represents the key factors influencing the primary direction of the research from the outset. In summary the researcher approaches this research with the mindset of learner, possessing foundational knowledge of breast cancer and its emotional impacts. Whilst there is an assumption the women participating in the study will have a favourable relationship with their dogs, the precise nature of this relationship is yet to be explored and the psychological dimensions that underpin it discovered.

The researcher hopes to develop a brief yet meaningful relationship with the women participating with the aim being to co-create their narrative in a manner characterised by empathy, transparency, and integrity. It is imperative for the researcher to honour the authenticity of the women's stories,

reflecting a deep regard for the trust bestowed upon the researcher by the participants. Additionally, considering the interdisciplinary nature of the inquiry, which may potentially encompass aspects of psychology, anthrozoology and oncology, the researcher anticipates the process will be inherently transformative. This transformation is expected to draw upon the researcher's personal resources, perseverance, and resilience, yet be a positive experience.

As discussed earlier, reflexivity should be a continuous process throughout the research, therefore, to align with recommended reflexive procedures outlined by Thorpe, (2004), a research journal will be maintained; the journal takes the form of a folder separated into segments corresponding to the various aspects of the study. Within these sections reflective thoughts, queries, and responses will be documented on sticky notes.

Within this introduction the background and rationale for the study has been presented, including supporting evidence advocating the imperative to explore avenues beyond conventional services to address the needs of women living with and beyond cancer. The potential of companion dogs to enhance the wellbeing of women with breast cancer has been articulated, along with the assumptions pertaining to this relationship. Additionally, the researcher's background and their stance in relation to the research has been outlined and discussed.

2 Literature analysis

2.1 Introduction

Within this section a comprehensive critical analysis of the current perspectives about breast cancer are presented, encompassing both global and national prevalence and mortality rates, the predisposing and modifiable factors, pathogenesis, screening, and treatment options. Followed by an in-depth analysis of the psychological impact of a breast cancer diagnosis, the incidence of distress, the nature of unmet needs, potential coping mechanisms employed and provision of psycho-oncology support. Finally, a thorough critical evaluation of contemporary theories surrounding the advantages of AAI in the oncological setting are proffered, including application of these theories specifically in the context of companion dogs and breast cancer.

2.2 Breast cancer

2.2.1 Prevalence and mortality

In 2020 according to Globcan estimates, a database of cancer incidence and mortality reports from 185 territories (Arnold *et al.*, 2022), there were globally 2.3 million new diagnoses of breast cancer (both male and female), an increase from 2.1 million in 2018 (Wild *et al.*, 2020, pg. 25), accounting for 1 in 4 of all female cancer cases, making it the most prolific cancer in the world (11.7% of all incidence), and the most frequently occurring cancer in women, responsible for 24.5% of all female cancers (Sung *et al.*, 2021). At this time there were also approximately 7.8 million breast cancer survivors worldwide (Arnold *et al.*, 2022), and mortality amounted to 685,000 deaths, accounting for 6.9% of the total global cancer-related mortality. This translates to breast cancer being associated with one out of every six instances of female cancer related mortality (Arnold *et al.*, 2022; Sung *et al.*, 2021).

To follow, Globcan estimates, predictions of incidence and mortality and survival data applicable to the UK will be considered under the following subdivisions, first from a global perspective, next as part of Northern Europe, within the banner of the EU, finally then as a separate country. Information is presented in terms of age standardised rates (ASR) for incidence and mortality, percentages of total cancer burden, cumulative risk (CR) and estimated case numbers.

Current and recent global trends in incidence and mortality suggest that as of 2020 breast cancer has emerged as the most frequent presentation of all malignancies (surpassing lung cancer as the most frequent diagnosis in 2017), and female only cancers (Sung *et al.*, 2021), breast cancer being the most

pervasive female cancer in 159 of the 185 territories surveyed, cervical cancer the second most diagnosed cancer in 23 of the other 26 regions. With Arnold and colleagues., (2022) adding it was also the most predominant cause of death in 110 of the countries, this was established through analysis of population statistics derived from the United Nations website in conjunction with the Globcan data.

Categorising the 185 countries into those with a very high, high, medium or low human development index (HDI), a metric based upon “average achievement in health, education and income” designated by the United Nations as part of their Development Programme established in 1990 (United Nations Development Programme, 2024). A comparison of emerging or transitioning countries (low and medium HDI) with those transitioned or emerged (high and very high HDI), reveals that whilst in 2020 breast cancer was the most prolific malignancy within both transitioning and transitioned countries, a higher incidence of the disease was identified in the emerged countries, (including the UK) (Sung *et al.*, 2021). Twenty percent of all cases (29.7 ASR per 100,000) occurred within transitioning countries, nearly twice as many (55.9 ASR per 100,000) arose within the transitioned territories (Arnold *et al.*, 2022; Sung *et al.*, 2021). Although the incidence was lower within the emerging areas, the mortality rate was significantly higher with 30% of all deaths being related to these regions (Arnold *et al.*, 2022); this is thought to be attributable to restricted access to early detection, therefore later disease presentation (Wild *et al.*, 2020) plus limited or ineffective treatment options. Overall, a 17% higher possibility of mortality existed for women in low to medium HDI regions (Arnold *et al.*, 2022).

Further categorisation of the countries of the world into 20 regions results in the UK being considered under the umbrella term of “Northern Europe” (NE). The 2020 data indicates NE represents the fourth highest area of incidence of female breast carcinoma, with an ASR of 86.4, CR 9.4%, and a 3.7% contribution to the global breast cancer burden (Arnold *et al.*, 2022). In contrast “Australia and New Zealand”, ranked as the region with the highest prevalence (CR 10.4%), yet had approximately 75% fewer cases, and only contributed 1% to the global burden (Arnold *et al.*, 2022), possibly due to increased awareness, earlier detection, and more effective treatments being available within this region (Wild *et al.*, 2020, pg.383). Despite the high incidence rate in NE, mortality risk was comparatively low, CR 1.5%, accounting for 2.6% of global breast cancer mortality, with 80% of cases and 70% of deaths occurring in post-menopausal women (Arnold *et al.*, 2022).

Drawing upon historical European mortality data from 1980 to 2017, which incorporated the European Union (EU) states (excluding Cyprus due to limited data) and the UK (EU+UK), and in conjunction with population data supplied by the United Nations, Wojtyla and colleagues., (2021) employed a regression model to predict breast cancer mortality for the period 2017 to 2025. By 2025

it is predicted the UK will experience the most significant decline in breast cancer related mortality within the EU +UK region, decreasing from 11,512 deaths in 2017 to an estimated 10,500 deaths in 2025 (12.2 per 100,000 population). Across Europe as a whole, breast cancer mortality is projected to decrease from 14.4 per 100,000 in 2017, to 12.0 per 100,000 in 2025, a reduction of 15.6% (Wojtyla *et al.*, 2021).

As of 2017 mortality rates had declined by 3.9% (from 2012 rates), across the EU+UK, by 5.2% across the 14 original EU states (including the UK), and 6.9% in the UK, by 2025 this is expected to fall by another 15% across the 14 older European countries and by 19.2% in the UK (Wojtyla *et al.*, 2021). The corresponding number of breast cancer deaths avoided in the UK is predicted to total 150,000 by 2025 (*ibid*, 2021). However, whilst mortality reduces, the UK incidence of breast cancer is predicted to increase by approximately 1% per annum, for illustration a change from 45,758 in 2007, to 57,442 diagnoses by 2030, (a computation based upon a combination of predictions and extrapolation informed by incidence data supplied by the “UK Association of Cancer Registries” and population estimations from the Office of National Statistics) (Mistry *et al.*, 2011). Overall, it is envisaged there will be a reduction in risk attributable to the favourable impact of screening plus recent decline in the use of menopausal HRT (Rossouw *et al.*, 2002), which is slowly being superseded by less iatrogenic hormonal options, however a rise in incidence is forecasted due to an aging population (Mistry *et al.*, 2011).

Further prognostications suggest by 2040 the global breast cancer burden may escalate to 3 million cases per annum (Arnold *et al.*, 2022), similarly mortality is predicted to rise to 1 million deaths per year by 2040, a 50% increase from 2020 figures. Whilst many of these cases will persist in transitioned nations, there is expected to be a proportional shift, with an anticipated increase of 3.8% to 22.2% in incidence, and 5.1% rise to 35.2% in mortality occurring in emerging countries (Arnold *et al.*, 2022). This trend corresponds with demographic shifts characterised by an aging population, and expected population growth, it does not take into account any changes due to the implementation, or enhanced efficacy of screening protocols, new or novel therapeutics, the influence of modifiable factors or the eventuation of the recent Covid 19 pandemic, the impact of which, in relation to diagnostic delay and mortality associated with breast cancer, is only just becoming apparent.

2.2.2 Predisposing and modifiable factors of breast cancer

The connection between breast cancer and a range of predisposing factors is well established, although the precise mechanisms underlying these associations are in many cases yet to be determined (Daly *et al.*, 2021). An area where risk has been more clearly defined is that associated

with genetic predisposition, and its influence on cancer susceptibility; whilst it is apparent there is a definitive link between genetic factors and the incidence of breast carcinomas, the estimated number of gene variants implicated in the development of breast cancer range from 25 to 65 (Dorling, 2021; Kaur *et al.*, 2018), as yet there is no consensus as to how many patterns of mutation exist. Genes implicated in the high penetrance mutations (those with high probability of causing breast cancer) are still being discovered, association with BRAC1 (BReast CAncer gene1), BRAC-2 (BReast CAncer gene2), the most detected gene variants, both carry an approximate risk of breast cancer of 67 to 85% (Ngeow *et al.*, 2017). Whilst other genes are also implicated, as are familial syndromes which increase gene penetrance, for example TP53 (Tumour Protein 53) mutation, linked with Li-Fraumeni Syndrome, (Schon and Tischkowitz, 2018). Furthermore, specific variants are recognised as having a higher prevalence within certain populations, for example, an increased probability of BRAC1 and BRAC2 genes exist within the Ashkenazi Jewish community, reasons for this disparity are currently inconclusive (Frey *et al.*, 2024). Despite these known associations, the hereditary risk of breast cancer is relatively low, current estimates indicate 5-10% of cases, predominantly germline mutations, are directly inheritable (Cancer Research UK, 2024). Most tumours arise from sporadic somatic mutations (Kaur *et al.*, 2018), induced through individual exposure to environmental stimuli, associated with modifiable factors, (including alcohol consumption, diet, and lactation practices) alongside non-modifiable determinants (time of menarche, menopause) (Daly *et al.*, 2021).

In 2016 an estimated 4.2% of global cancer mortality was related to alcohol ingestion (Wild *et al.*, 2020, pg. 70), with 100,000 of the two million worldwide breast cancer presentations in 2020 attributed to alcohol (WHO, 2024a). The causative mechanism is not yet fully understood hypotheses currently focus on the potential of alcohol concentrating in the blood stream resulting in an increase in endogenous oestrogens, which may potentiate the development of breast cancer (Seitz *et al.*, 2012). Exposure to oestrogen is believed to be one of the most potent factors responsible for the development of breast cancer (Santen *et al.*, 2015).

Oestrogen is assumed to be both mutagenic and mitogenic (Lovett *et al.*, 2017), stimulating rapid mitosis; whilst this is a functional part of a female's normal menstrual cycle, long exposure initiated through early menarche and later menopause in addition to hormonal manipulation via oral contraceptives (Islami *et al.*, 2015) or menopausal HRT (Rossouw *et al.*, 2002), may extend or increase life exposure to oestrogen, or oestrogen synthetic ethinyl oestradiol (Zolfaroli *et al.*, 2018). With each mitotic cycle the probability of a mutation culminating in malignancy escalates, hence the inclusion of advancing age as a recognised cancer risk factor (Eppenberger-Castori *et al.*, 2002).

Unfortunately, in approximately 70% of breast cancer cases, those considered oestrogen dependent (Turner *et al.*, 2017), continued oestrogen exposure stimulates tumour growth subsequent to the formation of the initial mass (Santen *et al.*, 2015), through activation of cell signalling pathways promoting sustained mitotic regeneration of the malignant cells; however, this reliance on oestrogen also presents opportunities for therapeutic intervention aimed at attenuating or obstructing the hormone's effects (Shagufta and Ahmad, 2018).

Further indication that levels of oestrogen exposure could play a pivotal role in the potential development of breast carcinoma are revealed through an exploration of its correlation with obesity; certainly within the latest World Cancer Report, Wild and colleagues., (2020, pg.101) assert there is "strong evidence... for an association between obesity and increased risk of cancers of the postmenopausal breast cancer". In the UK, it is thought dietary factors are implicated in approximately 6.3% of all cancer cases (Brown *et al.*, 2018). Although direct causal link with oestrogen remains undetermined, it is recognised obesity can modulate oestrogen levels, due to its interaction with adipose tissue (Bhardwaj *et al.*, 2019). Fat tissue may function as a repository for oestrogen, be a site of oestrogen biosynthesis, induce inflammatory responses (which are known independent carcinogenic occurrences) and catalyse the conversion of excess androgens into oestrogens (Cleary and Grossmann, 2009). Hence, obesity emerges as a potentially significant determinant in the development of breast cancer, especially amongst post-menopausal women (Gérard and Brown, 2018). Intriguingly, obesity may have an inverse relationship in pre-menopausal individuals, conferring certain protective effects (Qureshi *et al.*, 2020).

Further potentially preventative factors are parity and breast feeding. Research indicates parity alone can reduce the risk of oestrogen dependent tumours by as much as 18%, whereas parity when coupled with breast feeding reduces cancer risk by up 18% in women with non-oestrogen dependent tumours, although exerts minimal additional effect on oestrogen positive disease (Fortner *et al.*, 2019). This protective effect is thought to be partially moderated by the reduction in oestrogen exposure (Obeagu and Obeagu, 2024), in combination with lifestyle related factors altered in response to pregnancy. Parity, and in particular breastfeeding, induces a temporary decline in circulating oestrogen and progesterone levels, due to disruption of the menstrual cycle resulting from pregnancy or lactation, consequently, decreasing pre-menopause, thereby lifetime oestrogen exposure (Anstey *et al.*, 2017). Breast feeding is also thought to stimulate normal hyperplasia of breast tissue and removal of potential apoptotic cells (Obeagu and Obeagu, 2024). Additionally, breastfeeding mothers often adopt healthy behaviours during the lactation period including abstinence from, or reduction in, alcohol consumption or maintenance of a balanced diet (Procter and Campbell, 2014), factors that may exert further protective effects.

Although pre-disposing factors associated with genetics, advancing age, onset of menarche or menopause may not be easily negated or reduced, three key modifiable factors have been identified (Tamimi *et al.*, 2016). Determined by the World Health Organisation through its Global Breast Cancer Initiative (Anderson *et al.*, 2021), a project aiming to reduce the global breast cancer burden by 2.3% per year via its commitment to reduce alcohol consumption, encourage management of body weight and increase physical activity, and greater adoption of breast feeding, thereby potentially preventing 2.5 million deaths by 2041 (WHO, 2024b).

Three primary pathways have been identified, dedicated to “health promotion, early detection and timely diagnosis, and comprehensive breast cancer management” (Anderson *et al.*, 2021; WHO, 2024b). The health promotion arm incorporates a range of initiatives designed to achieve the aim of ensuring 60% or more of breast carcinomas are diagnosed at an early stage (stage I or II) (WHO, 2024b). Via a consortia of partner organisations and the UN working collaboratively with governments worldwide, it is hoped the global cancer burden can be reduced through promoting activity and a less sedentary lifestyle, currently associated with an increased risk of breast cancer of up to 15.5% (Lee *et al.*, 2021), advocating breast feeding through support (Anstey *et al.*, 2017) and addressing obesity which is gradually exceeding smoking as the most cancer causing modifiable factor (Ligibel *et al.*, 2014).

Although not explicitly outlined in the WHO strategy, the dissemination of findings from the Women’s Health Initiative, a trial examining the impact of diet and supplements including HRT upon post-menopausal women’s health, has resulted in a substantial decline in the use of oestrogen stimulating HRT (Rossouw *et al.*, 2002), additionally development of less oestrogen initiating products, resulting in a significant reduction in breast cancer presentation within transitioned countries since report publication in 2002 (Wild *et al.*, 2020, pg.25). This trial was halted prematurely due to adverse effects, including an increased incidence of breast cancer beyond expected population norm (Rossouw *et al.*, 2002).

Furthermore, within transitioned territories awareness is gradually leading to reduction in exposure to potentially carcinogenic factors responsible for the development of breast cancer; however it is recognised within transitioning countries becoming “westernised” there is a possibility modifiable factors associated with higher burden of breast cancer observed in the transitioned areas become adopted by those in the low to medium HDI regions (Fidler *et al.*, 2018), consequently it is anticipated an upward trajectory of worldwide breast cancer incidence will persist for the foreseeable future, certainly until at least 2040 (Arnold *et al.*, 2022).

2.2.3 Breast cancer pathogenesis

Invasive breast tumours can be categorised into two principal types, those considered rarer or specialist types (25% of breast carcinoma's), encompassing seventeen subtypes such as lobular, tubular, inflammatory (Weigelt *et al.*, 2008), and the more pervasive invasive ductal carcinoma, recently re-classified as "breast cancer no special type (NST)", which represents 70%, the greatest portion of breast cancers diagnosed (Wild *et al.*, 2020, pg.382). Most tumours are also classified as oestrogen receptor status positive (Turner *et al.*, 2017), the prevalence of this subset of tumours has been steadily increasing; this is largely thought to be associated with the modifiable factors, alcohol, diet and hormone use, and their influence on oestrogen generation (Tamimi *et al.*, 2016). However, being oestrogen dependent they are also potentially more susceptible to hormonal intervention, reduction of oestrogen offers an effective method of limiting tumour progression (Pan *et al.*, 2017).

Tumours devoid of oestrogen receptors are designated oestrogen receptor status negative, in some cases they may exhibit alternative or additional receptors for either progesterone, or a human epithelial receptor-2 (HER-2). HER-2 positive tumours often exhibit a more aggressive phenotype, associated with a poorer prognosis (Łukasiewicz *et al.*, 2021), however advancements in therapy including the development of the monoclonal antibodies, targeted therapies aimed at the HER-2 receptors, have improved survival (Loibl and Gianni, 2017). Tumours lacking expression of any of the receptors, oestrogen, progesterone, or HER-2 are termed triple negative; the absence of receptors renders hormonal manipulation ineffective, restricting treatment options to chemotherapy, radiotherapy, or targeted interventions, consequently prognosis is generally significantly poorer than oestrogen receptor positive type (Jerusalem *et al.*, 2016).

2.2.4 Breast Cancer Detection

Screening proves efficacious in the early detection of all categories of breast cancer (Godley *et al.*, 2017). The WHO advocate for the provision of screening for women aged 50 to 69 years using mammography, supplemented by ultrasound or magnetic resonance imaging (MRI) on a biennial basis (WHO, 2014, pg27). The UK Screening Committee recommend screening be offered every three years between ages 50 and 70, followed by optional self-referral beyond age 70 (Godley *et al.*, 2017). A 2019 audit of presentation pathways to one cancer centre in the UK indicated 43.8% of referrals were prompted by the detection of a suspicious lesion on a screening mammogram, whereas the remainder (56.2%) resulted from direct presentation to a healthcare professional (Borsky *et al.*, 2022), due to development of palpable lumps, skin alteration, nipple inversion or discharge which may have alerted the woman to the presence of potential breast disease (Harmer, 2016). Although this study is limited in scope, focussing on a single cancer centre, it does highlight the importance of

mammography as an invaluable modality for identifying early stage tumours prior to them becoming palpable (Godley *et al.*, 2017).

The question of whether breast screening should be extended to include younger women has been the subject of debate for many years. A UK focussed, recently published longitudinal study, spanning more than two decades, revealed yearly screening from the age of 40 significantly impacted cancer mortality rates after 10 years. As a result, Duffy and colleagues., (2020) suggest lowering the age screening is commenced to 40, the age recommended by the WHO. However, this must be weighed against the risks of false positives, over-diagnosis, cost, and the expected adoption of any expansion of the service (WHO, 2014, pg.29). Currently the UK National Screening Committee (NSC) do not advocate for universal extension of screening eligibility, recommending screening at an earlier age be considered on individual risk assessment basis, and for those with a genetic predisposition (Godley *et al.*, 2017)

2.2.5 Breast cancer therapeutics

Following referral through primary care or via mammographic or MRI evaluation, a woman will typically be reviewed at a breast clinic. Here the mass is assessed, through a combination of breast imaging and ultrasound guided biopsy, and an individualised treatment plan devised (Ades *et al.*, 2017). Whilst every woman's cancer care trajectory is different it will generally include a combination of surgical intervention, chemotherapy, radiotherapy, and long-term use of hormone modifiers. Contemporary cancer treatment is personalised, specific to the needs of the individual, the stage, grade and extent of the disease and any co-morbidities experienced by the person (Harris *et al.*, 2018). Surgery is normally the primary treatment for breast cancer and may include mastectomy or lumpectomy with or without nodal excision, whilst radiotherapy and chemotherapy are offered prophylactically (*ibid*, 2018).

2.2.6 Potential symptoms experienced during the cancer trajectory.

Whilst there is not a distinct list of symptoms every person with breast cancer experiences and often before diagnosis there are no signs of disease (Harmer, 2016) . Denieffe and Gooney's, (2011) meta-synthesis, based on an analysis of thirty-one studies, determined a set of twelve commonly reported symptoms. These symptoms may arise independently or be influenced by surgical interventions, systemic anti-cancer therapies (SACT), including chemotherapy, immunotherapy, and hormone therapy or radiotherapy. It is important to note not all women will encounter these symptoms, their occurrence is in many cases treatment dependent, however throughout the course of the cancer

experience, these symptoms have been recognised as being most concerning and distressing for women with breast cancer.

The identified symptoms are:

Pain, fatigue, anxiety, depression, hair loss, skin changes, weight gain, nausea and vomiting, smell and taste changes, changes to eating and drinking, sexual problems and menopause or fertility problems
(Denieffe and Gooney, 2011)

Analysis of the systematic review revealed all symptoms had a multi-faceted dimensional influence on wellbeing; women in the study did not deem it helpful to classify the symptoms into discrete physical or psychological domains (*ibid*, 2011), highlighting the intricate interaction between these dimensions and their overall impact upon any distress experienced.

2.2.7 Summary

From a UK perspective breast cancer remains the most prevalent cancer in the UK in women, accounting for up to 55,000 cases per annum (CRUK, 2024). Despite this high and increasing incidence of breast cancer, a trend anticipated to persist, the mortality rate has significantly declined over the last four decades (Wojtyla *et al.*, 2021). It is hypothesised this downward shift this will continue, driven by heightened awareness of the carcinogenic effects of diet, alcohol and sedentary lifestyles, coupled with a decrease in the use of oestrogen stimulating HRT (Anderson *et al.*, 2021). However, it is projected the proportion of oestrogen positive tumours may increase; whilst this raises concerns, the oestrogen status does provide viable treatment options (Shagufta and Ahmad, 2018), and ongoing advancements in therapeutic modalities offer promising prospects for improved outcomes (Ades *et al.*, 2017).

In combination with new technologies facilitating earlier detection and implementation of strategies aimed at reducing modifiable risk factors, there is hopeful anticipation for both the sustained decrease in mortality rate and the prospective decline in incidence of breast cancer (with the exception of the expected increase due to population aging) (Sung *et al.*, 2021); however, with the increasing cohort of breast cancer survivors, Arnold and colleagues., (2022) posit there is a compelling argument for focus to be shifted from not only the prolonging of life, but also to enhancing overall wellbeing for those navigating life with and beyond breast cancer, advocating quality of life indicators in conjunction with survival data be reported as a preferred approach. With this objective in mind, the current thesis aims to investigate the influence of the pet dog relationship on the enhancement of quality of life, through examination of the multifaceted interactions between women who serve

as dog-guardians, and their experiences of living with breast cancer, and will next consider the impact of the cancer related distress on the woman.

There are many factors associated with increased survival, including novel and innovative treatment methods, better population screening technologies and the development of new and less toxic chemotherapy regimens (NHS England, 2016). Taking this into context, it is right quality of life and the survivorship agenda is now a subject in itself, one that tends to come under the umbrella of psychosocial oncology or psycho-oncology (Holland, 2002)

2.3 Psycho- oncology

Psycho-oncology, an “interprofessional discipline” (Lang-Rollin and Berberich, 2018) incorporating psychology focussing upon the mental and emotional wellbeing of people with cancer (British Psychosocial Oncology Society, 2019), was only recognised as an important component of cancer care in the late nineteen eighties (*ibid*, 2019), as a result of The World Cancer Declaration, a statement of aim from the International Union for Cancer Control (IUCC). A group of more than 1000 cancer experts representing and reporting from 113 countries, who collectively stated “universal availability of pain control and distress management” should be available for all with cancer (IUCC, 2016). This was in response to a call from the International Psycho-Oncology Society (IPOS) led by Holland (Holland, 2015), petitioning for cancer associated distress to be universally recognised and treated (Bultz, 2016).

2.3.1 Cancer related distress

Distress stems from a recognition or failure to cope with a threatening situation. This can lead to an extreme or persistent state of stress or exhaustion (Fink, 2009, pg. 3), as outlined in Selye's (1950) seminal paper in which he presented his “General Adaption Syndrome” a process whereby the body responds to stress by first going into a state of “alarm”, considered the fight or flight mode, as identified by Cannon in 1932 (McCarty, 2016), then into “resistance” whereby the body attempts to adapt to the stressor, before entering the state of “exhaustion” (Selye, 1950). Representing the culmination of reactions that occur due to prolonged exposure to a stressor, which Selye identified could be a range of factors including biological, chemical, psychological, environmental, or social, any phenomenon that tests the adaptive capability of the individual (Monroe and Slavich, 2016), resulting in the body's diminished ability to maintain its internal balance or homeostasis (Kirk. et al., 2014, pg. 29). Selye determined that signals sent via neural pathways could bring about changes to re-align the body systems a process known as allostasis (Fink, 2016).

Cancer associated psychological distress is considered as a spectrum disorder, with despondency and worry being at the lower end through to severely incapacitating difficulties comprising of anxiety, depression, and crises; an uncomfortable feeling characterised by changes to emotional wellbeing associated with social, spiritual and psychological (behavioural or cognitive) effects, impacting upon how a person copes with their illness and treatment (Schuurhuizen *et al.*, 2015). Gundelach & Henry, (2016) acknowledge that whilst cancer does affect holistic wellbeing, there is little evidence to attribute distress specifically to the disease or explain why distress associated with cancer would differ from distress associated with other illnesses, although some confer there are differences as a diagnosis of cancer may raise concerns around mortality, fear of recurrence (FOR) (Tran *et al.*, 2022) and the impact of treatments on body image (Kang *et al.*, 2018).

2.3.2 Psycho-social support provision in the UK

Provision of psycho-oncology services within each of the 62 UK cancer centres (an environment which brings together a range of services including surgery, SACT, pathology and radiotherapy, all of which have been deemed essential for the effective multiprofessional care of people with cancer (IAEA & WHO, 2022) is a mandatory requirement (Grassi and Watson, 2024). The cancer centre status being contingent upon the provision of “a nominated mental health professional” (Grassi and Watson, 2024), this can include a range of professionals not specifically a clinical psychologist; as funding is generally on a local basis this provision is variable across the country (Travado *et al.*, 2017). However, a recent international survey incorporating 43 countries identified most psycho-oncology services (70%) had involvement of psychologists, in conjunction with staff from other disciplines including “psychiatrists, nurses, physicians, pastors, priests or chaplains, counsellors and volunteers” (Grassi and Watson, 2024). Whilst in the UK, unlike other European Countries, Germany being an example, there is no nationally recognised qualification or specific accreditation scheme required to work in psycho-oncology, or be a provider of a service (Grassi and Watson, 2024). On a local basis there is an expectation all professionals involved in the delivery of psychological services will have completed some additional training relative to the level of service they provide, hence, those reviewing assessments and determining whether an individual has distress in the UK is often a clinical nurse specialist (CNS) who has received additional training including advanced communication skills (Wilkinson and Roberts, 2010), and “core clinical skills in psychological intervention” in addition to specific guidance about use of the NICE, (2004) model to determine need, referral and signposting (Thames Valley Alliance & Macmillan Cancer Support, 2023, pg. 23).

2.3.3 Assessment of distress

Cancer related distress is typically assessed via a distress screening tool; there are at least fifteen different scales in use throughout the world, some of the most frequently used tools include the Hospital Anxiety Scale (HADS) which Mitchell and colleagues, (2010) suggest whilst useful, is not effective when employed independently to detect cancer related psychopathology, The Distress Thermometer (Holland and Bultz, 2007) , The Functional Assessment of Cancer Therapy General (FACT-G) (Cella *et al.*, 1993), the Cancer Needs Distress Inventory (Lowery *et al.*, 2012) and the Symptom Distress Scale (Stapleton *et al.*, 2016). Some of these instruments may also be considered Quality of life assessment tools. The World Health Organisation (WHO) define quality of life (QOL) as “an individual’s position in life in the context of the culture and value systems in which they live and in relation to their goals”, and regard holistic needs as social, spiritual, and psychological factors which impact upon a person’s quality of life (WHO, 2014a). When considering wellbeing in relation to cancer QOL is often assessed (Gibbons *et al.*, 2016), there are a range instruments specifically designed to quantify QOL. One of the most frequently utilised is the WHO QOL tool (WHO, 2014a) which can be deployed in many different contexts, also with a range of populations including cancer cohorts (Ávila *et al.*, 2015; Binotto *et al.*, 2017). Another is the FACT-B (Cella *et al.*, 1993; Brady *et al.*, 1997), the instrument employed within the current research; this scale was developed specifically for analysis of QOL in breast cancer populations, to date it has been employed in at least sixteen published studies.

Common to all these tools is the dilemma as to when to execute the screening, who undertakes it, where it is conducted and the implications of the outcome; as has been identified worldwide, there is much variation as to the composition of the psycho-oncology team with no universal agreement as to the professional requirements of membership (Grassi and Watson, 2024). Mitchell and colleagues., (2012) examined the use of a distress screening tool within an oncology department to ascertain opinions on its usefulness from a range of professionals who instigated the screening; in 43% of the cases assessed, the screening tool was seen as helpful by the staff, in the remainder of occurrences it was either classed as not helpful or classified as neutral in terms of use. In addition, Pollak and colleagues, (2007) and Taylor and colleagues, (2011) determined in most instances it was not the doctors that started the conversations, the patients raising concerns often led to an assessment being initiated. However, the success of all these assessment tools is predicated upon the availability of the specialist services that provide the interventions to support those diagnosed with distress and enable those affected to regain some sense of normality and control, the outcome being an improved quality of life. In the UK, need is generally assessed through a holistic needs assessment, incorporating a concerns checklist, a modified version of the CPC (Bultz *et al.*, 2011) produced by Macmillan Cancer Support, a symptom monitoring report, the PHQ-9 depression scale

(Kroenke *et al.*, 2001), or HADS (Zigmond and Snaith, 1983) and the DT (Holland and Bultz, 2007) (Thames Valley Alliance & Macmillan Cancer Support, 2023, pg. 47-49). Should the CNS or other designated professional detect distress within the patient they may then provide support, information or refer to a level 3 service.

2.3.4 Prevalence of cancer related distress

As identified in the introduction, there is no consensus about the prevalence of cancer related distress, some suggest it may affect 30 to 40 percent of cancer patients (Mitchell *et al.*, 2011) or as many as 63.8% (Carlson *et al.*, 2019), with the figures associated with breast cancer falling between 46.0% (Carlson *et al.*, 2019) and 62% (Sun *et al.*, 2022) as determined using a DT $\geq$ 4 (equivalent to level 1 on the NICE, (2004) framework), and between 45% (Sun *et al.*, 2022) and 51.8% (Carlson *et al.*, 2019) for DT $\geq$ 5 (equivalent to level 2 on the NICE, (2004) framework) which should initiate support from a “health or social care professional with additional expertise” (NICE, 2004, pg. 78), usually a CNS or Allied Health Professional. Level 3 and 4 distress which incorporates a diagnosis of a psychopathology is managed by a “trained and accredited professional” (level 3) (NICE, 2004, pg. 78) or “mental health professional” (level 4) (*ibid*, pg. 78), and is present in approximately 33% of those with cancer (Nakash *et al.*, 2014), however Mitchell and colleagues, (2011) in an earlier study suggested incidence is generally over estimated, their systematic review gathering retrospective data from 70 studies, incorporating data from 14 different countries and 10,071 people, identified anxiety in 10.3% of the cohort, adjustment disorder in 19.4%, and depression in 16.3%, as based upon the DSM (Diagnostic and Statistical Manual) of mental disorders or ICD (International Classification of Diseases) criteria, resulting in an overall incidence of mood disorder of 30 to 40 percent. Whereas Ernst and colleagues, (2021) in their study of 4020 individuals with a range of cancers, identified 22.9% of those with a mental disorder scored DT $\geq$ 5, however there were also 10% of the cohort with a psychopathology who scored DT $<$ 5, indicating the challenges with employing a tool to assess distress.

2.3.5 Identifying cohorts at risk of cancer related distress

In conjunction with the difficulty in accurately quantifying the incidence of distress due to there being no consensus as to the preferred distress scale or measure of accuracy of the scales (Ernst *et al.*, 2021) and recognition that the needs of someone with cancer particularly breast cancer, often associated with a long survival period, will vary throughout the course of the disease, has resulted in attempts to try and identify distress risk within specific cohorts of cancer patients, to enable appropriate interventions in a timely manner; thereby, preventing the patient from spiralling into a

deeper depression or a more severe state of distress, leading to a reduced quality of life, hence, potentially reducing the likelihood of a vicious circle, whereby depression leads to a reduced quality of life, and consequently a diminished quality of life results in more depression (Ahn *et al.*, 2015). If it is possible to identify common factors that are associated with whether a person with cancer is affected or not by psychological distress (Markovitz *et al.*, 2015), and solutions be offered prior to unmet needs becoming unsurmountable difficulties, then it may be possible to prevent a person from developing cancer related distress or requiring psychological intervention, hence, services may be targeted to the areas of greatest need.

Further to identifying overall distress associated with cancer, studies focussed upon the identification of specific factors contingent with a higher prevalence of cancer related distress, assessed using a variety of tools including the DT, the HADS, the PL and the Brief Symptom Inventory (BSI), have identified the following aspects may potentially impact on overall distress experienced. Each study was non-cancer specific, however included a cohort of breast cancer patients, therefore where applicable the results in relation to breast cancer are considered.

In the Giese-Davis and colleagues., (2012) study which encompassed all types of cancer and a range of age groups, younger females were found to be more susceptible to cancer related distress and reported a higher number of unmet needs, it was hypothesised this was associated with a greater likelihood of experiencing financial challenges and childcare responsibilities. Whilst these may appear as practical problems they may result in psychological implications, manifesting as worry for others (Renna *et al.*, 2021), sleep disturbances (Lowery-Allison *et al.*, 2018), feeling burdensome (Cardoso *et al.*, 2016) and ultimately impacting coping ability (Browall *et al.*, 2016). Conversely Clark and colleagues., (2017) found younger males exhibited higher levels of distress compared to younger females; however, females reported a greater number of unmet needs, the most prevalent being associated with fertility, which may be impacted by surgical alternatives, and SACT options (Speller *et al.*, 2019), females also presented more emotion related concerns. Whilst Admiraal and colleagues., (2013) who assessed distress in a mixed cohort of 1353 participants, discovered younger females, particularly those with young or adolescent children, displayed higher levels of distress.

Within a cohort of 9000 participants encompassing thirteen cancer types, 27.8% were diagnosed with breast cancer, of these 32.8% experienced clinically recordable distress (as evidenced using the BSI) (Zabora *et al.*, 2001). This was comparable to the other cancer sites, where prevalence ranged from 29.6% to 43.4%. Pancreatic cancer was associated with the highest levels of both depression and anxiety, those with lung cancer exhibited the highest level of distress. Distress in the breast cancer cohort was not observed to be greater than other cancers and significantly lower than lung and

pancreatic, suggesting the association between cancer type and distress remains unsubstantiated. Similarly, Admiraal and colleagues., (2013) noted minimal difference in distress between cancer types. Prostate cancer had the lowest prevalence of distress (26.5%), whilst breast cancer, the majority of participants (575), was higher (42.7%), though not significantly different from other cancer types, including lung at 45.9%.

A significant difference was observed in relation to treatment complexity; those receiving combined modality treatment, potentially more intensive and associated with a broader range of side effects, experienced greater distress, compared to those receiving single modality treatment (excluding surgery) Admiraal and colleagues., (2013). Breast cancer typically involves surgery followed by radiotherapy or SACT (Łukasiewicz *et al.*, 2021), consequently due to the combined approach, women with breast cancer may be more prone to experiencing distress.

Further studies have examined the impact of other factors including race. A retrospective study utilising data gathered through the DT and PL, revealed whilst African Americans did not report higher levels of distress they did identify distinct priorities of need, highlighting a greater range of practical concerns compared to the Caucasian cohort (McDonagh *et al.*, 2018), whilst women with breast cancer residing in rural areas experienced higher levels of distress and had additional unmet needs compared to those living in more densely populated locations (Eggins *et al.*, 2022).

These studies illustrate the challenges of trying to categorise and establish programmes for specific populations based upon identified unmet needs. There is a plethora of variables which may impact upon wellbeing, this has led to the recognition that the optimal strategy involves identification of individual levels of distress and needs, to enable the targeting of psychological services to those with greatest need, as determined by the DT or another validated scale (Fallowfield *et al.*, 2021). This personalised intervention approach is more likely to be effective compared to population wide initiatives which may incur substantial costs and could prove ineffective (Zabora *et al.*, 2001; Fallowfield and Jenkins, 2014; Dekker *et al.*, 2020; van Maaren *et al.*, 2024). This has led to the development of the current process based upon the NICE, (2004) guidance employed within the UK and now incorporated within the UK National Cancer Plan (Grassi and Watson, 2024).

2.3.6 Distress and coping

There are, a significant proportion of women with breast cancer who have identified distress who receive minimal support and are expected to draw upon the resources around them to manage their stress and enable their coping. Every woman with breast cancer will react differently to a diagnosis;

it is not possible to say that a person's reactions are normal or abnormal, or classify them as good or bad, each reaction should be considered in respect of the individual within the context at the time. It should also be appreciated responses are transient and will be different at different points in the disease and care trajectory, influenced by both intrinsic and extrinsic factors (Barracough, 1999). These intrinsic and extrinsic factors will strongly influence whether a woman with breast cancer will have unmet needs and how they cope.

Coping, or how the body adapts or copes with stress (Lazarus and Folkman, 1984, pg. 14-15), became a focus of attention in the nineteen eighties when it was acknowledged complete control over stress was not always attainable (Lazarus and Folkman, 1984, pg. 14-17). Prior to this eminent physiologists, including Bernard (1859), Cannon (1932), and Selye (1936) (Kirk. et al., 2014, pg. 23-29) dedicated their efforts to studying the manifestation of stress and its effects on the human body (Fink, 2016), in an attempt identify the cause of stress.

Theories of coping, originating from Freud's research on ego defence mechanisms (Maricutoiu and Crasovan, 2016), now known as "involuntary coping mechanisms" (Vaillant, 2011) have evolved and gained recognition as an explanation for various ways people respond when faced with challenges beyond their usual comfort level. Sigmund Freud (1923, 1926 cited in Cramer & College, 2015) laid the groundwork for these initial theories on defence mechanisms, his studies became part of what was later known as his Psychoanalytic Theory of Personality (Kerberg and Aligor, 2005, pg. 117) These theories were further developed and re-detailed by his daughter, Anna Freud (Cramer & College, 2015). Sigmund Freud defined defence mechanisms as "unconscious processes that help the ego deal with external and internal threats that produce anxiety" (Cramer 2000), anxiety inducing processes being stress. Through laboratory-based observations involving adults with psychopathologies, the ego defence model, which is often illustrated as seven main psychological defence mechanisms described by Freud, was proposed (Baumeister *et al.*, 1998) Anna Freud later made additions to this theory proposing a taxonomy, however, her list of defences was excessive, based upon psych anomalies, and lacked applicability to the real world (*ibid*, 1998).

Vaillant's Adaptation to Life theory published in 1977 (Vaillant, 1998, pg.75) was the first workable taxonomy or hierarchy. Vaillant suggested defence mechanisms could be grouped into four categories based upon age and maturation. The first level being psychotic defences, sometimes termed primitive or maladaptive, may include "psychotic denial" and "psychotic delusion", the next level are immature defences also thought of as being maladaptive, for example "fantasy," "acting out" or "passive aggression", the third level is neurotic or intermediate defences including "displacement", "isolation", and "repression", the highest level (fourth level) mature defences such

as “sublimation”, “suppression” and “humour” which are sometimes subsumed into adaptive processes (Vaillant, 2011). Whilst aspects of the theory remain relevant, and some of the original terms to describe defence processes are still in use, and certainly until 2013 when the fifth edition was published, 30 of them were included within in the DSM IV (American Psychiatric Association, 1994, Cramer, 2000), current thinking deems these theories simplistic as they fail to consider the individual’s factors influencing reactions to stressors (Lazarus and Folkman, 1984, pg.64).

Recognising that stress is an inevitable component of life, often beyond an individual's control, contemporary psychologists have tended to concentrate upon how individuals cope with such situations rather than solely on the events themselves (Lazarus and Folkman, 1984, pg. 14-15). Whilst it may be valuable to explore the origins of certain reactions and whether they originated from childhood, labelling them as "adaptive" or "maladaptive" can be detrimental. It is now acknowledged mechanisms previously considered maladaptive, or immature, may prove constructive in certain situations and serve as stepping-stones toward developing more adaptive strategies (Mercer, 2011), leading to the suggestion that all coping strategies should be considered transient.

Lazarus and Folkman, (1984, pg.76) subsequently defined coping as “constantly changing cognitive and behavioural efforts to manage specific internal and external demands that are appraised as taxing or exceeding the resources of the person”, emphasising the significance of appraisal by the individual as key to successfully managing internal and external demands of a situation; believing coping to be dynamic, and reliant on the appraisal or evaluation of an event, leading to a subconscious categorisation of the situation into harm or loss, threat, or challenge (Lazarus and Folkman, 1984, pg. 26-27). In some cases, these states may co-occur but are associated with different physiological responses.

The result of this cognitive appraisal is dependent on various factors, these include commitment (which refers to the value or importance a person places on the event or situation), personal beliefs related to control, and situational factors associated with the novelty of the event (*ibid*, 1984, pg. 47-50). Additionally, constant re-appraisal plays a crucial role in enabling an individual to effectively handle a complex and stressful situation. This involves a combination of maintaining control over the situation and making adjustments as needed. Lazarus and Folkman, (1984, pg. 131-164) identify these coping responses in their Transactional Model of Stress and Coping as primary appraisal, secondary appraisal followed by managing the situation through emotional or problem focused coping mechanisms.

Emotional coping is thought to be manifested when appraisal has indicated a person's environmental modifications are not feasible and hence there is a sense of acceptance (Lazarus and Folkman, 1984), whereas problem focused coping involves both inward and outward strategies. Inward focusing entails self-transformative processes, while outward focused coping necessitates adapting and dealing with environmental challenges or barriers (Lazarus and Folkman, 1984). Further research by Folkman, (1997) (Folkman, 2008) investigating the reactions to caring for someone dying of AIDS (acquired immunodeficiency syndrome) paved the way for her to refine the categorisation of coping strategies within the Concept of Coping Theory (Lazarus and Folkman, 1984) expanding the classification to include meaning-focused coping, in recognition an individual could experience both positive and negative states of mind during a prolonged stressful episode, employ both problem-focused and emotion-focused coping, and still through re-appraisal of beliefs', values and existential goals find meaning to the event (Folkman and Moskowitz, 2004; Folkman, 2008).

Lazarus and Folkman, (1984, pg.71) also attempted to explain the difference between coping and defence mechanisms, coping being a conscious process that is only used when automatic behaviours (defence mechanisms) are not effective or have not yet been learned. However, subsequent scholars have raised doubts about the simplicity of this definition. Cramer, (2000) suggested further categorisation, which included consideration as to whether the strategy is intentional or not, is or is not associated with pathology, and whether it is situation dependent. Additionally, Miceli and Castelfranchi, (2001) proposed further additions, that of manipulation and revision, suggesting that avoidance of a negative effect achieved through an unconscious manipulation or alteration of a mental state should be considered a defence mechanism, whereas a conscious revision or alteration of a mental attitude due to the rejection of a particular mental representation should be classified as coping. They further argue that the term "emotion-focused coping" is not accurate, as it encompasses defensive processes, which according to their understanding of Lazarus and Folkman's (1984) definition of coping, would only be initiated when cognitive appraisal results in the acceptance of a situation (*ibid*, 2001).

Subsequent researchers have endeavoured to define and categorise various coping strategies, resulting in the identification of over four hundred such mechanisms (Maricutoiu and Crasovan, 2016). It is however important to acknowledge many of these later terms share very similar definitions to those of earlier psychological theories, and as a result, they are likely to be the same or similar to those previously identified. As noted by Baumeister, Dale, & Sommer (1998, p. 1116), there have been numerous attempts over the years to "relabel and rediscover" different cognitive processes.

In an attempt to simplify categorisation and increase the feasibility of comparative studies Skinner and colleagues, (2003) presented a comprehensive classification of coping strategies. They gathered evidence and data from 100 studies conducted over a 20-year period. Through meticulous analysis of the studies which used inductive and deductive methodologies, and hierarchical tools to assess coping skills, they formulated a framework consisting of 12 distinct "families of coping".

The framework included

- Problem solving*
- Information seeking*
- Helplessness*
- Escape (including avoidance, denial and wishful thinking)*
- Self-reliance (including emotional and behavioural regulation and emotional expression)*
- Support seeking (contact and comfort seeking and spiritual support)*
- Delegation (seen as maladaptive help seeking)*
- Isolation*
- Accommodation (including distraction, cognitive restructuring, and acceptance)*
- Negotiation (including bargaining and priority setting)*
- Submission (including rumination and intrusive thoughts)*
- Opposition (including projection, aggression and blame of others)*

Initially, their intention was to establish a hierarchical arrangement of coping strategies. However, due to a lack of consensus on the taxonomy's structure, they suggested additional studies and more systematic reviews should be conducted, therefore coping continues to be the focus of much debate.

It can also be seen from Skinner's model (Skinner *et al.*, 2003) many of the coping mechanisms involve drawing upon the resources around the individual, for example in the provision of information, comfort, distraction or problem solving, and whilst emotional concerns frequently mediate the total distress associated with a breast cancer diagnosis, social factors may be considered in conjunction with emotional elements as they also contribute to the psychosocial deficits responsible for the overall distress experienced (Wei *et al.*, 2016), therefore, in assessing a woman's needs not only psychological needs should be assessed but those of a social focus too, as they will also impact upon a woman's ability to cope,

2.3.7 Social needs

Social needs are those needs met by having a good network of friends or access to services which can provide assistance (both practical and emotional) when required (Fong *et al.*, 2017). These needs span the social, practical, physical, and spiritual domains of life (Bultz *et al.*, 2011). In their assessment of distress in a cohort of 10,734 breast cancer patients using the Canadian Problem Checklist (CPC), a tool that emerged from research by Bultz and colleagues., (2011) following recognition of distress as

the 6th vital sign of cancer by the UICC and IPOS (Holland et al., 2011) and a need to assess cancer related distress as part of measures of wellbeing (Luzia Travado *et al.*, 2017). Naik and colleagues., (2020) established those younger participants (aged 18-39 years) and an older cohort (39 years above), prioritised their needs in differing order, with social needs being rated as the third priority for the 39 years plus group, and fourth priority for the younger respondents. Whilst physical needs were rated as more important than social needs for both groups, practical needs were considered more pressing for the younger patients (Naik *et al.*, 2020), practical needs being those associated with “work, finance, appointments and accommodation” (Bultz and colleagues., 2011), this is perhaps not surprising as younger adults are more likely to be in employment and in the early stages of relationships or parenthood.

Physical aspects, which in the combined cohort ranked as the second most prevalent unmet need (with 54.2% of the Canadian respondents citing it as a factor), included “sleep difficulties, weight loss or gain, and cognitive issues” (Naik *et al.*, 2020). In the UK concerns about physical manifestations are typically evaluated and addressed during routine medical follow-up appointments, through assessment of activities of living (Roper *et al.*, 2001), a process which serves as the foundation of many UK patient assessment techniques (Curtin *et al.*, 2021), consequently, are generally addressed as part of follow-up care or within general practice. Therefore, whilst physical unmet needs are acknowledged as contributing to overall distress experienced, social and practical needs form the focus of the following discussion.

Social needs, thought to directly correlate with health-related quality of life (Hastert et al., 2021), are the requirements which must be fulfilled to enable the social determinants of health (as determined by the WHO), to be achieved (Goel *et al.*, 2024). In regard to breast cancer these needs often encompass experiences associated with loneliness and isolation, perception of being burdensome and worry about family and relationships (Bultz et al., 2011). Drawing upon the CPC framework (Bultz *et al.*, 2011), Naik and colleagues., (2020) revealed 25.1% worried about their family and friends, 16.1% considered themselves a burden and 10.4% of women felt isolated. Each of these aspects of social impacts will now be examined.

Worry about others was the most frequently identified area of concern within the social domain of the CPC, in both the younger and older cancer cohort (Naik *et al.*, 2020); this may manifest for the woman as a need to shield others from the reality of their situation, for example, where women are deliberating about whether to disclose their diagnosis to their school age children (Asbury *et al.*, 2014). Reasons for adopting a protective approach include the perception the child may struggle to understand what they are being told, the potential stress the disclosure can cause the child (Asbury

et al., 2014), concern the child may inadvertently disclose the diagnosis to others, guilt, shame, reluctance to alert a child to the potential of a genetic association of the disease, and the desire to maintain self-efficacy through independence, thus not burden a child emotionally or physically (Yoshida *et al.*, 2010). In circumventing any distress to their children, women may adopt a range of strategies including maintaining normality by continuing to complete everyday tasks, restricting information disclosed to children (Mosher *et al.*, 2013), concealing evidence of physical effects such as scars or hair loss, and trying to remain stoical and positive in their presence (Asbury *et al.*, 2014).

Similarly, concerns regarding potential reactions to “bad news” can pose a dilemma, impacting the decision about divulging a diagnosis to significant others (Beatty *et al.*, 2008). Women may worry that friends and family will become distressed at hearing the news, hence, will become the ones requiring the support, moreover significant others may be incapable or unwilling to offer support (Halkett *et al.*, 2007). This dynamic may extend to the workplace; colleagues could react in a similar way. Alternatively, women may perceive supervisors or managers lack empathy, believing disclosure may perpetuate concerns around job insecurity (Robinson *et al.*, 2015).

Being perceived as a burden was the second most pressing social concern for both the younger and older cohort in the Naik and colleagues., (2020) study. This sense of burden may arise from various factors, including concern about imposing emotional strain on partners or caregivers, especially children, (Yoshida *et al.*, 2010), having to manage their own reactions to their loved one’s response to the diagnosis, or future uncertainties (Beatty *et al.*, 2008), or may be attributed to physical effects of the disease, rendering the woman unable to fulfil customary household duties, such as shopping, meal preparation, cleaning, childcare or eldercare, thus necessitating reliance on external assistance during this period (Yoo *et al.*, 2010; Mosher *et al.*, 2013;). This is particularly salient for those with advanced disease who may experience a permanent change in roles and responsibilities (Cardoso *et al.*, 2016). Whilst those with earlier stage disease often experience a temporary suspension in “normal” household tasks and obligations due to time taken to attend hospital appointments, or as a result of side effect related illness (Beatty *et al.*, 2008). Expanding this concern to the workplace, Robinson and colleagues, (2015) discovered those with breast cancer expressed concerns their fellow employees may perceive them as adding to their workload, whilst covering for their absence. In some circumstances this concern about being seen as a burden was so concerning to the women they avoided disclosure of their diagnosis (Yoo *et al.*, 2010; Yoshida *et al.*, 2010), choosing to maintain self-efficacy and minimise distress experienced by others.

Social isolation, the third priority, identified as a “lack or absence of social contact or relationships” (Newall and Menec, 2020), may arise due to the individual’s withdrawal from interaction, precipitated

by side effects of treatment such as fatigue or sickness, be a result of emotional concerns surrounding perceptions of alteration to body image (Vilhauer, 2008), or the perceived obligation to discuss diagnosis (Robinson *et al.*, 2015), equally ostracization due to others' discomfort with the situation may result (Vilhauer, 2008); friends or colleagues may not know what to say (Mosher *et al.*, 2013), fear causing distress, or possess their own insecurities (Beatty *et al.*, 2008; Vilhauer, 2008). Interestingly Adams and colleagues., (2017) demonstrated there was a direct relationship between loneliness, as measured using their "cancer loneliness scale", and the quantity of persons with whom they had contact, suggesting there existed a greater possibility of misinterpretation and perceived restriction on self-expression with a larger cohort of friends or family, conversely Kroenke and colleagues., (2012), discovered QOL increased when women were part of a wider social circle.

According to Cardoso and colleagues., (2016) loneliness becomes a significant area of concern for women contending with advanced breast cancer, these women being more prone to experiencing a pervasive sense of isolation, and a disconnection from those with earlier stages of disease. A relational shift is also noted to be more probable in advanced cancer due to alterations in roles (Beatty *et al.*, 2008), or having to relinquish employment due to the impact of the disease. Furthermore, it is crucial to consider age related implications, particularly regarding younger women who are often at a social disadvantage, given their pre-menopausal status at the time of diagnosis, therefore generally less favourable prognosis (Keegan *et al.*, 2012). Younger women may confront social and psychological challenges not only during the initial phases of the disease, when they are undergoing intensive treatment, but also have a greater probability of latterly experiencing isolation, worry and perceptions of being burdensome as the disease progresses (Davies and Sque, 2002). Whilst Beatty and colleagues, (2008) discovered the sense of loneliness increased in intensity when active treatment ended, this coincided not only with a sudden reduction in social interaction due to curtailment of hospital appointments, but patients also felt their colleagues and friends viewed the end of a course of treatment as a conclusion to the episode of the disease, a time to "get on with life"; the women however did not feel able to do this, concerned the cancer would continue to occupy their thoughts (Fong *et al.*, 2017).

Whilst all these social impacts may have a real and significant effect upon a breast cancer survivor, the severity of the impact will be related to how the unmet needs are viewed by the woman, and the psychological response to their situation (McGarry *et al.*, 2013). Consequently, although classified as social needs (Bultz *et al.*, 2011), failure to address these concerns could engender psychological distress (Dyson *et al.*, 2012), hence psychological and social needs cannot easily be divorced from one another and are typically evaluated in tandem as part of psychosocial assessment (Mitchell, 2014). Therefore, in the UK, it is standard practice in accordance with the NICE, (2004) guidelines, for all

women diagnosed with breast cancer to be offered a holistic needs assessment at some point during their initial treatment. Those with significant distress will be offered further support where necessary, from appropriately qualified mental health professionals, however approximately 50% of women with breast cancer (Mehnert *et al.*, 2018; Carlson *et al.*, 2019; Sun *et al.*, 2022), those with DT score of <5, will be encouraged to draw upon their own support systems, in conjunction with enhanced information provision and compassionate communication (Transforming Cancer Services Team, 2020).

2.4 The human-dog dyad

This source of support may be found in the form of a four-legged friend, or woman's companion dog, "a pet [dog] with no specialised employment training" (Howell *et al.*, 2022), who by virtue of its presence may offer companionship and assistance, the specific characteristics of which are likely to differ within each human-dog dyad, and are yet to be clearly determined, hence, the purpose of the current study.

The benefits of a dog in a therapy setting have long been recognised (Marcus, 2012). The first recorded interaction being in a mental health context in 1972 (Konnor, 2000), since then employment of therapy animals, now referred to as Animal Assisted Interventions (AAI), has significantly increased, attributable to the recognition of the positive impacts animals, specifically dogs, have on both physical and emotional wellbeing. For example, pain reduction has been demonstrated in several studies including that of Coakley and Mahoney, (2009) who demonstrated reduction in pain score between pre and post visits from a therapy dog to an inpatient unit. Similarly, in a qualitative study Engelman's, (2013) participants stated they experienced reduction in pain as a result of a dog visitation, whilst Bolden and colleagues, (2017) identified a significant decrease in pain score in patients with spinal cord damage, following four interactions with a therapy dog. Additionally, positive effects on cognitive function have been observed, for example, Moretti and colleagues, (2011) demonstrated significant improvement in mental state in patients with long-term mental health conditions, receiving a series of AAI's.

Over the past decade there has been a substantial increase in studies evaluating the impact of AAI in the context of cancer (Holder *et al.*, 2020), leading to identification of a wide range of impacts. Many are multifaceted, however, and include positive effects on "heart rate", "cortisol" levels, "blood pressure" and "oxygen saturation" (Holder *et al.*, 2020). Additionally, Fleishman and colleagues, (2015) demonstrated increased emotional wellbeing, as measured by the FACT-G scale (Cella *et al.*, 1993) in a cohort of 42 patients with head and neck cancer, interacting with a therapy dog whilst

attending a cancer centre for daily treatment. A significant reduction in stress and depression was observed within a cohort of children with leukaemia interacting with a therapy dog in an oncology outpatient clinic, over a four week period (Osório and Silva, 2017), and a cohort of children interacting independently with a therapy dog, demonstrated a significant decrease in “worry, tiredness, fear, sadness and pain” (Chubak *et al.*, 2017). Suggesting a dog in a therapy context may yield tangible benefits; however, to date, the majority of published studies in oncology have focused upon the role of therapy dogs, “an animal who is included into the work of a qualified health professional” (Howell *et al.*, 2022), rather than pet or companion dogs.

The bond between an owner and dog is unique, one frequently recognised in terms of strength and longevity (Morey, 2010). Dogs live for an average of 10 years (Proschowsky *et al.*, 2003), whilst it is acknowledged that this is not the case for all dogs, a guardian acquiring a dog from puppyhood could potentially share approximately 15% of their adult lives with the dog, fostering a significant and meaningful relationship over time. This human-dog relationship brings with it a sense of security, contentment, aspiration, and a need for one’s own survival (Fine, 2015, pg. 4). Many of these feelings are amplified in relation to disease, this was demonstrated by Brooks and colleagues, (2016) who asked a group of individuals diagnosed with long-term mental health conditions to, in response to the question “who or what do you think is most important to you in managing your mental health”, draw their social circles (these were concentric) indicating the position their pets occupied, the centre being the “core” of the social circle. Most participants, 60%, indicated their pets occupied the central position, a further 20% selected the middle circle, whilst 12% the outer circle (*ibid*, 2016). Participants cited their pets as providing the most reliable relationship, providing a level of closeness not available from anyone else within their psycho-social network (Brooks *et al.*, 2016), they referred to this as being ‘pet centric’; these networks conferred support conventional mental health human support systems were unable to provide and illustrate the importance individuals may attribute to their animals in a time of distress, although, it should be acknowledged those with stronger relationships with significant others were less inclined to rely on the relationship with their pets to the same extent (Brooks *et al.*, 2016).

In the UK in 2011, it was estimated there were approximately 9.4 million pet dogs (information derived from multiple sources including pet insurance data, vet registrations, microchip records and national survey) (Asher *et al.*, 2011). It is, however, acknowledged the true number may have ranged from 8.1 to 11.5 million. Based upon the number households in the UK in 2011 being estimated as being 25 million, a one dog per household ratio would indicate approximately 40 % of all households in the UK were dog guardians. More recently this is likely to have increased due to a substantial rise

in dog acquisition during the Covid pandemic, the current UK dog population estimate is 13 million (Anderson *et al.*, 2023).

Anthrozoology, the study of “the interactions and relationships between human and nonhuman animals” (Herzog, 2019), is a relatively new discipline, only gaining its status as a recognised academic subject in the late 1980s and early 1990s when the International Society for Anthrozoology (ISAZ) was established (Hart, 2017). Since then, there have been a wealth of studies examining the psychological, social, and physical benefits of the human-dog dyad, few have considered the relationship between dog and owner in respect to a long term or chronic condition, there is a particular sparsity when cancer is the long-term condition under consideration. The main comparative studies, those of Ingram and Cohen-Filipic, (2018); Nitkin and Buchanan, (2020); Trigg, (2021); Kogan and colleagues, (2023); Currin-McCulloch and colleagues, (2023), are discussed within the following sections. To the best of the researcher's knowledge none currently exist, which scrutinise specifically the role of companion dogs in relation to breast cancer, the commonest cancer in women. Published studies have mainly focused upon the association of the human-dog dyad and its impact on wellbeing and whilst being similar in nature to the phase I component of the current study, have not sought to establish the foundations of the relationship in the cancer context, therefore, to inform understanding of the potential benefits of the dog guardian relationship specifically in the context of breast cancer. The next section examines the assumed benefits of AAI within oncological settings (Holder *et al.*, 2020) whilst exploring the application of these theories specifically in relation to the companion dog and breast cancer.

2.4.1 Theories and mechanisms underpinning the therapeutic effects of dog interaction.

As a result of a systematic review, examining 32 articles concerning oncology specific AAI, of which 26 focussed solely upon AAI involving dogs, 2 only on horses and the remainder encompassing various animals including cats, dogs, horses, and rabbits, Holder and colleagues., (2020) established a framework illustrating the advantages of human-animal interaction for those experiencing cancer. The “multi layered benefit hypothesis of AAI in oncology” (Holder *et al.*, 2020), demonstrates the inter connectivity between the theories and processes of AAI, their influence on the neurobiological pathways, resulting in quantifiable physiological benefits, attributable to an enhanced quality of life.

Within this framework Holder and colleagues., (2020) identified five fundamental processes, or mechanisms, forming foundations of the benefits of oncology related animal interactions, “compatible animal personality, distraction and entertainment, movement, physical touch, and

increased human interaction” (Holder *et al.*, (2020) The following section will incorporate an analysis of each process, and a discussion of its relevance in the context of companion animal interaction, specifically with regard to canine guardianship for women with breast cancer.

2.4.2 Compatible animal personality

This process focuses upon the compatibility of the individual and animal (which for the scope of this discussion will be a dog), thus relies upon the quality of the relationship or strength of bond formed between dog and person (Menna *et al.*, 2019). The success of AAI is contingent upon whether the individual receiving the therapy finds the dog appealing or not, a dog which is boisterous or too docile, may be perceived as failing to meet the needs of the person experiencing the intervention (Miller *et al.*, 2022). However, as household pets, dogs are typically chosen by their caregivers following assessment of their suitability and ability to bond with the individual (Holland, 2019), hence, whilst compatibility is fundamental to “unlocking” the therapeutic potential of the relationship, regarding companion dogs it is posited this facet of the interaction is already established due to the pre-existing relationship between dog and guardian.

Whilst the nature and intensity of the bond (which can be evaluated via a range of empirical approaches, for example the MDORS (Dwyer *et al.*, 2006) or Lexington Attachment to Pets Scale (LAPS) (Johnson *et al.*, 1992), may impact upon the perceived benefit experienced by the guardian, especially their adaptation to the challenges posed by a cancer diagnosis, in many instances guardians maintain an established relationship with their canine companions (Kogan *et al.*, 2023), which despite being challenged by the cancer experience (Lopes-Conceição *et al.*, 2023), including factors such as fatigue, physical limitations, treatment side effects and financial constraints due to changes in personal circumstances, (Ingram and Cohen-Filipic, 2018) continue to bestow benefits throughout the cancer trajectory. Interestingly, in the context of breast cancer there is a notable increase in pet acquisition within five years of a cancer diagnosis (Lopes-Conceição *et al.*, 2023), possibly indicating a deliberate quest for companionship and support.

2.4.3 Distraction and entertainment

Distraction is recognised as one of the prime coping mechanisms employed by women with breast cancer (Browall *et al.*, 2016), particularly in regard to worries surrounding cancer recurrence or prognosis (Thewes *et al.*, 2016), and whilst distraction is often deemed a maladaptive coping strategy due to its association with avoidance behaviours (Carver and Scheier, 1989), contemporary

perspectives regard it more favourably, especially when combined with psychological therapies based upon problem solving or mindfulness (Sage *et al.*, 2008).

With AAI the potential for distraction is thought to be correlated with the novelty and entertainment value of the dog (Wagner *et al.*, 2022), serving as a temporary diversion away from the stress associated with a cancer diagnosis or treatment regime (Osório and Silva, 2017); it is this ability to interrupt, which renders the intervention successful. Laughter is recognised as a beneficial form of cognitive distraction and therapy in the management of breast cancer (Melton, 2016) , and whilst it is acknowledged dogs may offer entertainment and pleasure through observing their idiosyncratic behaviours when at play, the extent to which this contributes to the entirety of the distraction they provide is questionable. Distraction is a multi-faceted construct, potentially encompassing all of the senses; vision, olfaction, proprioception, hearing, vestibular changes and touch, which collectively influence alterations in cognition and behaviour (Babaie *et al.*, 2015). For the companion dog to serve as an effective distractor, it is suggested a range of senses beyond those affected by humour need to be positively impacted by the human-dog interaction.

Given the coping ability of the individual may depend upon the cumulative influence of the stressors encountered (Haight *et al.*, 2023) and the effectiveness of the person's coping mechanisms, the impact of dog-mediated distraction will be individual and differ for each dog-guardian. Furthermore, this variability will likely be contingent to some extent on the strength of the human-animal bond (Mills and Hall, 2014).

2.4.4 Movement

The third dimension pertains to movement, encompassing exercise and physical activity, a component of AAI which may be limited due to clinical constraints and practical feasibility (Kaminski *et al.*, 2002). Theories supporting the advantages of exercise and movement in oncology centre on activity increasing oxygen saturation (Holder *et al.*, 2020), thereby potentially enhancing the effectiveness of anticancer therapies. Furthermore, engaging in exercise with a canine companion may help to strengthen the bond between human and dog (Riddoch *et al.*, 2022), whilst also providing another avenue for distraction.

In relation to breast cancer two studies extol the virtues of a dog being a promoter of regular activity, a lifestyle change cited as being a factor implicated in the reduction of tumour recurrence (Pudkasam *et al.*, 2017). The first, a comparison between dog guardians and non- dog guardians diagnosed with a range of cancers, including breast carcinoma, with 76 of the 741 respondents completing the postal questionnaire, revealed, contrary to expected findings, the only individuals who reported higher levels of physical activity compared to the non-dog-guardians, were those with breast cancer; this was typically light exercise, approximately 60 minutes extra physical engagement a week. It was suggested others walking the dog, a switch to lower intensity activities and the season in which the study was conducted, may account for the lack of difference observed (Forbes *et al.*, 2016). Whilst Binotto and colleagues, (2017) determined women with breast cancer participating in self-selected leisure activities, including exercise, experienced higher levels of quality of life (74.7 versus 65.1), as measured with the WHO QOL- Bref, suggesting leisure pursuits may contribute to wellbeing. Pet guardianship also correlated with wellness (72.4 versus 67.2). Unfortunately, this study did not report the correlation between, activity, pet guardianship and QOL, only the separate factors, limiting the conclusions that may be drawn.

2.4.5 Touch

The fourth mechanism is associated with the therapeutic effect of touch, which, beyond potentially conferring a range of neurobiological benefits (Morrison, 2016) may also be regarded as a mode of distraction involving proprioception (Bascour-Sandoval *et al.*, 2019). Touch as mediated through the physical movement of hands may be considered distraction, as it involves activation of neural pathways to enable the motion to occur (Borroni and Baldissera, 2008). Conscious engagement in a manual activity, for example knitting, may serve as an effective distraction since it demands voluntary control to initiate and sustain the action (Corkhill *et al.*, 2014); a comparative cognitive process is necessitated when stroking a dog, therefore, stroking a dog during periods of stress, whilst being attentive to the execution of the process, may engender a mechanism of distraction and grounding (Vagnoli *et al.*, 2015), just a short period of repetitive stroking could potentially mitigate stress and be deemed therapeutic.

Additionally, tactile stimulation has been associated with the secretion of oxytocin (Morris *et al.*, 2021), a complex multi-function molecule (McCormack *et al.*, 2020) which has gained significant attention in recent years (MacLean *et al.*, 2019); identified as a key molecule of biological interest (Grinevich *et al.*, 2016), oxytocin functions as a neuropeptide, neurotransmitter, and hormone. In its capacity as a neuropeptide oxytocin modulates certain physiological and behavioural processes,

including social bonding and stress response (Churchland and Winkielman, 2012). As a neurotransmitter, it is believed to facilitate the transmission of nervous impulses between areas of the brain associated with trust, empathy and emotional regulation (Barchi-Ferreira and Osório, 2021), whilst within its endocrinological role, oxytocin initiates uterine contractions during labour and promotes milk expression in response to suckling after parturition (Maier and Brecht, 2022). Furthermore, it is thought to modulate the release of dopamine (Baskerville and Douglas, 2010), and potentially inhibit the re-uptake of serotonin, (extending and augmenting the effect of serotonin) (Marazziti *et al.*, 2012), thereby counteracting the effects of cortisol secretion (by the adrenal glands) in response to stress.

Precise assessment of oxytocin levels presents a considerable challenge (MacLean *et al.*, 2019), owing to the instability of the oxytocin molecule (Churchland and Winkielman, 2012); whilst methods exist to determine the oxytocin concentration in blood plasma, saliva, and urine, the accuracy of these assessments remain subject to ongoing debate within the scientific community (MacLean *et al.*, 2019). One of the most reliable methods of oxytocin measurement involves the examination of hypothalamic activity, currently performed primarily within rodent studies, due to it being only achievable via autopsy (Okabe *et al.*, 2015).

One notable rat study, which demonstrated liberation of oxytocin in response to touch, revealed rhythmic, gentle stroking by the researcher, initiated the oxytocin release (Okabe *et al.*, 2015). Whilst studies examining the effect of tactile interaction with dogs, such as Petersson and colleagues., (2017), revealed touch resulted in elevation of oxytocin in both human and canine plasma, Nagasawa and colleagues., (2009), confirmed a significant increase in guardian urinary oxytocin when dogs also offered eye contact whilst being petted.

In regard to touch, Odendaal and Meintjes, (2003) and MacLean and colleagues (2017) suggest release of oxytocin is predominantly influenced by the affiliative nature of the social interaction (of human or animal) rather than the physical touch itself. Conversely, Sosnowski and colleagues, (2023) discovered release of oxytocin in captive capuchin monkeys engaging in self-soothing behaviour, due to exposure to an artificial stimulus (instigating skin irritation, i.e. an onion), was most pronounced when the monkeys were isolated, suggesting self-soothing was an efficient method of initiating oxytocin, independent to the affiliative effect. Consequently, fur rubbing was recognised as the primary catalyst for the observed elevation in oxytocin.

Wheeler and Faulkner (cited in Eckstein et al., 2020) attempted to harness this phenomenon hoping to induce anxiolytic effects, through tactile interaction with a pseudo pet (soft toy), comparing it with stress reduction (through decrease of heart rate blood pressure and perceived anxiety) resulting from engagement with a real dog. Stress reduction was only detectable during the canine interaction; furthermore, decrease in anxiety was more pronounced within the cohort of individuals presenting with a higher baseline measure of distress, indicating the impact of tactile interaction may be dependent upon trait anxiety (*ibid*, 2020). However, despite the lesser benefits observed in low trait participants, both low and high trait individuals derived comfort from tactile engagement with the soft toy, suggesting such devices may have some tangible effects.

Although the precise mechanisms accounting for oxytocin initiation and benefits of touch are yet to be determined, they may be attributed to the actual stimulation as evidenced by rodent (Okabe *et al.*, 2015) and primate (Sosnowski *et al.*, 2023) studies, possibly by an independent phenomenon resulting purely from affiliative dynamics (as proposed in feline studies (Johnson *et al.*, 2021), or alternatively could be due to a combination of both aspects, or another factor yet to be discovered. However, to the best of the researcher's knowledge, to date studies incorporating pseudo pets to induce anxiolytic effects have failed to produce comparable results to those seen in true animal studies, suggesting the "real animal" is fundamental to the effectiveness of any AAI; it is therefore plausible in comparison to AAI established relationships between dogs and guardians, providing additional opportunity for tactile interaction, could confer greater therapeutic advantage.

2.4.5.1 Impact of neurobiological signalling in respect of breast cancer

It has been demonstrated the presence of a dog initiates the release of oxytocin (Miller *et al.*, 2009; Grimm, 2015; Nagasawa *et al.*, 2015), promoting relaxation, hence may be beneficial in reducing stress (Miller *et al.*, 2009). Stress has also been implicated as a causative factor for carcinogenesis (Stewart & Wild, 2014) and potentially tumour progression. Given the stress reducing effects of oxytocin (Miller *et al.*, 2009), this would suggest that oxytocin is beneficial in respect of cancer; however, oxytocin has also been associated with tumour development (Lerman *et al.*, 2018). Currently, the biological processes are poorly understood, whether oxytocin is mitogenic or antimitogenic is yet to be determined (Khorrami *et al.*, 2018). There is evidence to suggest it is dependent upon the specific location and type of oxytocin receptors and the signalling pathway (Imanieh *et al.*, 2014), therefore, is cancer type dependent.

In relation to breast cancer oxytocin has been cited as being both mitogenic (Taylor *et al.*, 1990) and antimitogenic (Cassoni *et al.*, 1994; Sapino *et al.*, 1998), whilst Ito and colleagues, (1996) failed to determine attribution either way (Imanieh *et al.*, 2014). However, as there has been strong compelling evidence for many years multiparity and prolonged periods of lactation, cited as aetiological modifiable factors, have a protective effect against breast cancer (Cohen *et al.*, 2023); there is a theory oxytocin release via lactation or breast stimulation, associated with a reduction in oestrogen, serves as a preventative factor (Lerman *et al.*, 2018). This does point favourably to oxytocin being a positive influence in breast cancer prevention and reduction of recurrence; however, further studies are required to provide credibility to this theory.

The effects of oxytocin, positive or negative, are enhanced in the presence of oestrogen. Whilst men do produce oestrogen, women naturally have greater levels than men (Nagasawa *et al.*, 2015), 70% of breast cancers are oestrogen status positive (Turner *et al.*, 2017); as such, the signalling pathways controlling cell proliferation and tumour growth are stimulated in the presence of oestrogen (*ibid*, 2017). Whilst to date there have not been any published studies examining the effects of oxytocin release in relation to companion or therapy dogs and breast cancer, it may be that women with oestrogen positive status release more oxytocin than those with other types of cancer or those devoid of cancer, and could potentially experience a greater effect from contact with a dog than those with other cancers or without malignancy. In addition, it has been demonstrated this enhancement in oxytocin is not only generated in response to the presence of oestrogen; Tamoxifen (a synthetic version of oestrogen), a therapeutic employed in oestrogen receptor status positive disease (Sapino *et al.*, 1998), which blocks the oestrogen receptor sites so preventing the oestrogen from initiating a feedback process, also enriches the discharge of oxytocin.

In conclusion, whilst the biological basis of the benefits of dog guardianship for women with breast cancer it is not yet completely understood, evidence suggests dog guardianship may have positive effects both psychologically and socially for these women, and whilst the effects may be negligible for some, to date few negatives have been identified.

2.4.6 Increased human interaction.

The final mechanism revolves around heightened human interaction fostered by purposeful engagement with dogs, possibly correlated with biophilia and reciprocity. Biophilia (a term derived from the Latin *bios* meaning life and *philia* translates as love) theory postulates humans have a natural

attraction to other organisms and biota, (Wilson, 1984, pg. 1). Therefore, biophilia potentially enhances the positive effects associated with the aforementioned mechanisms or may facilitate increased distraction (Beetz, 2017). Whilst this may initially appear to be a positive trait, Amiot and Bastian, (2015) contend this theory of biophilia is too simplistic; merely being attracted to an organism does not necessarily imply a positive sentiment towards the entity. Joye, (2011) concurs, suggesting individuals may be drawn to nature but not automatically respect it.

2.4.6.1 Reciprocity

Reciprocity refers to the mutual exchange of care, support and companionship, potentially reinforcing the bond between human and dog (Rodrigo-Claverol *et al.*, 2023), and built upon a foundation of reciprocal trust, empathy and shared desire for closeness. Reciprocal benefits for the human may encompass emotional support, wherein the guardian derives reassurance from the companionship offered by their dog.

There exists a hypothesis that dogs may be able to sense fluctuations in their guardians' emotional states (Wilson *et al.*, 2022), potentially discerning a difference through visual or audio cues (Albuquerque *et al.*, 2016), or detecting subtle changes in pheromones or other biochemical signals (Wilson *et al.*, 2022), prompting a corresponding behavioural response which may include empathy (Silva and De Sousa, 2011), leading to a theory of "emotional contagion" between a dog and guardian (Palagi *et al.*, 2015). In exchange to perceived empathy, guardians may offer touch, through stroking, or gentle massage, potentially elevating oxytocin levels within the dog (Petersson *et al.*, 2017), or initiate activities the dog considers pleasurable, for example interactive games, or food focused enrichment.

Another form of possible reciprocation between dog and guardian is that associated with social interaction; by becoming the focal point during interpersonal communication, the dog assumes the role of "social lubricant", facilitating enhanced conversation (Harmon, 2019), which may help to diminish feelings of loneliness and mitigate anxiety experienced in social situations (Wong *et al.*, 2019). A study by Yamasaki, (2018) investigated the perceived benefits of own pet visitations to terminally or chronically ill patients; the presence of a pet (mostly dogs) had three main benefits, primarily the visit provided comfort to the patient, however it also acted as a conduit for enhanced communication between the health care practitioners and the patient, resulting in 'spontaneous' discourse with the patient offering insight into their lives and values, which may not have otherwise

have been discussed. In addition, relatives also gained solace from knowing they were doing something positive for the patient, gaining themselves a sense of comfort from the pet being with them at the bedside. Staff (many of whom were also pet owners) felt learning about and having the pet present promoted a 'shared identity' and consequently developed a better rapport with the patient and family (*ibid*, 2018). In this context, pets were viewed as social facilitators, and complementary to conventional medicine.

Further reciprocal advantages may include health benefits, such as those discussed earlier, including reduced stress (Osório and Silva, 2017), decreased heart rate (Handlin *et al.*, 2011), improved mental health (Fleishman *et al.*, 2015; Chubak *et al.*, 2017), and the acquisition of knowledge, as dogs learn from their guardians and guardians from their dogs. In return humans provide their dogs with appropriate nutrition and veterinary care (Simonen and Lohi, 2021).

2.4.7 The Self-Determination Theory as a framework for wellbeing in human canine interactions

A further theory posited to offer insight into the origin of the foundations of wellbeing within the context of human canine interactions is the Self Determination Theory (SDT) (Deci and Ryan, 2000). Kanat-Maymon and colleagues., (2021), explore this seminal work identifying autonomy, competence, and relatedness, as a framework for understanding the pivotal role dogs assume in aiding individuals in satisfying their psychological needs and conferring benefit to a relationship.

The SDT developed by Deci and Ryan, (2000) as an extension of their investigations into control of behaviour (Deci and Ryan, 1987), is one of the formative theories in understanding the origin of motivation, where motivators are categorised as either intrinsic or extrinsic (Reiss, 2012). Deci and Ryan, (2000) portray autonomy, competence, and relatedness as "motives" or psychological needs which must be addressed to cultivate intrinsic motivation, and consequently facilitate a sense of emotional contentment.

Kanat-Maymon and colleagues., (2021) explain their adoption of the SDT to animal interactions, indicating autonomy may be conferred by a relationship characterised by unconditional positive regard (Crisp, 2011), attained through the perception of the dog as a non-judgemental companion (Nieforth and O'Haire, 2020); competence, which is possibly an element of reciprocity (Rodrigo-Claverol *et al.*, 2023), may be fostered through dog's enhancing capacity to achieve, and relatedness

an inherent factor of the strong human-dog bond (Mills and Hall, 2014; Benz-Schwarzburg et al., 2020).

These three “motives” will now be examined in greater depth, initially within the context of the SDT, then in conjunction with companion animal relationships, and finally in relation to women navigating breast cancer.

2.4.8 Autonomy

Autonomy, originating from Greek, interpreted as “self- governance of a city” (Quante, 2011), is a term which was subsequently redefined by Kant to encompass the human aspect, defining it as “self- ruling of practical rationality” (*ibid*, 2011). Autonomy was later adopted by Beauchamp and Childress, (2001) as a constituent of their four principles of ethics. However, Deci and Ryan, (1987) define autonomy as “choice”, asserting “autonomy-supportive events and context, facilitate self- determined...activity”. Further evaluation of the term by Dworkin, (2015) posits autonomy as a complex multifaceted concept which is challenging to “characterise”, additionally he offers a range of synonyms including “self-assertion, critical reflection” and “absence of external causation”.

In the context of the companion animal relationship, canines are purported to foster autonomy by affording individuals avenues to freely express their thoughts and concerns without fear of being judged (Carlini, 2016), or feeling obliged to provide an explanation for their behaviours; a core principle of person-centred approaches employed in therapeutic contexts (Bolt *et al.*, 2022). Thus, the dog assumes the role of a non-judgemental impartial listener, in conjunction to being a confidant (Evans-Wilday *et al.*, 2018).

2.4.8.1 Being a non-judgmental listener

The capacity to self-disclose is believed to be of therapeutic benefit; furthermore, it has been demonstrated therapeutic value derived from self-disclosure is not limited to interactions with other individuals but can also be fostered through communication with artificial intelligence (Bowen *et al.*, 2021). It is therefore plausible a similar therapeutic effect may be conferred when disclosing to a canine. Consequently, dogs are frequently employed in contexts where a non-judgemental listener may be of benefit such as in schools to enable reading activities (Henderson *et al.*, 2020), in older person care homes (Jain *et al.*, 2020), or in special educational needs settings (Carlisle, 2015).

It is thought employing a dog to facilitate disclosure may have originated with Freud, whose dog Jofi would act as an enabler during psychotherapeutic interactions (Winkle *et al.*, 2020). Whilst a pet dog

may enable disclosure to others within a therapeutic environment, thereby serving as a social facilitator, they may also function more as a personal confidant, especially in times of distress; for example during the recent Covid pandemic, dogs were cited as helping mitigate the distress associated with uncertainty and separation due to their ability to be non-judgemental and because they were “apparently unaffected by the cause of the person’s distress” (Bowen *et al.*, 2021). Whether this status of “unaffected” extends to cancer related distress is unknown. Additionally, it is suggested those who confide in their dogs do so because they are seeking a non-judgemental listener, rather than one who will proffer advice or opinion (Kurdek, 2009), although it is also acknowledged levels of disclosure are highly individual and fluid (Barcelos *et al.*, 2020). Kurdek, (2009) asked individuals if they were experiencing distress who would they approach, participants indicated a greater probability of seeking support from their dog rather than a significant family member, friends, or children. However, if a partner was available, they were more likely to be engaged; Cohen, (2002) suggests the dog is often viewed less as a substitute and a more complementary source of support. Similarly, Evans-Wilday and colleagues., (2018) discovered dogs acted as a pseudo-partner. Guardians were more comfortable to confide in their dogs than a friend or third party when discussing “depression, jealousy, anxiety, calmness, apathy and fear related emotions”. Furthermore, they identified there were two subjects, jealousy and apathy, where speaking to the dog was preferred rather than engaging with partners (*ibid*,2018).

To the best of the researcher’s knowledge, there currently exists no evidence to support the assertion dogs are indeed non-judgemental, although future research utilising functional MRI may provide insights into this claim; it is known dogs respond to speech tilting their heads when processing relevant verbal messages whilst engaging with a stimulus they value, such as their guardian (Sommese *et al.*, 2022). Therefore, whether dogs are truly non-judgemental or are just good listeners is to some extent irrelevant if they are perceived as therapeutic.

2.4.8.2 Unconditional love

Alongside the non-judgemental aspect of dog guardianship, dogs are frequently acknowledged for their provision of unconditional love (Cole, 2019; Konok *et al.*, 2018; Zents *et al.*, 2017). Unconditional love, an uncomplicated affection and a component of Carl Rogers’ concept of unconditional positive regard (Crisp, 2011), is a notion founded upon acceptance of the individual regardless of what they say or do (Murphy *et al.*, 2020); this concept has been recognised as one of the missing and contributory factors to unmet needs of women with breast cancer, possibly associated with trauma due to disease and morbidity of treatment (Connolly-Zubot *et al.*, 2020). It is proposed the need to

experience love is intensified amidst cancer related distress, due to the association with reassessment of life's desires and priorities (Post *et al.*, 2020).

Jenkins and colleagues., (2014) assessed the extent to which school age children rated a dog interacting with them in an educational setting, in terms of the Rogerian concepts of “unconditional positive regard, empathy and congruence”; unconditional positive regard was cited as the highest rated emotional aspect by the children, perceived to be afforded through having the dog engage with them. Another study, focussed upon a group of university students' perception of the benefits of their companion animals (Faver and Cavazos, 2008), the majority dog guardians (65.3%), with an additional 12.5% being both feline and canine guardians, identified unconditional love and companionship as the greatest aspect of pet guardianship, with over 80% of the 208 participants citing it as the most important component. Whilst these examples predominantly involved younger individuals, they do highlight unconditional love as one of the most prominent facets of dog interaction, and furthermore offer insight into the valuable benefits that can be derived from such relationships.

2.4.9 Competence

Competence, one of the psychological needs identified by Deci and Ryan, (2000), can be conceptualised as necessity to experience a sense of achievement or accomplishment (Martin *et al.*, 2017), another aspect potentially influenced by a breast cancer diagnosis (Bárez *et al.*, 2009). Many factors both disease and treatment related may impact on a woman's competence, for example women may become self-conscious about their appearance, due to surgery, hair loss or feel less confident because of cognitive changes attributed to chemotherapy (Connolly-Zubot *et al.*, 2020).

Bárez and colleagues., (2009) assessed competence as a component of a broader investigation into the relationship between distress and control in breast cancer. The study concluded competence in conjunction with self-efficacy, a concept closely related to competence, identified as a predictor to coping for women with breast cancer, as it is closely linked to emotional wellbeing (Rottmann *et al.*, 2010) and coping style correlated with distress (as measured by the HADS and Profile of Mood States), indicating a potential relationship between “perception of control influences” and “psychological distress”. Hence there exists a potential to mitigate distress by enhancing control and competence.

A dog has the potential to foster competence through reciprocity (Simonen and Lohi, 2021), thereby assisting in the cultivation of self-efficacy. In their systematic review BorjAlilu and colleagues., (2017)

revealed that perceived levels of self-efficacy for individuals with breast cancer were related to demographic variables, plus the level of the support available to them. Dogs are often regarded as supportive (Herzog, 2011), sometimes they are also considered as a pseudo partner or friend (Evans-Wilday *et al.*, 2018). However, Cohen, (2002) contends dogs occupy a unique position, noting that although dogs are frequently equated with family members, they are not typically acquired as a substitute for a human interaction, rather they serve as complementary companions. Therefore, dogs may aid in fulfilling some of the unmet needs of women with breast cancer, without replacing the valuable social support women often desire (Beatty *et al.*, 2008).

2.4.10 Relatedness

Relatedness, the final aspect of the SDT identified by Deci and Ryan, (2000), within the context of breast cancer pertains to the presence of a relatable individual. This individual may either share similar concerns or possess the capacity to express empathy or offer support and understanding (Han *et al.*, 2019). A companion dog may serve as an empathetic ally (Albuquerque *et al.*, 2016) providing companionship and solace during periods of uncertainty or distress (Kirk *et al.*, 2019). Relatedness may also be associated with the strength and nature of the bond forged with the dog (Kurdek, 2008). Collaboratively navigating the world with a dog offers opportunities to bond, through reciprocation and mutually beneficial activities, such as physical recreation (Milne *et al.*, 2008), engaging in outdoor pursuits (Hope *et al.*, 2014), and increased social interaction (Harmon, 2019) may assist in the fostering of such a component.

The satisfaction of all the facets of the SDT may not only enhance intrinsic motivation but also foster increased wellbeing, thereby improving psychological health and fulfilling unmet needs. Consequently, a companion dog being with an individual during the cancer experience may hold the potential to enhance the quality of life of their guardian, and assist them with meeting needs that may not be adequately addressed by conventional services.

2.4.11 Impact of mechanisms on quality of life

As Holder and colleagues, (2020) indicate, consideration of all these factors may improve quality of life. One study specifically examining the quality of life of women with breast cancer in relation to companion animal ownership was that of Binotto and colleagues., (2017) who through the use of the quality of life assessment (WHO QOL Bref) determined whether there was any benefit of dog guardianship in terms of QOL within a cohort of 272 Brazilian women with a diagnosis of breast cancer. The WHO QOL tool, a questionnaire based instrument, is used to assess needs spanning the

following domains; physical wellbeing, psychosocial wellbeing, environmental demands (which includes home life, financial needs, access to leisure facilities) and independence (needs in relation to activities of living) (WHO, 2019). As such it has similarities to the FACT-G and (Cella *et al.*, 1993) FACT-B (Brady *et al.*, 1997), used to assess physical, psychosocial, emotional and functional wellbeing.

The study demonstrated overall QOL was enhanced by pet guardianship, although the authors failed to mention what types of pets were involved, only that they were domesticated. Of the 272 participants in the study, 162 identified themselves as pet owners. These 162 women compared to the remaining 110 non pet owners scored significantly higher in all the domains of QOL assessed; however, of most significance was the difference seen in the psychological domain, a mean difference of 3.85, the average score being 66.44 for non-pet owners and 70.29 for pet owners (Binotto *et al.*, 2017). As this study was quantitative it is not possible to determine the reasons for increase in QOL; Binotto and colleagues, (2017) hypothesise it could be due to the presence of pets helping individuals to gain a different perspective upon their QOL by increasing 'self-esteem'.

Ingram and Cohen-Filipic, (2018) whose study is closest aligned to the current research, employed FACT-G (Cella *et al.*, 1993) to assess the correlation between QOL and guardianship of companion or pet dogs, in combination with a modified version of the LAPS (Johnson *et al.*, 1992) (further explored within the methodology section) in conjunction with the FACT-G and CES-D (The Center for Epidemiological Studies Depression Scale) to ascertain whether strength of dog-ownership correlated with improved wellbeing and reduced depression. In addition, they incorporated three open-ended questions into the questionnaire which allowed them to gather both "perceived benefits and challenges" of dog ownership within the participant cohort during the period post-diagnosis (*ibid*, 2018). The study differs to the proposed research in that the participant group was not limited by gender or cancer type, however most respondents were women (95%) and had a diagnosis of breast cancer (65%) (*ibid*, 2018).

An inverse relationship was observed between depression (assessed with CES-D) and dog-guardian bond (assessed with LAPS) in relation to treatment status (i.e. whether the respondents were at the beginning of their trajectory of cancer care or were no longer receiving intensive management therapies). Those participants receiving active treatment who had a high LAPS score also scored highly for depressive symptoms, whereas those who had finished active treatment had a lower depression score (CES-D)' no statistical significance was seen (*ibid*, 2018). Given the treatment for cancer can range from chemotherapy with minimal side effects administered at home, to a

combination of intensive drug or radiation therapy involving daily hospital visitations, it is suggested that the variability in treatment options may have influenced the outcome, unfortunately this aspect was not acknowledged or explored within the paper, so the nature of the treatment is unknown.

Perceived benefits and obstacles associated with the anthrozoological relationship were assessed using a thematic analysis of written statements in response to open questions. Participants reported that their dogs helped them to sustain a daily schedule, motivated them to exercise (Forbes *et al.*, 2016; Binotto *et al.*, 2017), offered comfort by providing closeness and devotion (Herzog, 2011), acted as “social lubricants” (Yamasaki, 2018), reduced stress (Johnson and Meadows, 2008; Marcus, 2013; Fleishman *et al.*, 2015; Osório and Silva, 2017) and were non-judgemental listeners (Buettner *et al.*, 2011), (Ingram and Cohen-Filipic, 2018).

Challenges cited included meeting the dogs’ needs when the participants were experiencing reduced energy due to the burden of the disease or treatment, or occasions when they were out of the home for significant periods of time due to appointments (Royal College of Nurses, n.d.); some participants voiced concern about their ability to care for their dog in the future and potential separation from their pet (in the UK the Cinnamon Trust support people in this situation (The Cinnamon Trust, 2019). In addition, some respondents believed their dog’s behaviour had changed as a result of their disease or change to routine, others main concerns were financial hardship and funding their dog’s needs.

These insights into advantages and obstacles to dog guardianship in relation to living with cancer may assist health professionals, relatives and others to gain understanding and perspective about the role assumed by dogs in the life of someone with cancer.

2.4.12 Sentience and anthropomorphism

Dogs are widely acknowledged as sentient creatures within the UK under the Animal Welfare (Sentience) Act (AWSA) (GOV.UK, 2022). The etymological derivation of the term sentience is founded upon the Latin verb *sentire* meaning to feel, and in its simplest form may be interpreted as an organism’s ability to perceive and experience sensations (Hughes, 2022). However, defining the fundamental characteristics of living organisms and classifying the concept of sentience presents significant challenges, leading to a current lack of consensus within the academic community (Pulina, 2023). A classification adopted by the UK government as the foundation of the current version of the AWSA (GOV.UK, 2022) is that proposed by Crump and colleagues., (2022), who identified eight (neural, behavioural, and cognitive) criteria specific to sentient creatures; additionally, they devised

an assessment criterion to gauge the probability of sentience across a diverse spectrum of organisms. Sentience is often considered in conjunction with the “five freedoms of animals” specified within Section 9 of the Animal Welfare Act (AWA) (GOV.UK, 2006), endorsed by the Kennel Club as part of their Canine Code (The Kennel Club, 2024). The five freedoms include “freedom from hunger and thirst, discomfort, pain and suffering, pain and distress and freedom to behave normally”.

Animal welfare and the recognition of sentience is becoming a prominent issue particularly in the domain of AAI, where it is suggested an ethical and moral framework which recognises animals (especially dogs as the most commonly employed animal in AAI (Glenk and Foltin, 2021), as participants rather than objectifies them, should be developed (Santaniello *et al.*, 2021). Horowitz, (2021) concurs with this assertion, citing Pavlov’s Dogs as fundamental to the study examining classical conditioning, but highlighting their anonymity as part of the research until many years later. Conversely Pulina, (2023) posits the concept of sentience hinges upon the criteria of responsibility, arguing dogs by virtue of their perceived inability to assume rights, take responsibility for their own actions and lack of self-awareness, bringing into question their categorisation as sentient; he therefore contends dogs cannot be sentient due to an inherent power imbalance within the human-dog dyad, the dog being reliant on the human to meet their needs and delineate their freedom. As conferred by (Benz-Schwarzburg *et al.*, 2020) the responsibility sits firmly with the human, the dog being a compliant participant.

The precise meaning and definition of the term "sentient" remains elusive, presenting a conundrum yet to be resolved (Webster, 2022) . Rowan and colleagues., (2023) illuminate the complexity of this challenge by pointing out the ambiguity of the individual words embedded within the various definitions, words which may be open to interpretation and often influenced by anthropomorphism tendencies (Benz-Schwarzburg *et al.*, 2020).

Anthropomorphism refers to the attribution of human characteristics on a non-human entity, such as a dog (Paul *et al.*, 2014). A positive human-animal relationship is hypothesised to be founded upon three components, anthropomorphism, attachment, and empathy (Prato-Previde *et al.*, 2022). Anthropomorphism may manifest as behavioural or cognitive forms, often observed when pet guardians confer human-like characteristics upon their pets, demonstrated through either the choice of language or terms of endearment attributed to the animal or the way the animal is treated or perceived (Bouma *et al.*, 2023).

Whilst excessive anthropomorphism poses significant risks to dogs, and it is questionable as to whether sentience is being prioritised, for example, the selective breeding of brachiocephalic dogs to achieve certain attractive features (Prato-Previde *et al.*, 2022), there are also distinct positives, for example Butterfield and colleagues, (2012) demonstrated the use of anthropomorphic language when discussing a dog led to a higher probability of adoption. Moreover, an anthropomorphological approach was seen to be advantageous in reducing pain; this exploratory study revealed the selection of anthropomorphic terminology in conjunction with a selection of dog photographs viewed before exposure to a pain inducing event, attended by a therapy dog, resulted in a greater reduction in pain in the cohort “primed” using anthropomorphic language compared to a group who viewed the same images but were advised to consider the dogs in terms of utility, rather than pet (Turner-Collins and Breitenbecher, 2019). Turner-Collins & Breitenbecher, (2019) suggest this simple use of anthropomorphic language may enhance the potency of AAls whilst preserving sentience.

Therefore, as there exists some confusion as to the meaning of the terms and whether they should be viewed as positive or negative attributes, Pulina, (2023) suggests the freedoms delineated in the AWA (2006), hold greater relevance than solely acknowledging sentience status. Furthermore, Glenk and Foltin, (2021) advocate for the application of Beauchamp and Childress’, (2001) four ethical principles to any interactions involving dogs. These principles, relevant to any animals engaged in AAI, could equally apply in any human-dog dyad, particularly in instances where a dog is being employed in a therapeutic capacity, including in an informal way. Additionally, the acknowledgment of dogs as active participants through their explicit identification is fundamental if researchers are to show their appreciation for their contributions to anthrozoological and medical research (Horowitz, 2021; Santaniello *et al.*, 2021). Therefore, in the absence of consensus over terminology and assessment criteria of sentience, the enactment of the AWSA (GOV.UK, 2022) becomes the centrality of ethical standards governing UK based research, accordingly throughout this thesis, dogs will be regarded as sentient beings.

2.4.13 Potential negatives of guardianship during the cancer trajectory

It should be recognised however that not everyone feels able to continue to care for their dog post cancer diagnosis; treatment will often take them out of the home for extended periods of time, dogs are expensive to look after, especially when income may be reduced due to breaks in employment and people with cancer may also be immunocompromised making them more susceptible to zoonotic disease (Robinson and Pugh, 2002).

There is also evidence to suggest pet ownership may increase the chance of an individual with cancer dying sooner. Buck and colleagues, (2019) investigated the link between being a pet owner and the chance of dying from cancer, based upon an eight-year longitudinal health study incorporating 13,725 participants; they established pet ownership was associated with reduced survival in both male and female guardians, significance was seen specifically in women whose survival was reduced by as much as a year. This difference was particularly associated with bird ownership where a hazard ratio of 2.41 was observed, and in those with cats, (hazard ratio ,1.48) (Buck *et al.*, 2019). Whilst no biological basis for the for the increased mortality in cat or bird owners has been established it is hypothesised aflatoxins ingested in pet food then excreted may be the carcinogen responsible for elevated risk, women being at greater risk as there is a higher probability of them handling feline or avian faecal matter (Buck *et al.*, 2019). Neither dog guardianship in women (hazard ratio, 1.03) or pet ownership in men was identified as a risk factor for increasing cancer related mortality. Indeed, dog ownership may have a protective effect (Konradsen *et al.*, 2015), particularly in regard to lung cancer; the proposed protective mechanism thought to be due to dogs initiating an increase in endotoxins in the individual (human), provoking an internal immune response, leading to enhanced tumourcidal effects (Buck *et al.*, 2019).

2.5 Conclusion

This chapter has provided a comprehensive insight into the impact of a diagnosis of breast cancer, the risk of disease, the psycho-social impact, and the potential role of the companion dog in supporting a woman living with the condition. The next chapter will explore the conceptual framework underpinning the current study, the symbiosis of the two phases of the research and provide an introduction to the composite project.

3 Methods of inquiry

3.1 Introduction

A thorough analysis of the methods and methodology are a critical part of ensuring transparency and clarity of the techniques employed during the collection, analysis, and interpretation of the data (Clough and Nutbrown, 2012, pg.24). This chapter provides an introduction to the entire inquiry, presents the study objectives and explores how the project was conceptualised and shaped, including how the two phases of the project align, complement each other and enabled the collection of the resultant rich and novel insight into the impact of the dog-guardian relationship on the wellbeing of women during breast cancer survivorship. The philosophical paradigm of pragmatism is comprehensively examined and the ethical principles governing the study explored.

3.2 Precis of method

A “man’s, or for that matter a woman’s” best friend”, the dog (Morey, 2010), has been credited as being a non-judgemental listener (Buettner *et al.*, 2011; Evans-Wilday *et al.*, 2018), reliable (Brooks *et al.*, 2016), a supportive companion, enhancing wellbeing (Binotto *et al.*, 2017; Ingram and Cohen-Filipic, 2018) and reducing loneliness through the promotion of interaction (El-Alayli *et al.*, 2006 cited in Herzog, 2011) and activity (Forbes *et al.*, 2016; Binotto *et al.*, 2017).

The current study through exploration of the perceived benefits of pet dog-guardianship for a group of women living with breast cancer, aimed to build upon this knowledge and understanding of the anthrozoological relationship, through analysis of the narratives of the lived experience in conjunction with a comprehensive examination of the psychological theories guiding AAls in the oncological setting, alongside a detailed review of psycho-oncology, to discover how this relationship may be fostered for the wellbeing of those with breast cancer.

The inquiry consisted of a small-scale study, based upon a two-phase methodology commencing with a quantitative study (phase I), which was primarily to facilitate the sampling of participants for phase II; however, it also provided sufficient data for the generation of simple and descriptive statistics. The second phase, (phase II) integrated case study focussed, qualitative narrative gathering and analysis techniques to gain a deeper insight into the lived experiences of women with breast cancer and investigate the potential impact of dog-guardianship in relation to wellbeing throughout the survivorship period.

Case studies, historically the foundation of healthcare research in the guise of case notes, and with its origins in Freudian psycho-analytical writings, narrative analysis (Nissen and Wynn, 2014), are now viewed as valid and valuable elements of qualitative inquiry, especially within psycho-oncology where they are recognised as a method of facilitation enabling in-depth examination of personal experience through the capture of an individual's story (BPS, 2015), as exemplified by Thomas *et al.* (2009), Hall *et al.* (2013), MacArtney, (2016), Treiber *et al.* (2016), and Beach, (2022). A story which can inform and illustrate areas of well-being risk, potentially requiring psycho-oncological intervention or further investigation (BPS, 2015).

Case study methodology does not stipulate cohort size rather the number of cases within an inquiry depends upon a range of factors which may include the availability of cases and time, the study objectives, the complexity of the research and ethical considerations (Gerring, 2021). Psycho-oncological case studies typically involve low numbers of cases often illustrated through comprehensive narrative accounts to enable detailed examination (Beach, 2022) and analysis through in-depth consultation with an often vast and complex evidence base (Yin, 2018, pg.199). Furthermore, the generation of rich data may not only facilitate the review of in case and cross case variation (Mills *et al.*, 2012) but result in resources to enable learning through dissemination. (See chapter 5 for additional critique of case study and narrative analysis methodology).

The following objectives were identified. The first objective was to assess the relationship between women with breast cancer and their pet dog, based upon the guardian's perception. The second objective was to examine and analyse, also from the women's perspective, the perceived benefits of the relationship, and whether the guardian detected any changes to the relationship as a result of a diagnosis of breast cancer, and to sequentially propose recommendations and strategies for a range of healthcare providers and those in the canine industries, targeted at raising the awareness of the importance of considering the guardian-pet dog dyad when caring for the wellbeing of women with breast cancer. A pragmatic sequential mixed methods approach was employed, incorporating a two-phase technique, whereby phase I of the study, in addition to providing background data, enabled the identification of potential participants for inclusion in phase II.

The relationship between dog-guardian was measured using a modified version of the Monash Dog Ownership Relationship Scale (MDORS), a recognised and tested quantitative questionnaire (Dwyer *et al.*, 2006). Participants were requested to respond to a series of twenty-five statements assessing their emotional closeness (EC), dog ownership interaction (DOI) and the perceived costs (PC) of the relationship, by indicating the response that best matched how they felt about the nature of the relationship they had with their dog. A score nearer the maximum 5 for EC and DOI indicated a closer

relationship, whereas as a lower score (nearer to 1) for PC indicated the guardian regarded the cost of the relationship minimal.

Additionally, the Functional Assessment of Cancer Therapy - Breast (FACT-B) was incorporated into the questionnaire; this is an established and reliable set of questions (Brady *et al.*, 1997) designed to assess quality of life and wellbeing. Respondents were asked to select the response statement that closely resembled how they felt at the time, in relation to social wellbeing (SWB), emotional wellbeing (EWB), physical wellbeing (PWB) and functional wellbeing FWB); latterly each statement related to a score, for example “not at all” = 0, “very much” =5, a score for each subscale was calculated in addition to the overall score (0-148), a higher score indicating a better quality of life. The questionnaire also incorporated questions designed to capture demographic information and a section for respondents to provide contact details if they were willing to participate in phase II of the study.

Phase II employed case-based narrative gathering techniques, which facilitated the construction of individual participant stories, and a comprehensive examination of the psychological dimensions inherent in each narrative. Participants who had expressed a willingness to be involved in phase II were subsequently contacted to ascertain their continued interest in involvement. Initially, selection was conducted from a pool of volunteers using a loosely predetermined algorithm; however, this was later broadened to encompass all volunteering participants. This resulted in two participants who produced their own narratives prompted by an open-ended question and some guidance. One participant created a series of videos, which were remotely uploaded to the institution’s secure server, the other a written narrative of their experience. These methods were an adaption to the original approach of in person interviews due to the pandemic occurring at the time.

Two additional participants were subsequently recruited from the final pool of volunteers identified in phase I, these participants engaged in a telephone interview with the researcher, framed around the same open-ended question employed with the previous participants. After a period of initial transcription and preliminary data analysis, both the original phase II participants and one of the subsequent participants completed a follow-up telephone interview. All interviews were transcribed, and the content generated through the different methods of data capture for each individual merged to form a coherent chronological account.

Individual stories were created for each participant, providing an accessible depiction of the lived experiences of the women. These were then shared with the respective women for their review and comment. Furthermore, a critical analysis of the psychological aspects emerging from the case

analyses was completed, complemented by an analysis of the overarching themes that emerged. These themes were further comprehensively debated and analysed as part of the discussion chapter, leading to a range of recommendations for health professionals, those in the canine related industries and volunteer sector, to enable them to more effectively support women dog-guardians who are experiencing breast cancer.

3.3 Analysis of study methodology

The aim of the study was to develop knowledge and understanding about the perceived benefit of a relationship with a pet dog for women with breast cancer. In gathering this information about lived experience, it is crucial the research approach be determined. Considering the ontological and epistemological stances in relation to the two components of the philosophical framework of the inquiry, it is important to recognise the data produced in phase I is quantitative, which aligns with a positivist research paradigm (Park *et al.*, 2020), whereas phase II explored the perceived benefits of the human-dog dyad in the context of breast cancer; this phase also generated new knowledge, itself inherently contextual and subjective, reflecting only the specific time and setting in which it was constructed (Thomas *et al.*, 2014). Moreover, it should be acknowledged that the narrative developed was in response to the researcher's initial open question, therefore is co-constructed (Kim, 2014); referring to Crotty, (1998) the epistemological standpoint of phase II is social constructivist. The social constructivist approach recognises the co-construction of reality through social interactions (Knapp, 2019), in this case involving the women, their dogs and others in their environment, as well as the interpretation of their experiences (Cottone, 2007).

Whilst it shares some principles with interpretivism, its focus upon social interaction and social contexts distinguishes it; hence, for the purpose of comparison the term interpretivism will be used as a broad term within the following analysis of pragmatism. At first glance, this inquiry integrates both a positivist and social constructivist approach, potentially resulting in conflict in the quest of both objectivity and subjectivity; thus, to reconcile these perspectives a sequential mixed methodology was adopted, leading to a philosophical standpoint of pragmatism.

3.4 The Pragmatic Paradigm

Pragmatism, an approach or paradigm associated with “common sense” (Klockner *et al.*, 2021), permits the combination or pluralism of approaches, more it involves selection of the most appropriate methods for the problem being solved (Allemang *et al.*, 2022). It does not favour a particular method, but allows the researcher to adopt the method that best serves the question being

asked, and the research community (Allemang *et al.*, 2022). Due to adaptability this permits greater value to the study (Kelly and Cordeiro, 2020), where perspectives and differing points of view are seen as adding to the richness of the data; hence, pragmatism offers a method that enables more possibilities (Goldkuhl, 2012), and allows for flexibility. It is an iterative process where the end point is specified, but the journey is not identified, alternatives and perspectives can be considered (Kelly and Cordeiro, 2020).

Viewed as a method of facilitating “research and practice” (Klockner *et al.*, 2021), it inverts the traditional sequence of theory to practice, transitioning it to practice to theory (Kelemen and Rumens, 2012), and extends “beyond evidence informed practice” (Klockner *et al.*, 2021). Whilst this may suggest pragmatism is founded upon amorphous foundations, it remains evidence based. The distinction lying in the context under consideration (Klockner *et al.*, 2021), as it is focussed on “real world problems” (Kelly and Cordeiro, 2020), and is a philosophy founded upon human experience (Allmark and Machaczek, 2018). Pragmatism considers individuals in their familiar environments (Kelly and Cordeiro, 2020), viewing them as partners rather than subjects; furthermore the individuals are regarded as experts of their own experience (Kelly and Cordeiro, 2020; Allemang *et al.*, 2022), aligning with a concept known as patient-oriented research (Allemang *et al.*, 2022), although the researcher contends labelling individuals as patients equates to viewing them as subjects, therefore throughout this thesis participants will be referred to, where possible, as women with breast cancer.

Pragmatism prioritises “social justice” and the creation of solutions or improvements for the common good (Kelly and Cordeiro, 2020). “Positive change” (Allemang *et al.*, 2022) and outcome is fundamental in pragmatic study, “guided by purpose and knowledge” (Goldkuhl, 2012). The outcome of the inquiry is a critical element, it must be meaningful and interventional (Goldkuhl, 2012; Allmark and Machaczek, 2018); however, whilst lived experience is a central component of a pragmatic approach, the engagement is determined by the method and researcher (Allemang *et al.*, 2022), this necessitates careful consideration of all practical aspects of the inquiry including “resources” and “positionality” (*ibid*, 2022).

From an ontological and epistemological standpoint, pragmatism has evolved as a reaction to “academic scepticism” to positivism (Kelly and Cordeiro, 2020); whilst frequently juxtaposed with positivism and interpretivism, pragmatism focuses more on the research question than the epistemological or ontological approach, or methods employed (Klockner *et al.*, 2021), offering an alternative to interpretivism in qualitative research (Goldkuhl, 2012). Regarded as an emergent philosophy, pragmatism diverges from interpretivist approaches by integrating a mixed methods

approach (Kelly and Cordeiro, 2020; Allemang *et al.*, 2022), prioritising practicality over the application of a specific method for a particular context (Kelly and Cordeiro, 2020).

Centred around the formulation of multiple realities based upon human experience (Allemang *et al.*, 2022), the experience, not reality as being a single truth (Kelly and Cordeiro, 2020) and founded on the principle of “multiple truths”, pragmatism provides a framework for the development of a more detailed naturalistic perspective of human behaviour (*ibid*, 2020) and offers a connection between theoretical constructs and practical reality (Klockner *et al.*, 2021). Dewey, one of the early proponents, posits that the interpretation of human experience leads to the creation of new knowledge and understanding, and hence change (Kelly and Cordeiro, 2020). Human experience typically serves as the foundation of qualitative inquiry.

Whilst there is a distinct difference between qualitative study, which may be viewed as “inductive-subjective-contextual”, and quantitative research which is focussed upon being “deductive-objective-generalising” (Morgan, 2007), the distinction between interpretivism, often thought as the foundation of qualitative research, and pragmatism is not so clear (Goldkuhl, 2012). Here Goldkuhl, (2012) provides insight, proposing pragmatism acknowledges the multifaceted nature of knowledge, encompassing not only “explanation (key form of positivism) and understanding (key form of interpretivism)”, but also extending to the exploration of possibilities, or solutions; further Allemang *et al.*, (2022) suggests whilst knowledge in pragmatism is contextual, the learning derived from it is transferable to other contexts, therefore provides an alternative to the notion of generalisability (*ibid*, 2022).

Goldkuhl, (2012) thus provides the following epistemological differences between interpretivism and pragmatism, positing that interpretivism is associated with “understanding”, whereas pragmatism prioritises “constructive knowledge”. Furthermore Allemang and colleagues., (2022), propose the ontological disparity lies in interpretivism’s focus on “co-constructed realities in local and specific contexts”, contrasted with pragmatism’s approach where “reality is renegotiated and interpreted based on usefulness in specific contexts”, thereby indicating its distinctiveness through its emphasis on transferability. Cronen, (2001) further asserts the result of pragmatic study should not only incorporate transferability within the inquiry community but also extend to the researcher, enabling them to “be better at asking useful questions” and “being more capable of seeing the ways actions are patterned”.

Morgan, (2007) in the quest to define pragmatism, therefore presents an alternative perspective, diverging from the conventional quantitative and qualitative epistemological and ontological

frameworks, positing “abduction-intersubjectivity-transferability” as a pragmatic approach, allowing for both induction and deduction in addressing specific inquiries or resolving problems. It refrains from adopting a purely objective or subjective stance, opting instead for intersubjectivity, while recognising knowledge generated is not generalisable but may have applicability in other contexts. However there exists a debate as to whether a pluralistic approach may lead to relativism, and ethical ambiguity (Chang, 2019), highlighting the need for reflexivity and transparency within an inquiry of this nature. Thus, it is recommended researchers clearly articulate their philosophical stance and evidence the rationale behind selection of methodology (Boucher, 2014).

Brendel’s, (2006, pg. 29) “four p’s”, “fundamental principles of philosophical pragmatism” offered a method of evaluating the utilisation of a pragmatic approach, focussing on the attributes of the research being “practical, pluralistic, participatory, and provisional” (Klockner *et al.*, 2021).

The alignment with these criteria was assessed thus:

- Practical; the practicality of the research is demonstrated through its focus on outcomes to inform practical interventions aimed at enhancing the wellbeing of both the women and their dogs.
- Pluralistic; pluralism was demonstrated through the utilisation of a mixed methodology and its potential to inform a multidisciplinary audience.
- Participatory, the participatory nature of the inquiry is evident through its emphasis on co-creation.
- Provisional, whilst the methodology was formulated in part to adhere to ethical review purposes, the inquiry was designed such that flexibility and contingency were incorporated enabling adaption without compromising the study’s focus or necessitating further ethical review.

Furthermore, Biesta’s, (2010) framework of seven questions to evaluate any potential conflict within a mixed methods approach allowed the researcher to determine whether the philosophical stance aligned with the pragmatic paradigm. Summarising the questions and answers within the framework, the following is ascertained.

“Data – Is it possible to have numbers and text within the same research?” (Biesta, 2010).

The data generated is numerical in phase I, textual in phase II, combining these results does not present any significant or theoretical issues, rather it yields two forms of information.

“Methods – Is it possible to have data analysis methods for the analysis of numbers and text within the same research?” (Biesta, 2010).

Numerical data informs the descriptive statistics, narratives are interpreted, data is analysed using the most appropriate method, in doing so, no practical or philosophical issues arise.

“Design – Is it possible to have interventionalist and non-interventionalist designs within the same research?” (Biesta, 2010).

A non-experimental design is employed, both phases of the research are non-interventionalist, therefore no conflict between the approaches, and the philosophies of the methodology, exist.

“Epistemology - Which epistemological set of ideas is most appropriate to account for the knowledge generated through a mixed approach?” (Biesta, 2010).

As data being offered by respondents in phase I is dependent upon their interpretation of the questions and honesty in response, it is considered subjective data rather than objective; likewise narratives generated in phase II, whilst co-constructed are open to interpretation, therefore, both components of the study are inherently subjective, hence no difficulties arise when employing a mixed methodology.

“Ontology – Is it possible to combine different assumptions about reality within the same research?” (Biesta, 2010).

All data generated is naturalistic and context dependent, real only the during time and in the context produced (Lincoln and Guba, 1985), as such it does not provide a deterministic viewpoint, more one requiring interpretation and as such is of an interpretivist or social ontology.

“The purpose of the research – Is it possible to combine the intention to explain with the intention to understand?” (Biesta, 2010).

The purpose of both aspects of the research is to develop new knowledge, constructed upon understanding rather than in a mechanistic way, no conflict in the approach exists.

“Practical roles - Can research be orientated toward both a technical and a cultural role?” (Biesta, 2010).

From a practical perspective the study aims to generate new knowledge from the combined data sets, to enable health care practitioners to gain a greater understanding of the cultural and social aspects of the relationship between women with breast cancer and their dogs. This symbiosis between the two research methods causes no issues in practical terms or in reference to the philosophies of the research.

Considering all these questions and answers it can be concluded there appears minimal, if any, conflict between the two methodologies employed within this study, as such the philosophical standpoint adopted is one of pragmatism.

3.5 Ethical considerations

Ethics are the “standards of professional conduct researchers are expected to maintain” (Thomas and Hodges, 2014) encompassing the methods, safety, candour, and equity of the project (*ibid*, 2014), ensuring participants welfare is protected, and they are served with honesty and respect (*ibid*, 2014). Risk and harm are minimised, and any volunteers participate without compulsion or coercion (Mauthner *et al.*, 2002); this is the basis of the Singapore Statement on Research Integrity (2010) (Steneck and Mayer, 2010). Thus, in developing the methodology, guidance provided by the UK Research Integrity Office (UK IRO, 2019) was consulted, and legal and ethical aspects considered. Additionally, the following ethical codes were examined; The “British Psychological Society Code of Human Research Ethics” - 2nd edition (BPS, 2014), “The British Psychological Society Code of Ethics and Conduct” (BPS, 2018), and “The British Sociological Association Statement of Ethical Practice” (BSA, 2017). To follow is an exploration of the ethical issues associated with the inquiry; these are divided into two areas, those associated with the ethical approval processes, and a summary of the ethical issues in relation to the data collection.

3.5.1 Ethical approval process

Prior to commencement of the data collection an application was made to the university’s ethical approval committee. Approval committee review is standard practice (Earthy and Cronin, 2016), involving the vetting of the application to ensure that the proposed research is morally right and safe. Accompanying the application were the participant information sheets for phase I (see Appendix 3) and II (see Appendix 14), consent forms for phase I (see Appendix 4) and II (see Appendix 16), a copy of the phase I questionnaire (see Appendix 5), and an overview of the phase II interview structure (see Appendix 18). Following scrutiny by the university’s research ethics committee, full approval for the study was granted (see Appendix 1).

3.5.2 Ethical perspectives

In developing the application, several key areas were considered; autonomy of the participants, informed consent to participate, respondent anonymity, confidentiality of the volunteers and their data, data protection, data management, and risk assessment for both participants and researcher.

Potential beneficence and non-maleficence were also explored. Each of these aspects will be elaborated upon in the following sections.

3.5.2.1 Autonomy of participants

Autonomy refers to the “right to make one’s own decisions and choices that align with an individual’s own beliefs and values” (Hammersley and Traianou, 2012); in the context of the study this may be interpreted as ensuring that potential participants are free to self-determine if they wish to participate in the research. Therefore, provision of comprehensive, yet not bewildering, participant information sheets (Thomas and Hodges, 2014) furnished potential participants with details about the stages of the study (*ibid*, 2014). The phase I participant information sheet was integrated into the on-line questionnaire, situated before the consent form to ensure information was supplied prior to soliciting consent; additionally, it was available on the website, developed as part of the recruitment process (King *et al.*, 2014). Providing potential participants with this information in an accessible format allowed them to review the information, and carefully consider their involvement in the study at all stages, additionally they were invited to contact the researcher if they had any outstanding questions about the project or their participation (Earthy and Cronin, 2016).

Incorporating promotion of self-selection in the study through the use of social media reduced the risk of coercion to participate in phase I (Campbell *et al.*, 2020). Coercion is the practice of exerting pressure or threat to an individual to compel them to act against their will (Anderson and Corneli, 2018), the likelihood of which is intensified when people are approached directly by a researcher on an individual basis, for example in a clinic or shopping centre. Avoidance of coercion in phase II (Thomas and Hodges, 2014) was facilitated by sending the participant information sheet to potential participants prior to the researcher contacting them by telephone. Initially volunteers were contacted solely by email and asked if they consented to a telephone call to complete the narrative gathering interview. The researcher arranged the call only after receiving a reply email confirming the participant’s continued willingness to be involved. Furthermore, the researcher did not make multiple attempts to contact participants between the data collection events, as they were cognisant of the vulnerability of the participants (Bracken-Roche *et al.*, 2017) and social and economic climate at the time. If contact with the participant was not successful after two attempts, no further attempts were made. Hence coercion was avoided, and autonomy promoted.

Respect for autonomy also refers to provision of opportunities and options to “opt-out” or withdraw from the study (British Psychosocial Oncology Society, 2019) without penalty or repercussions (Hammersley and Traianou, 2012). Permitting “opt-out, no questions asked” allowed participants to

remain autonomous throughout the data collection period (Sieber and Tolich, 2015). “Opt-outs” were enunciated via the participant information sheets, online guidance, and verbally prior and during the interviews (Gavin, 2012). “Opting out” was facilitated by the researcher ensuring interviewees in phase II were aware that they should only share as much information as they felt comfortable divulging. Consequently, when participants were asked to “tell their story” (Earthy and Cronin, 2016) they were advised to share only what they wished to and that they could terminate the interview at any point. Elliott, (2005) posits that whilst narrative processes permit respondents to choose what they share, there is a possibility that, as they have a “listening ear”, they will divulge more than anticipated, and a subject not considered particularly emotive results in distress. Lieblich and colleagues, (1998) likened this to “opening of Pandora’s box”. Therefore, the researcher was alert to this possibility and would have ended the interviews if they had detected any indication of distress or any other unforeseen consequences.

3.5.2.2 Informed consent, anonymity, and confidentiality

Informed consent gained following full disclosure of the research requirements (British Psychosocial Oncology Society, 2019) ensures volunteers have given their permission to be involved, are aware what participation encompasses, how their data will be collected, stored, analysed, written up and disseminated; it is paramount participants are aware research findings will be reported and shared in a variety of ways whilst assuring anonymity (Elliott, 2005).

The online questionnaire was designed to collect responses whilst preserving participant anonymity; however inclusion of an “opt-in” section at the end of the questionnaire, asking whether respondents were willing to be involved in phase II, prompted women to divulge their names and contact information, thereby forfeiting their anonymity. Often used interchangeably anonymity refers to a participant remaining a complete unknown, which in this circumstance was not feasible for the respondents who wished to participate in phase II of the research, whereas confidentiality safeguards the data of the participants ensuring it is only utilised for the purpose for which permission has been granted (Sieber and Tolich, 2015). It was therefore imperative that their confidentiality was retained. As such, any identifying information acquired was strictly utilised only for the explicit purpose for which consent had been obtained (see Appendix 4,16,17), and securely stored in a password protected database only accessible to the researcher and supervisory team; originally this was located on the university’s Tundra system, subsequently transferred to the institutions SharePoint. Furthermore, consent to conduct and record the interview was requested prior to each event, including follow up interview with the same participant (Miller *et al.*, 2012). Consent forms were stored on the secure database, as were the recordings and transcripts of the meetings.

3.5.2.3 Data storage and management strategies

In the UK the General Data Protection Regulations (GDPR) from the Information Commissioner's Office (ICO, 2018) apply to any data identifying individuals, hence are pertinent in this study. Under GDPR (ICO, 2018) individuals should be informed and consent to their data being compiled, stored, or shared. Identifying information should only be used for the purposes for which consent has been attained, and provision should be made for the safe disposal and deletion of any data no longer required on completion of the study (ICO, 2018).

GDPR (ICO, 2018) also require the researcher to make provision for safe storage of data, including ensuring that the institution's, in this case, the university's, GDPR policies are upheld, and all "research data is held in a secure manner" (BSA, 2017). Therefore, to enable GDPR (ICO, 2018) compliance, questionnaire data was downloaded from Qualtrics, (2019) , and subsequently Jisc, (2024), due to an unforeseen transfer between survey platforms. For Qualtrics, (2019) this occurred at the point of system transition, for Jisc, (2024), data was downloaded at the curtailment of the data collection period, once sufficient numbers of submissions were obtained and an adequate number of respondents willing to participate in phase II had been identified. Responses were then deleted from the relevant systems.

Data including interview recordings, transcripts and any identifying information were secured on SharePoint. Telephone recordings, after being transferred to the SharePoint as MP3 files, were wiped from the Dictaphone and the storage system re-formatted. No identifying hardcopy data was held, however FACT-B scoring sheets (FACIT.org, 2024) were generated for each participant; these were coded with numerical sequential response numbers to ensure anonymity. Subsequently after input of the summary data to the results spreadsheet, these scoring sheets were shredded. Through these meticulous data management strategies, anonymity and confidentiality were maintained; however, it should be recognised that this responsibility extends beyond the conclusion of the study. Data stored on SharePoint will in accordance with the participant information sheet be retained for a maximum five years, during which research outputs will be generated. After this time the data will be destroyed.

3.5.2.4 Beneficence and non-maleficence of participation

In developing the proposal and execution of the study the benefits and potential risk to the participants were considered; the principal of utilitarianism (O'Leary, 2007) is founded upon beneficence outweighing maleficence (Beauchamp and Childress, 2001), a study may be considered ethically right, if it is of beneficence and harms are minimised (Hammersley and Traianou, 2012). The

researcher, as documented in the reflexive account (see Chapter 1), anticipated the outcome of the study would benefit the volunteers, through increased understanding of the role and potential positive influence of their dogs on their lives, and how this may be fostered for the benefit of others. Furthermore, it may have provided a cathartic release or opportunity to develop an existential understanding of their experiences (Narayanasamy, 2015). However, it is acknowledged that the target group are vulnerable (Bracken-Roche *et al.*, 2017) due to their health condition and may have been experiencing cancer related distress (Mitchell, 2014), potentially impacting their cognition. Therefore, whilst no harm was anticipated, safeguards were incorporated into the design of the project, to allow for participant withdrawal (Sieber and Tolich, 2015). Additionally, the researcher provided information about organisations supporting women with breast cancer to those requiring further assistance (Thomas and Hodges, 2014). See Appendix 6 for signposting information.

The entire study was risk assessed, “a systematic process for identifying risk associated with...processes, actions or events” (Covello and Merkhofer, 1993, pg.3) on an ongoing basis, in accordance with the ethical approval process (Hammersley and Traianou, 2012). Should any concerns have arisen that would have indicated the interviewee was in present or probable harm, or evidence of previous harms or concerns be disclosed, the researcher would have reported and discussed these with the Director of Studies, or the appropriate authority where pertinent. In the case of immediate danger or harm the emergency services would have been called (Morris, 2015). Confidentiality would only have been breached if a participant had disclosed any serious issues of concern to the researcher, whose response would have been context dependent.

Ethical consideration is a fundamental component of any research project (UK IRO, 2019), however ethical scrutiny is not a static process. A study of this nature is an evolving project; hence, ethical issues were reassessed on a regular basis to ensure ongoing compliance with ethical standards and any emerging concerns addressed promptly.

3.6 Conclusion

This chapter has provided a thorough exploration of the overall methodological approach, including an analysis of the pragmatic paradigm and ethical considerations. The following chapter will provide a comprehensive account of the methods employed in phase I of the study, incorporating a critical analysis of the instruments utilised, sampling techniques and analytical methods executed.

4 Phase I

4.1 Introduction

This chapter examines the methodology employed in phase I of the study, commencing with a detailed overview of the techniques utilised, a quantitative questionnaire distributed through social media and disseminated amongst breast cancer support groups, with active social media engagement. Next, a comprehensive analysis of the methodology, including selection of research instruments, sampling techniques and modifications to the method due to unforeseen circumstances is explored. Finally, the results of phase I are presented and critically discussed.

4.2 Phase 1 overview

Phase I explored the relationship between women with breast cancer and their dogs, based upon guardian's perception; additionally, it facilitated the identification of women willing to participate in phase II of the study. This was achieved through the administration of a quantitative questionnaire encompassing two recognised and validated scales; the first, a modified version of the MDORS (Dwyer *et al.*, 2006), measuring the strength of the human-animal relationship; the second, the FACT-B (Brady *et al.*, 1997), used to assess the quality of life of the participants. In addition, demographic questions regarding both guardian and dog/s were included, these addressed the following areas; marital status, year of cancer diagnosis, stage of breast cancer, treatment status, UK residency, geographical region of UK residency, confirmation of dog ownership, number of dogs, years dog owned, breed of dog, age of dog.

Following ethical approval, where the proposed survey instruments, consent forms and participant information were reviewed, an electronic version of the questionnaire (see Appendix 5) was developed. The questionnaire composed of participant information (see Appendix 3), consent form (see Appendix 4), modified MDORS (Dwyer *et al.*, 2006) (25 questions), FACT-B (Brady *et al.*, 1997) (36 questions), demographic questions, plus request for participant's name, email address and phone number should they wish to participate in phase II. Initially inputted into Qualtrics, (2019), the questionnaire was checked for accuracy, accessibility through links provided and ease of obtaining results, before data collection commenced. The consent form, an essential component (Anderson and Corneli, 2018), ensured participants read the participant information and granted permission for their responses to be recorded and stored, before proceeding with the main questions.

The data collection commenced in September 2019; selected, as it coincided with Breast Cancer Awareness Month. A press release / flyer (see Appendix 7) (produced in conjunction with the

university's press office) incorporating information about the study and link to the questionnaire was disseminated through the university's social media channels, the researcher further distributed this press release via their own social media contacts, with a request to "please share", thus initiating a snowball distribution. Furthermore, the press release was shared directly via Twitter (now X) messaging, to the administration team or gatekeepers (Gillham, 2008; Earthy and Cronin, 2016) of a selection of breast cancer support groups, in addition to a cohort of dog trainers, with a request again, to "please share"; this then afforded them as the responsible person to determine permission for the flyer to be posted on the groups' social media platforms or circulated to the groups' members, either electronically or manually.

Following a brief interruption associated with uncertainty surrounding progression of the Covid 19 pandemic, in conjunction with a change in licensed online survey platform by the institution, necessitating the researcher to download all responses to date, delete them from Qualtrics, (2019), become familiar with a new system and subsequently re-upload the questionnaire to an alternative platform, Jisc, (2024) a request to share the survey was sent, via email to several independent local breast cancer support group leads, identified through a list sourced from a publicly available internet site. Prioritising local groups initially, as the primary intention was to follow the questionnaire with in-person interviews in phase II.

Subsequently, as a result of the prevailing pandemic and the potential of being able to conduct in person interviews being unlikely, due to restrictions on movement, it was decided to widen the geographical target area to incorporate the entire UK, to permit further snowball sampling; this led to a broader geographic selection of breast cancer support groups, in addition, combined cancer support group leads being contacted. Unfortunately, few support group leads responded, those that did indicated due to the pandemic they were no longer able to meet; some groups had disbanded, it was uncertain they would be re-established in the foreseeable future, many had become financially unviable, and they, therefore, had no way of contacting their members.

In an effort to engage women with breast cancer, maintain continuity of the study and in consultation with the supervisory team, and university press office, a website was developed (see Appendix 8). This platform included comprehensive information about the study, participant information, a short informative video from the researcher, offered signposting to breast cancer support services and provided a direct link to the questionnaire; additionally, women expressing an interest in directly participating in phase II, were invited to contact the researcher. The website, to enable the distribution of the webpages, was accompanied by development of a Facebook page about the research (see Appendix 8). Subsequently, the Facebook page was further disseminated amongst a

network of dog training professionals, in combination with a month-long sponsored advertisement on the Facebook platform (March to April 2021). Data collection was formally closed in May 2021, the last recorded questionnaire response was November 2020.

The results, downloaded, as Excel spreadsheets, were converted from statements, (see questionnaire in Appendix 5) into numerical scoring to enable computation of individual surveys responses. For FACT-B this was facilitated through use of FACT-B results sheets provided upon registration with the FACIT.org, (2024), the mMDORS (Dwyer et al., 2006) evaluated using criteria stated in Appendix 9. Findings were analysed, and descriptive statistics generated to enable comparisons with standardised results supplied by the FACIT.org, (2024), additionally any individuals meeting the algorithmic criteria for inclusion in phase II were identified.

It should be noted however, that prior to curtailment of the survey, interim results were periodically downloaded and reviewed; this resulted in the identification of six respondents who had indicated they were willing to participate in phase II, with a high score for emotional closeness on the mMDORS and emotional wellbeing on FACT-B. These participants were contacted by email in May 2020. Two of the individuals contacted responded positively, leading to their subsequent enrolment into phase II (see next chapter).

4.3 Selection of methodologies

In order to meet the first objective, it was necessary to measure the strength of the relationship between women and their dogs, also assess the women's quality of life. The questionnaire developed encompassed two recognised and validated scales of assessment, both quantitative in nature, and resulted in two independent sets of data, that were subsequently reviewed in conjunction with each other to determine whether there was any connection between the relationship the women shared with their dogs and levels of wellbeing exhibited.

Alternatives were considered prior to a questionnaire being determined the most appropriate approach, options included observational techniques, individual interviews, and focus groups. Whilst an observation method reduces the need for respondent interaction, the presence of the observer may significantly influence the behaviour and actions of the observed (Salkind, 2010); covert studies are possible but are ethically very challenging (O'Reilly, 2009). In addition, limited participant contact may restrict the amount of useful data attainable during observation, as such they are really only feasible in specific contexts, for example time and motion studies, or behaviour assessment (Salkind, 2010). Individual interviews and focus groups tend to focus upon the generation of qualitative data,

an interview response will always be influenced by the interviewer (Preskill and Russ-Eft, 2005) being inherently impacted by both the skills and quality of the reporting (Gubrium and Holstein, 2001). Likewise, the quality of a focus group is significantly influenced by the ability of the facilitator and the dynamics of the group being consulted (Barbour, 2007), as well as the skill of the co-ordinator to pick up on verbal and non-verbal cues shared within the group (*ibid*,2007).

Questionnaires permit the canvassing of many respondents in a short period of time, costs are generally lower than interviewing due to reduced necessity for travel, manpower, and material resources (Sue and Ritter, 2012), as distribution to a wide geographical area through postal or electronic means is possible (*ibid*,2012). However, this may result in a lower response rate than could be achieved from a more personal approach via interview, or individual application of a questionnaire (Dahlberg and McCaig, 2010). Additionally, respondents are less able and less likely to clarify their understanding of the questionnaire should any difficulty with ambiguity of question arise (Greener, 2011). Although an opportunity to ask questions is often offered and a contact number provided, few respondents will initiate contact (Sue and Ritter, 2012). Furthermore, McNeill and Chapman, (2005) suggest questionnaires may yield responses that do not reflect the true answers of the respondents, positing answers given may be influenced by others (*ibid*, 2005); equally, it could be said that interviews may result in a similar outcome.

It was determined that as the target cohort were geographically widely dispersed, an online questionnaire was a cost-effective method of accessing the women, without being too intrusive whilst enabling a large number of responses in a reasonably short period of time. Furthermore, as the preliminary aim of the project was establishing the strength of the relationship between the women and their dogs, a quantitative approach yielding data which could be statistically considered would be most appropriate. Quantitative research, therefore, is defined in the context of this study, as the statistical analysis and interpretation of numerical information gained as a result of the assessment of a phenomenon (Muijs, 2012). The phenomena investigated being the relationship between dog and guardian, in conjunction with quality of life of the woman (with breast cancer), whereas qualitative research describes or classifies the quality or characteristics of a phenomena or enigma (Howitt, Dennis and Cramer, 2011), a definition which captures the focus of phase II.

Whilst a quantitative approach traditionally forms the basis of a positivist paradigm, as this research was incorporated into a pragmatic mixed methods approach, attempts to reduce bias, "a systematic error in data collection or analysis, caused by inadequate technical procedures" (Payne and Payne, 2004) were instigated; these included ensuring accurate reporting of the findings, and analysis of the data generated. However, it is acknowledged that selection bias (Yvonne Feilzer, 2010) was inherent

in the study as women who valued the relationship with their dogs and who had access to social media were targeted, this acknowledgement is in line with the requirements for transparency and reflexivity inherent in a pragmatic approach (Klockner *et al.*, 2021).

4.4 Rationale and selection of research instruments

Having elected to utilise a questionnaire, consideration was given as to whether the questionnaire needed to be of an original design or whether a known and recognised scale may be more appropriate.

There are advantages and disadvantages of both approaches. Benefits being that a published pre-existing questionnaire, especially one with a high (0.80-0.90) Cronbach score will have proven reliability (Tavakol and Dennick, 2011). Cronbach score / alpha / coefficient is a mathematical calculation of “internal consistency” indicating whether all components of a measure assess the same concept, a higher score implies a more reliable tool (Tavakol and Dennick, 2011). Additionally, application of a recognised tool should ensure results are reproducible, comparable i.e. valid, hence the tool is fit for purpose, and can be employed to detect small changes over time i.e. sensitive (Brophy *et al.*, 2008). Use of a tested measure may also reduce the burden of time required for the administration and interpretation of scoring the questionnaire, plus initial tool development (*ibid*, 2008). Within the UK this can be aided by the existence of question banks that can be readily accessed (The UK Data Service, 2019); additional banks are available worldwide (Wolf *et al.*, 2016).

It is, however, crucial that the researcher is fully versed in how a questionnaire being considered for inclusion has been employed previously, the context of any previous research and any recommendations stemming from its use (Hyman *et al.*, 2006). It should also be appreciated it will have been developed for application with a specific cohort, so some aspects may not be so relevant when administered to a different group, in which case amendments are feasible (*ibid*, 2006). Having ascertained an established scale would be preferable, consideration was given as to which if any scale would be appropriate and allow for collection of the desired data.

4.4.1 Selection of instrument to measure dog-guardian relationship

There are 71 scales developed to measure human-animal relationships (Anderson, 2007); some are species specific, some only relevant to domesticated pets, some are more biased to the animal’s perspective, others more focussed upon the human viewpoint of human-animal dyad (Anderson, 2007).

The Lexington Attachment to Pet Scale (LAPs), a tool developed in the early 1990s (Johnson *et al.*, 1992) has been extensively tested, (Anderson, 2007) mainly outside of the field of oncology, although more recently it is becoming popular for inclusion in cancer related studies. LAPs integrates elements of three pre-existing scales (Anderson, 2007); the CAB (Companion Animal Bonding) Scale (Poresky *et al.*, 1987), the PAS (Pet Attitude Scale) (Templer *et al.*, 1981), and the PAI (Pet Attitude Inventory) (Wilson *et al.*, 1987), and is a scale designed to assess the relationship between human and pet guardian, as such is not species specific (Anderson, 2007).

In regard to oncology, the researcher identified three studies employing LAPS, (Larson *et al.*, 2010; Ingram and Cohen-Filipic, 2018; Currin-McCulloch *et al.*, 2023). Larson and colleagues, (2010) assessed whether those at end of life were concerned about the impact of their relationship on their animals, Ingram and Cohen-Filipic, (2018) considered the links between depression, wellbeing and guardianship in a cohort of individuals living with cancer, whilst Currin-McCulloch and colleagues, (2023) employed LAPS in their two part study assessing “pet owner experience during breast cancer treatment and survivorship”, and “pets’ roles as emotional buffers and stressors” (Kogan *et al.*, 2023). Another scale utilised in an oncology setting is the Pet Attitude Scale (Templer *et al.*, 1981). Fleishman and colleagues, (2015) used this tool in conjunction with FACT-G (Cella *et al.*, 1993) to gauge wellbeing in relation to “animal-assisted visits” for people with head and neck cancer during chemotherapy or radiotherapy outpatient appointments, whilst the therapy animal employed in this study was a dog, it is acknowledged LAPS (Johnson *et al.*, 1992) is not a species specific measure (Anderson, 2007).

Having reviewed these measures, their appropriateness to the research being executed, and usage in previous studies a decision was made to utilise a modified version of another tool, the Monash Dog Owner Relationship Scale (MDORS) (Dwyer *et al.*, 2006); this instrument is species-specific, and focused on the human aspect of the dog-guardian relationship.

The Monash Dog Ownership Relationship Scale (MDORS) was developed in 2003 (a paper charting its development was published in 2006 (Dwyer *et al.*, 2006) by a doctoral research student Fleur Dwyer as part of her PhD studies, it has subsequently been employed in a number of surveys and has been found to be a reliable and valid scale, stringently tested and based upon rigorous methodology (Dwyer *et al.*, 2006). Dwyer and colleagues., (2006) developed the measure with the intention to provide a scale which could accurately measure and quantify the strength of a human-dog relationship; additionally, establish the contribution of emotional aspects, physical interaction and felt outlays (practical considerations, financial expenditures, time impacts) upon the human-dog dyad. In designing the scale Dwyer and colleagues, (2006) aimed to produce a scale that enabled an in-depth analysis of dog-owner relationship rather than produce a scale which permitted cross

species owner relationship comparisons. Acknowledging preceding the development of the MDORS, scales did exist assessing human and dog behaviour, Dwyer and colleagues, (2006) believed theirs differed in that it was a species-specific scale, assessing both positive and negative viewpoints of dog ownership, and although related to previous scales which were based upon human psychometrics, took the then contemporary knowledge and understanding of human and animal behaviour and applied it to the human-dog dyad.

The original MDORS (Dwyer et al., 2006) consists of twenty-eight questions loosely based around the Social Exchange Theory, a theory which propositions “interactions proceed from the assessment of costs versus benefits” (Lavrakas, 2008). Questions included in the MDORS were derived through literature review and focus group discussion analysis, followed by the piloting of a prototype questionnaire, further refinement of the tool, and subsequent administration of the questionnaire to 1125 study participants (Dwyer et al., 2006). Results were then statistically scrutinised, and the final scale established, which was assessed for reliability using the Cronbach’s coefficient (Tavakol and Dennick, 2011). Reliability was found to be good for the EC subscale (0.84) and PC subscale (0.84), the first section of the questionnaire assessing dog-human interface (DOI) was assessed as being sub-optimal (0.67); however, the section questions were incorporated into the final instrument as the authors felt the tool was straightforward, quick to complete and could be modified, suggesting additional questions could be added if further assessment was required. In regard to the use of the MDORS (Dwyer et al., 2006) in the current study, the second part of the questionnaire was considered more pertinent when assessing the effects of cancer upon the relationship with the dog, it was therefore agreed the scale’s reliability was acceptable.

Furthermore, nine studies employing MDORS (Dwyer et al., 2006) were reviewed, all these studies featured cohorts predominantly composed of female participants, including one that exclusively focussed on women (Handlin et al., 2012). This evidence suggests appropriateness of the tool for use in a woman only study, as in the current research. The cohort size in which the MDORS (Dwyer et al., 2006) has been employed ranges from 10 (Handlin et al., 2012) to 1140 (Calvo *et al.*, 2016), demonstrating its suitability of use within various cohort sizes. Whilst the average age of respondents differed across the studies, 8 of the 9 studies included participants were in their thirties to fifties. Additionally, the scale has also been successfully utilised with an older cohort (Bennett *et al.*, 2015), indicating its applicability across a wide age range.

In each study MDORS (Dwyer et al., 2006) has been used in conjunction with additional instruments. Three of these studies have employed measures of quality of life; Bennett and colleagues, (2015) assessed psychological wellbeing in relation to being in the presence of a companion animal within a cohort of older persons, combining application of the MDORS (Dwyer et al., 2006) with seven “wellbeing” assessments. Findings indicated no significant relationship existed (when comparing individuals with or without a pet) between wellbeing and the MDORS (Dwyer et al., 2006) or any of the other psychometric tests. However, it was identified that regular presence of a pet may be associated with an increased sense of wellbeing. It should be noted that the term “pet” is used as the study incorporated participants with a diverse range of animals, only those who were dog guardians (33 of the 68) completed the MDORS (Dwyer et al., 2006). Similarly, Calvo and colleagues, (2016) employed the MDORS (Dwyer et al., 2006) in combination with a quality of life assessment, the Cantrils’ Self Anchoring Scale (Cantril, 1965), a single question scale requiring a response, followed by asking individuals to position themselves on a hypothetical ladder of “satisfaction with life”, (Cantril, 1965; Deaton, 2018), whilst they observed individuals with dogs exhibited a marginally higher satisfaction with life score, 7.03, compared to the population average of 6.32, the only statistically significant association identified was with the demographic variable of education and EC, as measured with the MDORS (Dwyer et al., 2006), reporting “highly educated men” were able to forge “stronger emotional links with their dogs”.

More recently the EC subscale of the Cat/ Dog Owner Relationship Scale, evolved from the original version of the MDORS (Dwyer et al., 2006; Rohlf et al., 2024), developed as a tool for use in a wider range of contexts (Howell *et al.*, 2017), was employed in a study assessing mental health, coping mechanisms, and reactions to a pandemic, during the Covid 19 outbreak. The cohort predominantly comprised of females, the majority being dog guardians. Findings revealed that during the pandemic, a heightened EC was associated with marginally increased psychological distress, this they postulated may have been due to pet guardians being more “vulnerable to poorer mental health outcomes than non-guardians”. These findings, along with the aforementioned studies, provide support for the utilisation of the MDORS (Dwyer et al., 2006), not only alongside supplementary instruments, but also those designed to assess quality of life. Additionally, it is interesting to note EC was analysed as a standalone scale in this study, mirroring the approach adopted in the current research, thereby suggesting feasibility of employing use of the individual criteria under comparable circumstances, as indicated by Dwyer and colleagues, (2006) in their original study. Similarly, the PC scale was successfully used independently in the study executed by Bouma and colleagues, (2020).

On a smaller scale Handlin and colleagues, (2012) used the MDORS (Dwyer et al., 2006) as part of their investigation assessing the link between dog guardianship and levels of canine and guardian oxytocin. Examining the levels of neurochemicals, in relation to the MDORS (Dwyer et al., 2006), they found little relationship, however they did identify increased frequency of kissing the dog (question 2 in the current study) did correlate with raised oxytocin levels of the guardian. Moreover, they ascertained elevated oxytocin levels in both dog and guardian were directly influenced by human-dog interaction. This implies the MDORS (Dwyer et al., 2006) is applicable across a variety of contexts including those of a more scientific nature.

Further to the original study and those employing the measure with dogs within other studies, Payne and colleagues., (2015) re-evaluated the MDORS (Dwyer et al., 2006) in relation to other instruments that have subsequently been developed, they determined the scale remains current and applicable, and its reliability has been further enhanced. It should be noted there are criticisms levelled at it, in terms of it being biased to the emotions of the human side of the relationship rather than taking into account the cost of the relationship from the dog's perspective (Payne *et al.*, 2015), although it has been employed successfully in the following studies focussing upon dog related factors, including those associated with health behaviours and dog care (Rohlf *et al.*, 2012), responsible dog guardianship (Rohlf *et al.*, 2010), dog acquisition (Bouma *et al.*, 2020), and owner versus stranger dog behaviour (Rehn *et al.*, 2014). However, in respect to this doctoral study the focus upon emotional aspects were viewed as positives, as the psychological status of the women with cancer were of particular interest and not having a perception of the dog's experience did not detract from the instrument's usage.

Summary of scale to measure dog guardian relationship employed in current study:

The scale used in this research is a modified version of the MDOR's (Dwyer et al., 2006) consisting of 25 of the original 28 items of assessment; in this respect it is similar to the version employed by Handlin and colleagues, (2012).

In the version employed in the current study the following questions were omitted; omission was in agreement with the rationale proffered by Handlin and colleagues, (2012).

“My dog gives me a reason to get up in the morning. (Emotional Closeness) “

Omitted due to the ambiguity of the question and the fact that this may be an advantage or disadvantage depending upon interpretation (Handlin et al., 2012).

“There are major aspects of owning a dog I don’t like. (Perceived Costs)”

Omitted due to the ambiguity of the question and the fact that this may be an advantage or disadvantage depending upon interpretation (Handlin et al., 2012).

“How often do you take your dog in the car? (Dog-Owner Interaction)”

Omitted as this would require the researcher to make an assumption that all dog owners drive / have access to a car (Handlin et al., 2012).

Additionally, the following questions response options were amended, to reflect the extent of positives or negatives of each statement, as it was felt the frequency was of interest, and the once-a-year response was too broad to be of value.

How often do you tell your dog things you don’t tell anyone else? (EC)

1 = never, 2 = once a year, 3 = once a month, 4 = once a week, 5 = once a day (Original)

1 = never, 2 = once a month, 3 = once a week, 4 = once every few days, 5=at least once a day (New)

How often do you feel that looking after your dog is a chore? (PC)

1 = never, 2 = once a year, 3 = once a month; 4=once a week; 5=once a day (Original)

1 = never, 2 = once a month; 3=once a week; 4=once every few days; 5 = at least once a day (New)

How often do you feel that having a dog is more trouble than it is worth? (PC)

1 = never, 2 = once a year, 3 = once a month; 4=once a week; 5=once a day (Original)

1 = never, 2 = once a month; 3=once a week; 4=once every few days, 5=once a day (New)A

4.4.2 Selection of instrument to assess quality of life

There are eight recognised and reliable tools designed to assess quality of life in women with breast cancer (Maratia *et al.*, 2016). Maratia and colleagues, (2016) evaluated each of these patient reported outcome (PRO) measures within seven categories assessing reliability, validity, whether the tool was fit for purpose, whether it could effectively be used to determine changes over time, whether it could be easily translated and applied, how easy it was to interpret the scoring, how resource intensive it was to administer and whether it could be applied in different contexts, i.e. via online means or over the telephone; using an instrument the EMPRO (Evaluating Measures of Patient Reported Outcomes tool), itself tested for reliability with a Cronbach coefficient of 0.95 (*ibid*, 2016).

Having initially identified each of the tools via a systematic review for each instrument; the EORTC BR (European Organisation for Research and Treatment of Cancer Breast) tool (as used by (Meraner *et al.*, 2009), the IBCSG (International Breast Cancer Study Group) , the WHO-QOL BREF (World Health Organisation Quality of Life Brief) (as used by (Ávila *et al.*, 2015; Binotto *et al.*, 2017), the SF-36 (Short Form Health Survey Questionnaire) (as used by (Wells, 2009; Toroudi and Kazemian, 2018), the FACT-B (Brady *et al.*, 1997) (as used by (Brennan *et al.*, 2016; Pettiford *et al.*, 2017), the LSQ (Life Satisfaction Questionnaire), the QLICP (Quality of Life Instruments for Cancer Patients) and the SLDS-BC (Satisfaction with Life Domains – Breast Cancer), the overall EMPRO score, and score for each sub-category was calculated (Maratia *et al.*, 2016). EMPRO analysis indicated FACT-B was the highest scoring tool overall, scoring 79.27 out of 100 possible points, in addition it was also rated highest in the “concept”, “interpretability” categories and equal highest with the WHO QOL BREF, in the “reliability” section (*ibid*, 2016).

Maratia and colleagues, (2016) concluded FACT-B (Brady *et al.*, 1997) was to be the recommended instrument for assessment of quality of life in breast cancer, with the caveat that other tools i.e. EORTC, BR-23, IBCSG and WHO QOL BREF which also scored highly in specific categories, may be more appropriate for assessment of certain QOL dimensions (Maratia *et al.*, 2016).

Following review of the EMPRO assessment (Maratia *et al.*, 2016), and evaluation of the available instruments, it was decided, based upon the reliability and validity (as demonstrated by the Cronbach alpha of 0.90) and recognised advantages of FACT-B (Brady *et al.*, 1997), to incorporate it into the second part of the questionnaire, to enable assessment of the quality of life of the women, potentially also to facilitate the determination of any correlation between the MDORS (Dwyer *et al.*, 2006) and FACT-B (Brady *et al.*, 1997) data generated. By registering with the FACIT.org, (2024) full access was obtained, and permission granted to use the FACT-B (Brady *et al.*, 1997) questions and scoring criteria as part of the current study (see Appendix 2).

FACT-B (Brady *et al.*, 1997) is a cancer site specific version of the Functional Assessment of Cancer Therapy – General (FACT-G) instrument (Cella *et al.*, 1993), a quality-of-life assessment tool created in 1993, which has been employed in over 700 published studies (FACIT.org, 2010); it currently exists in more than 100 formats, and in over 80 languages (FACIT.org, 2024). Introduced and validated in 1997 (Brady *et al.*, 1997), to date, FACT-B has been employed in multiple studies authorised by the

Functional Assessment of Chronic Illness Therapy (facit.org) organisation. FACT-B (Brady *et al.*, 1997) is composed of two sections, FACT-G (Cella *et al.*, 1993) which comprises cancer generic or non-site-specific questions assessing general aspects of quality of life for any individuals with a diagnosis of cancer, and the “B” part, 10 additional questions focussed upon aspects particularly relevant to living with female breast cancer, for example “one or both of my arms are swollen or tender”, “I am able to feel like a woman”, each question requiring a respondent to score it between 0 and 4, 0 being “not at all” and 4 representing “very much” (Brady *et al.*, 1997). FACT-G although originally developed to quantify the effects of cancer therapy on physical, emotional, social / family, and functional wellbeing (Cella *et al.*, 1993), has also been successfully utilised in studies (Henderson *et al.*, 2012; Marino *et al.*, 2013) where quality of life has not been in relation to active cancer therapy / treatment but considered in respect of cancer survivorship.

To the best of the researcher’s knowledge, FACT-B (Brady *et al.*, 1997) has not been tested in relation to AAI or the support afforded by companion animals, as all studies to date namely Fleishman and colleagues, (2015) and Ingram and Cohen-Filipic, (2018) have employed FACT-G (Cella *et al.*, 1993) or the abridged version of FACT-G (Cella *et al.*, 1993), FACT-G7 (Yanez *et al.*, 2013). For example, Kogan and colleagues., (2023) utilised FACT-G7 (Yanez *et al.*, 2013) in their investigation into the impact of pets in a cohort of women with breast cancer. Therefore, as FACT-G (Cella *et al.*, 1993), which may be considered a derivative of FACT-B (Brady *et al.*, 1997), has been successfully utilised to assess the effects of dog interaction in groups of individuals with cancer, coupled with the recognition and validation of the measure, lends suitability to its use as an appropriate tool for the current study.

The questionnaire was divided into two sections. The first part included questions designed to gather demographic data about the women and their dogs. Participants with more than one dog were asked to base their response in reference to their favourite dog, as per Thompson and colleagues, (2018) who identified this was the most effective strategy. Section two incorporated the selected tools, the modified MDORS (Dwyer *et al.*, 2006; Handlin *et al.*, 2012; Howell *et al.*, 2017) and FACT-B (Brady *et al.*, 1997). The final version of the questionnaire, produced in electronic format using Qualtrics, (2019), was disseminated via social media through the “snowball” technique (Baltar and Brunet, 2012), consistent with the sampling method discussed in the subsequent section.

4.4.3 Sampling and target population

In determining the population being surveyed the following factors were considered; fundamentally, to be able to address the research objectives, the cohort needed to be composed of women who had breast cancer and were dog guardians. Whilst it is possible some perception of quality of life of women with breast cancer who had dog guardianship could have been gained from another cohort,

for example healthcare professionals caring for the women, the data generated would have been compounded by inaccuracies, uncontrollable variables, and would have been based entirely upon the opinion of a third party and consequently devoid of academic rigour.

Women with breast cancer were selected as the population of interest as it is the commonest cancer in women (Office of National Statistics, 2018; CRUK, 2024). Although it is acknowledged that breast cancer can present in men, this would be considered rare and accounts for less than 1% of all cases (Fentiman, 2016), approximately 390 cases in the UK per annum (CRUK, 2019). Therefore, for the purposes of this study all participants were female.

The prevalence of breast cancer is correlated with increasing age, a significant increase is observed amongst individuals aged 50 and above (Office of National Statistics, 2018). The National Screening Committee (GOV.UK, 2024) recommendations cite the 50-70 age group as being the optimal demographic for the detection and treatment of breast cancer (Independent, 2012), therefore, the target group for the research was women with breast cancer aged 50 to 70 years. It is also known that coping mechanisms differ between genders; men tend to disengage and relieve stress through sports and solitary activities, whilst women are more inclined to talk and share their concerns (Taylor *et al.*, 2000). A Macmillan publication “Facing the fight alone” (Macmillan Cancer Support, 2013) identified women are more likely to feel isolated and lacking support than men. Additionally, dog guardianship is more prevalent in households where females reside (Murray *et al.*, 2010), and households containing an older woman have a greater probability of having a canine companion (Westgarth *et al.*, 2007). Therefore, the target population for the initial phase (phase I) of the research were females, aged 50-70 years, who had breast cancer and were dog guardians.

Due to resource constraints and to avoid variables associated with cultural and regional differences, the women were also located within the United Kingdom; women were asked to confirm residency as part of the demographic data capture. In line with a pragmatic approach (Yvonne Feilzer, 2010) it was accepted there would be some homo- and hetero-geneity of the sample group (Daniel, 2012, pg.10). Therefore, to permit comparison whilst functioning as a screening mechanism for selection to phase II, and the narrative analysis, the primary function of phase I, the anticipated variables, marital status, year of cancer diagnosis, stage of breast cancer, treatment status, geographical region of UK residency, confirmation of dog ownership, number of dogs, years dog owned, breed of dog, and age of dog, were incorporated into the demographic information within the questionnaire.

4.4.3.1 Sampling

Sampling is a complex concept (Sadler *et al.*, 2010), founded upon positivist constructs (Park *et al.*, 2020) providing a method for the empirical determination of the required sample numbers (Walters *et al.*, 2001), to enable the research being executed to be generalisable and representative of the cohort or subset of a target population (Sedgwick, 2013). The cohort or sample size is therefore the number of participants required or desired to provide a statistically appropriate response within the research (Salkind, 2010); statistically appropriate may be interpreted as the number of participants sufficient to permit comparisons or generalisations (Collins *et al.*, 2007). A pragmatic approach does not demand such a high degree of determination (Kelly and Cordeiro, 2020), generalisations are not desired and comparisons whilst potentially interesting, not essential; rather it requires the researcher to be transparent about the sampling method applied (Klockner *et al.*, 2021), and ensure the sampling enables the aims and objectives of the study to be met (Sadler *et al.*, 2010), therefore in determining the sample the rarity and relative availability of the population requires consideration, as particular methods are recommended dependent upon these factors (*ibid*, 2021).

It is acknowledged the cohort is not rare, there are known to be approximately 55,200 women in the UK with breast cancer (CRUK, 2019), of these approximately 34,000 are women aged 50 -70 years (*ibid*, 2019). Therefore, based on Asher and colleagues, (2011) figures and their estimation of a 40% prevalence of dog guardianship in UK households, and assuming only one woman per household has breast cancer, this could conceivably equate to 13,600 women across the UK who are both diagnosed with breast cancer and serve as dog guardians. However, this study was a quantitative exploratory investigation rather than designed to prove / disprove a hypothesis. The results, whilst needing to be credible in relation to the specific members of the cohort studied, did not need to be conclusive, only that inferences could be drawn, no direct comparisons or statistical correlations were required for either phase of the study to satisfy the objectives. Therefore, being mindful the cohort was composed of vulnerable adults who had a diagnosis of a life limiting illness, and the subject being examined could be emotive (Morris, 2015), despite the relative abundance of potential participants, the study numbers were kept small, rather than aiming for a non-exploratory whole population-based survey (Daniel, 2012).

In establishing this quotient (Campbell *et al.*, 2020), it is imperative ethical issues be considered, particularly the burden on the participants, known as respondent burden (Salkind, 2010), an issue which has been explored within the previous chapter. Therefore, as participants were anticipated to have varying levels of health, potentially be coping with treatment side effects, regularly attending hospital outpatient appointments, and undertaking other tiring, and time rich activities, it was the responsibility of the researcher to select the smallest cohort so that the objectives of the study could

be met and the burden on the participants lessened (Ruel *et al.*, 2016). Furthermore, it should be acknowledged that the focus of the research was potentially emotive, therefore respondent numbers were moderated to minimise any potential distress (Morris, 2015). Based on this analysis, a purposive approach (Jupp, 2006; Gillham, 2008) enabling collection of a non-probability (Sedgwick, 2013) convenience sample (Heckathorn and Cameron, 2017; Campbell *et al.*, 2020) was adopted, whereby the sample was generated through a modified snowball or respondent driven technique (Sedgwick, 2013), a method incorporating a reliance on an original convenience sample to reach out and share details of the research with others (Goodman, 2011), a process known as “network linkage” (Heckathorn and Cameron, 2017) in conjunction with a form of “matrix sampling”, a technique whereby interested parties or gatekeepers control the distribution of the recruitment material (Campbell *et al.*, 2020).

This technique is inherently biased (Sedgwick, 2013); however it has been used successfully in situations where representative samples of an entire population are not necessary (Sadler *et al.*, 2010), it is a cost effective mechanism which potentially permits access to vulnerable or “hidden” populations (Sedgwick, 2013), furthermore, as participants are self-selecting, it is suggested they are more likely to remain committed to completion of the entire study, especially with more longitudinal approaches (Campbell *et al.*, 2020). It does, however, initially rely on personal networks (Sadler *et al.*, 2010), hence, in this research was combined with direct contact to the support group gatekeepers.

Respondents were invited to share the survey, so recruitment to the project widened and the response expanded or “snowballed” (Given, 2008). The desired response was not predetermined, but was governed loosely, by a rubric established prior to initiation of the data collection (Daniel, 2012), based upon minimums not maximums (Campbell *et al.*, 2020). Consequently, questionnaire responses were collected based upon a combination of the following criteria: a minimum three-month data collection period, a minimum of ten respondents requesting to participate in phase II of the study, thereby, enabling a minimum of four case studies to be developed. In addition, the study was constrained by several factors associated with resources in terms of funding, time, personnel and equipment.

The following points were therefore considered when determining the sample size, the nature of the study, the importance of the credibility of the results, the rarity of the cohort, factors associated with the specific population including vulnerability, resources available, the design of the study and proposed analysis (Daniel, 2012). Consequently, the decision to curtail data collection was based upon the response rate, the suitability of the responses for further analysis, the willingness of the

individuals to further engage in the study, time limitations and factors associated with the social and economic climate at the time.

4.4.3.2 Recruitment to the study

Participation in the research was on an entirely voluntary basis, (Lavrakas, 2008) the research cohort were self-selecting (Campbell *et al.*, 2020). Participants in phase I were recruited through social media platforms, (Roberts, 2014), facilitated by a press release, flyers, (see Appendix 7) and Facebook posts (see Appendix 8). Additionally, breast cancer support group leads, as gatekeepers were contacted directly to permit sharing of details of the study amongst their members, enabling a snowball (Browne, 2005) recruitment to take place.

The use of social media in this way is a recent innovation but one which offers many opportunities to contemporary researchers (King *et al.*, 2014; Leighton *et al.*, 2021) some of these include being able to access participants geographically further spread (Baltar and Brunet, 2012) or those identified as vulnerable or hard to access populations (King *et al.*, 2014; Darko *et al.*, 2022), it is generally cost effective (King *et al.*, 2014), requires little expertise (Darko *et al.*, 2022) and is readily accessible to the majority of researchers (Browne, 2005). Negatives of employing such a strategy are that it may not be accessible to all representations of the population being surveyed, especially the older generation who may not be so versed in its use (Darko *et al.*, 2022), it is also less personal and therefore “participant rapport” may not be generated to the same extent as would be for an in-person data collection (King *et al.*, 2014); however, as a complementary tool its use is recommended (Darko *et al.*, 2022), especially where the study is “exploratory” (Baltar and Brunet, 2012).

King and colleagues, (2014) offer suggestions to enhance the effectiveness of social media engagement, these include minimising the length of the questionnaire or required engagement with the website, recommending a maximum duration of 40 minutes, suggesting respondents often participate in surveys whilst multitasking, or relaxing so reducing the amount of time commitment required is beneficial. Additionally incorporating images into posts can be an effective way of attracting attention, stimulating interest to participate (*ibid*, 2014). Whilst the integration of a dedicated website in conjunction with Facebook posting (Leighton *et al.*, 2021) allows for signposting or provision of additional information (King *et al.*, 2014), where this includes the participant information, users can promptly determine their eligibility without the need to access the main survey platform, thereby potentially increasing completion rates. Hence, potential participants were invited via the flyer, social media post or website to link to the on-line questionnaire, initially situated on the Qualtrics system (Qualtrics, 2019) and subsequently moved to Jisc (Jisc, 2024). Participants

first accessed the participant information (see Appendix 3), this was followed by the consent form (see Appendix 4), upon providing an affirmative response to all consent questions, participants were then able to continue to the research questionnaire (see Appendix 5). Having completed the questionnaire which was estimated to take a maximum of 20 minutes, respondents were invited to provide their contact details if they were willing to potentially participate in the individual interview aspect of the study.

Selected participants based upon the algorithmic criteria, initially determined as an average of both EC and DOI score of 4 or more within the MDORS, and a FACT-B score of more than 80 were contacted as it was anticipated this would potentially identify participants who indicated their dog had a positive effect on their emotional wellbeing. Ingram & Cohen-Filipic, (2018) identified individuals with a closer relationship to their dogs, who were not receiving active treatment, had fewer depressive symptoms. Whilst it is recognised overall QOL has not been proven to be directly related to attachment to a pet, both Binotto and colleagues, (2017) and Ingram and Cohen-Filipic, (2018) established women pet guardians scored higher in some QOL psychological domains. Therefore, this initial algorithm determined, with the understanding that being of pragmatic design, the adaption of the method was permissible. Phase II eligible respondents were subsequently invited to participate in individual discussions (phase II), this invitation was sent via email accompanied by the phase II participant information sheet (see Appendix 14).

Following the phase I data collection period and compilation of the results from the two online data capture systems Qualtrics, (2019) and Jisc, (2024), data analysis was initiated. It should be noted however that during the data collection there were several unforeseen influences which affected both the resultant method and data collected. These are summarised in the following section.

4.5 Unforeseen circumstances and the pragmatic approach

The data collection commenced in September 2019, in March 2020 the WHO declared a pandemic status, in the UK this resulted in a period of two years of uncertainty that included two national lockdowns; whilst this did not directly impact the data collection, as the sampling method employed social media, it could have posed significant challenges had in-person completion of the questionnaire been required. Social distancing measures and the postponement of some hospital appointments would have made hospitals, which were potential alternative avenues for data, collection difficult to access. However, due to the significant impact on health services and cognisant with the distress this may have resulted in for the already vulnerable cohort, coupled with the viability

of the breast cancer support groups, the researcher in accordance with the pragmatic approach adjusted the methodology.

The original plan for phase II involved conducting in-person interviews, therefore participants from the Midlands locality were initially targeted for inclusion, due to logistics, i.e. cost and travelling to complete in person visits. In light of the ongoing pandemic during the data collection and the recognition in person visits would not be viable, the decision was made to widen the geographical target area to include the entire UK. This expansion not only increased the potential respondent pool but impacted upon the subsequent phase of the study as individuals agreeing to participate in phase II were now geographically dispersed; this was probably advantageous as it also ensured phase II could be completed. Additionally, the unexpected transition in survey platform, in November 2020, resulted in not only a pause in the data collection whilst the Qualtrics survey data was retrieved and reformatted to meet the specifications of the Jisc system, but then required the researcher to ensure the correct survey link was on the latest posts and information. There is, therefore, a possibility some potential respondents who accessed the survey via the older link tried unsuccessfully to complete the survey on Qualtrics, (2019), consequently, potential participants may have been missed. However, whilst these changes were challenging, the pragmatic approach adopted accommodates such difficulties and it was determined these adjustments did not impact the overall outcomes of the study or quality of the research output.

4.6 Data Analysis – Phase I

Data analysis is the process of interpretation and understanding of data that has been retrieved during the data collection period (Coghlan and Brydon-Miller, 2014). The interpretative methods applied to the data may be descriptive or statistically focussed (Nishishiba *et al.*, 2014). Data from phase I was quantitative and as such, could have potentially been statistically evaluated, however as the primary function of the data was to allow screening for suitable candidates for selection to phase II, the analytical methods applied to this data were simple, permitting the development of descriptive statistics and assessment of relationship between a few key variables.

Data collection took place between September 2019 and May 2021, the last engagement with the questionnaire occurring in November 2020. During this period 39 individuals commenced the survey, of these 11 were incomplete submissions, and 1 respondent resided outside of the UK. There were twenty-seven participants in the final cohort who completed the survey in its entirety, 9 provided further contact details.

Results from the questionnaire consisted of two main data sets, one corresponded to the results of the modified MDORS (Dwyer *et al.*, 2006), the other to FACT-B (Brady *et al.*, 1997). Each scale was converted to numerical scoring using the scoring guidance provided with the measures. The modified MDORS (Dwyer *et al.*, 2006) was scored as per the scoring chart in Handlin and colleagues, (2012), (see Appendix 9), totals for each of the sections DOI, EC, and PC were determined, for each an average was calculated and the overall score ascertained through addition of all the averages (*ibid*, 2012). The complete scoring profile of FACT-B is protected by copyright (Brady *et al.*, 1997; FACIT.org, 2024), therefore not included within the thesis. In summary, FACT-B (Brady *et al.*, 1997) is scored by subtracting the individual question score 0 (not at all) to 4 (very much), from 4, then totalling the item response for each of the sections, (physical wellbeing (PWB), social wellbeing (SWB), emotional wellbeing (EWB), functional wellbeing (FWB) and the breast cancer sub-scale (BCS), multiplying it by the number of items in the section, and then dividing by the number of items responded to per section (*ibid*, 1997). All section responses are then aggregated, and an overall score (0-148) obtained, “the higher the score, the better the QOL” (Brady *et al.*, 1997).

Once the data had been collated and coded as explained above, (see MDORS scoring sheet Appendix 9) it was subject to analysis. Firstly, the respondents were allocated alphabetical synonyms to enable easy identification of the data pertinent to the participants going forward to phase II, and to keep a human perspective to the data. In line with a pragmatic approach, it was important to regard the respondents as partners not as subjects. Using an Excel spreadsheet and formula functions, results for each of the questions in the mMDORS were calculated. Columns were colour coded into the questions pertaining to each subscale DOI, EC and PC, the total of each subscale calculated through application of a formula, then divided by the number of questions within each category, to arrive at an average for each subscale (DOI, EC, PC) for each respondent. Whereas FACT-B was manually scored using the “FACT-B Scoring Guidelines Version 4” (FACIT.org, 2024), based on the questionnaire data contained on the spreadsheets, downloaded from the survey systems, Qualtrics and Jisc, this allowed for the generation of a score for each subscale (PWB, SWB, EWB, FWB, BCS), a score for FACT-G and FACT-B. Results for each participant were recorded on the overall responses spreadsheet (see Appendix10).

Results were then presented in the form of descriptive statistics and a summary of the demographic data recorded.

4.7 Results – Phase I

Results of the demographic aspect of the study indicated respondents' ages ranged from 38 years to 68 years, the median age was 52 years, mean age also 52 years. Sixteen participants were married, 3 cohabiting and 7 single, 1 respondent did not answer this question. The length of time since diagnosis ranged from 17 years to newly diagnosed, 5 respondents having been diagnosed the same year as the data collection, median time since diagnosis was 3 years and average 4 years. The majority (17) of respondents were at the time receiving systemic anti-cancer treatment in the form of chemotherapy, hormone therapy, and, or immunotherapy, 1 respondent was concurrently receiving chemotherapy and radiotherapy, 6 stated "other" and 3 respondents did not answer the question.

In regard to dog guardianship, 15 respondents were guardians of 1 dog, 7 had 2 dogs, 3 had 3 dogs, 1 had 4 dogs and 1 had 6 dogs. The most popular dog breeds of dog "owned" were labrador and terriers, with 5 guardians of each; next popular breed was spaniel, 3 guardians had these, then border collies, German shepherds, and whippets. Eleven other not so frequently mentioned breeds were also identified, it should be noted some guardians had several different breeds of dogs. Based upon time since diagnosis and age of the dog, 21 guardians would have had their current dog at the time of diagnosis, and 6 not been dog guardians, although it is recognised not all guardians would have had their dog since puppyhood and the guardians may have had previous canine companions.

Further descriptives were generated, including calculating the maximum, minimum and average of each subscale of both the mMDORS and FACT-B to enable comparison with reference data sets, (see chapter 8). Means of the mMDORS subscales were DOI 4.00, PC 1.62, EC 4.32, where the maximum means for each would be 5.00, whereas mean FACT-B subscales indicated PWB 19.81 (out of maximum 28.00), SWB 19.99 (out of maximum 28.00), EWB 15.93 (out of maximum 24.00), FWB 18.60 (out of maximum 28.00), BCS 22.06 (out of maximum 40.00).

Whilst the aim of the study was exploratory, and it was part of a planned sequential methodology the dataset although small was subject to further analysis and statistical evaluation. Using SPSS (Statistical Package for Social Sciences) by IBM (International Business Machines) the data was analysed to ascertain whether there was any evidence of a relationship (correlation) between datasets for the variables Emotional Closeness (EC) a subscale of the mMDORS and Emotional Well Being (EWB) a component of FACT-B, or EC and FACT-B or FACT-G.

Box plot generation allowed for determination of parametric or non-parametric alignment to enable appropriate application of correlation coefficient (Howitt and Cramer, 2014), whilst scatter plots

provided graphical representation of likelihood of existence of relationship (Burdess, 2010). Results indicated a shift from the normal distribution and presence of outliers therefore a non-parametric evaluation using Spearman's rho was executed (Mackridge and Rowe, 2018). Spearman's coefficient may be considered less powerful than parametric testing but may be used in circumstances where outliers exist (Howitt and Cramer, 2014). Additionally, due to the random distribution of data points the potential for a significant relationship between each of the variable combinations was considered low (Burdess, 2010).(see Appendix 11)

Statistical analysis confirmed this assumption. The following results were attained:

Relationship between EC (mMDORS) and EWB (FACT-B)

Spearman's Coefficient = 0.621

Relationship between FACT-B score and EC (mMDORS)

Spearman's Coefficient = 0.886

Relationship between FACT-G score and EC (mMDORS)

Spearman's Coefficient = 0.472

Corelation coefficients indicated there was no evidence to conclude a relationship existed or support an alternative hypothesis (Rumsey, 2023), although it should be acknowledged this result may be due to the small dataset of twenty-seven or variability within the data. However, whilst statistical analysis did not yield results of significance, the small dataset did permit further evaluation on a more individual basis, leading the researcher to complete a visual examination of the relationship between EC and EWB for each participant. To enable this a common multiple was established between the maximum scores of each subscale, this being 120, hence, the mean scores for mMDORS EC were multiplied by 24 for each participant, and the FACT-B by 5, the resultant chart is shown in Appendix 12 and discussed within chapter 8. This permitted the researcher to identify individuals who indicated they experienced high EC and EWB and others where there was a disparity between variables, resulting in a heightened interest by the researcher in further investigation of the factors impacting the individual scoring by the participants leading to, and lending credence to the desire to undertake further research and execute phase II of the study.

4.8 Conclusion

This chapter has explored the selection and application of the research instruments and methods employed during the quantitative data collection process, findings have been presented as predominantly descriptive statistics and the strategy for eligibility to phase II explained. Results enabled the identification of nine respondents willing to participate in the phase II of the study, these respondents were contacted and phase II initiated.

5 Phase II

5.1 Introduction

This chapter details the method applied during the qualitative component of the data collection, it offers an in-depth critical analysis of the case study approach and narrative analysis methods employed, re-storying is explored, and the purpose of narrative output discussed. Furthermore, the specific ethical aspects pertinent to narrative data collection are considered and the study safeguards explained.

5.2 Phase II method

Phase II utilised the phase I questionnaire as a screening tool, to allow for selection of a small group of women meeting the required criteria to be identified and invited to interview. This was initially intended to be framed upon those individuals who achieved an average DOI and EC ≥ 4 , and a FACT-B score ≥ 80 , as it was anticipated this would identify individuals whose wellbeing was potentially associated with having a close relationship with their dog. However, due to few of the respondents replying to the email invitation to participate in phase II, this approach was broadened to encompass all volunteering participants. Additionally, due to the prevailing pandemic at the time, the original plan to conduct video interviews in the participants' home with their dog present was adapted, participants were invited to produce their own narrative account either as a series of videos or a written account. This invitation was initially sent to the first group of participants, those with the highest EC, DOI and FACT-B scores; unfortunately, there was minimal interest in this technique within the first cohort, therefore, the second cohort of those who had requested to be involved in part II were only invited to participate in telephone recorded interviews.

Following completion of appropriate consent forms (see Appendix 15), two participants produced their own accounts prompted by written open question and guidance (see Appendix 19), plus two participants participated in an initial telephone-based interview framed around the same open question. The participants created accounts, one of which was a series of videos filmed over a period of a month and remotely uploaded to the university's SharePoint and another a written account received via email were subsequently transcribed, as were the later phone conversations which were recorded using a telephone on loudspeaker with a Dictaphone.

Following transcription and preliminary analysis, all participants were contacted and invited to a follow up interview, enabling the researcher to gain greater understanding of aspects previously discussed or shared, clarify any points and establish levels of wellbeing since the last engagement.

Both the original participants and one of the subsequent participants engaged in the interview; one of the later interviewees who had advanced disease at the time of the first interview was uncontactable, and in accordance with the ethical considerations previously discussed was not contacted again.

All secondary interviews were transcribed, and content generated through the different data capture methods for each individual amalgamated to form a coherent chronological account. These accounts were then “smoothed”, with content deemed not relevant removed, following analysis as explained in the next sections, from these final accounts the researcher created individual stories about each woman, an accessible depiction of their lived experience, which were shared with the respective women for their review and comment.

The case studies were further scrutinised using the narrative analysis techniques discussed later in this section and a comprehensive critical analysis of the psychological aspects emerging from case analyses completed, complemented by an analysis of the overarching themes which emerged. These themes form the basis of the discussion in chapter 8.

5.3 Case Study

A case study is an in-depth and comprehensive analysis of a case (Mills *et al.*, 2012), a case being a single entity; it could be a person, animal, event, or phenomena (Stewart, 2017), the only stipulation being it is constrained by clear temporal and spatial boundaries (Gerring, 2021). These temporal boundaries are usually longitudinal meaning the data is collected over a period. This time may be hours, days, months or even years, the period selected should be appropriate to the nature of the study and clearly specified within the research methodology (*ibid*, 2021).

As case study data collection is often observational or involves in depth interviews or immersion of the researcher in the environment, it is crucial from an ethical perspective to only “invade the privacy” and enter the individual’s environment or involve them in interviews for the optimal time required for effective and worthwhile data collection (Tight, 2017). This time frame is often determined by logistics, associated with the length of the phenomenon, the availability of the participants and overall length of the study period (Crowe *et al.*, 2011). Generally, the longer the study the more detailed the data collected, meaning the study involves several consecutive, or a continuous data collection period, such that the study spans a period of time or includes several discrete periods or events, as this will permit in case of variation (Gerring, 2021).

Case study analysis involves scrutiny on a minute intricate basis (Stewart, 2017). Whilst a single case investigated in depth, known as an intrinsic case study (Mills *et al.*, 2012), can be the foundation of a complex written study (*ibid.*, 2012) there needs to be sufficient data to permit this level of analysis, both within the case (case variation) and in relation to external reference sources. In gathering this data it may be appealing to collect data from many subjects or events; however, the danger with this approach is the information may be too voluminous, hence, due to time limitations of the study not analysed to the extent required to generate meaningful findings, or the data plentiful but not robust, and scrutiny narrow by purely a lack of quality or relevant data; sampling therefore, becomes a critical aspect of case study based research, requiring careful consideration (Crowe *et al.*, 2011).

There are several approaches to case selection. Random, a form of purely algorithmic selection from an entire population; often a gold standard for the majority of research, not advantageous in case study research as it risks missing out cases of interest and offers no flexibility (Gerring, 2021). Purposive case selection, the choosing of cases based upon them meeting a pre-defined criterion (Gillham, 2008), or a combined method using purposivity, in conjunction with an algorithmic approach (Thomas and Myers, 2015). This offers some randomisation, at the same time allows for best fit cases to be selected from a pool of cases meeting pre-determined criterion. To enable this choice the algorithm or range needs to be explicit, clearly specified within the methodology, and be applied consistently within the executed research (Tight, 2017). A mixed method approach was applied to the current study, with the cases first being identified through algorithmic selection from a preliminary quantitative data set (Small, 2009), later broadened to encompass all individuals willing to participate in phase II, leading to the development of nested case study analyses, which whilst supplemental to the initial study became the focus of the research, as the depth of the analysis of the cases was complex and minute. Even with complete transparency of case selection, some may still consider the method has lower value or less credibility (Stewart, 2017), however, as the aim of the study was to explore the subject in depth, not draw conclusions around causation or develop inference, the technique was considered acceptable and appropriate for the exploration of lived experience (Crowe *et al.*, 2011), and permitted an in-depth investigation not achievable through other methods (Mills *et al.*, 2012).

Usually, a case study will consist of a few individual cases, thus permitting not only analysis of in case variation but also some cross-case comparison (Mills *et al.*, 2012). The optimum number of cases included is determined by time limitations, availability of cases, depth of investigation and to some extent by the subject matter (Gerring, 2021). Four cases have been included within this case study allowing for familiarity with the case and comparability (Heale and Twycross, 2018) whilst permitting uniqueness within the cases (Kahwati & Kane, 2020).

Case study research allows an in-depth delve into a rich picture of life (Stewart, 2017); assuming appropriate questioning generates sufficient and relevant data. Other methods of data collection which could provide insight into the lived experience and may even inform a case study (Gerring, 2021) include focus groups, interviews, and open-ended written questions (Dahlberg and McCaig, 2010) however independently, these are unable to capture how meaning evolves over time, or permit exploration of complex issues (Yin, 2018). Whereas case study research incorporating narrative analysis which examines the lived experience of the researched, and the way they recount their experiences; the words they use, and the emotions conveyed within their speech or writing (Gerring, 2021) captures the nuances of the conversation and a more holistic picture of the situation.

Whilst the lived experience expressed within case studies, focus groups, interviews, or via written questions may be analysed through thematic analysis (with or without coding), discourse or conversation analysis (often through computer assisted means (Crowe *et al.*, 2011), rather than more manual methods of scrutiny), exploration of phenomena or hermeneutics, the potential of the individual voice to be lost through categorisation is increased (Guest, 2012. Pg.16). Hence a case study approach incorporating narrative analysis was selected as it permitted an in-depth exploration of the psychological aspects of wellbeing (Tight, 2017) whilst capturing the individual women's stories.

5.4 Narrative Research

5.4.1 Narratives

In its simplest form, a narrative is part of a story (Kim, 2020), an experience (Wang and Geale, 2015) or an account (Smith, 2001), usually created by an individual, often acquired through interview or pre-recorded or written source of information in response to a stimulus, which could be a question posed by a researcher, or documented, generating a thought (Earthy and Cronin, 2016). Whether the reply be verbal or written statement, narratives are generally co-authored (Andrews *et al.*, 2013), are only true at the point produced and focus only upon one individual's life (*ibid*, 2001), therefore, any output is not generalisable (Pino Gavidia and Adu, 2022); hence, it is proposed the term "transferability" is more appropriate (Lincoln and Guba, 1985). Furthermore, Denzin, (2001) suggests as a personal or lived experience can only be researched retrospectively because one's having to live the experience initially, what is researched in narrative research is only a representation of the event, not the event itself; however, more recently he has omitted the term "retrospective" from his definition as he recognises the recounted experience is a representation rather than a retrospective truth (Denzin and Lincoln, 2018).

5.4.2 Origins of narrative research

The origins of narrative research as a recognised field within the discipline of psychology emerged in the late 1980s, with Jerome Bruner (1915-2016) being one of the early psychoanalysts who spearheaded the development with his theories about “narrative construction of reality” (Bruner, 1991), leading to the “narrative turn” in the early 1990s, determining narrative as a key method of “organising human experience”; the comprehension of life through storytelling, and offering narrative as a theoretical perspective in an otherwise mainly positivist, empirically founded discipline (Bruner, 1991). Roy Schafer (1922-2018) also in the 1980s, whilst questioning some of the assumptions of Sigmund Freud (1856-1939), whose interpretation of the lived experience in relation to psychopathology may be considered a form of narrative analysis (Kim, 2020), recognised the subjectivity of personal history, drawing upon the collaborative nature of construction of meaning (Schafer, 1980). Both Bruner and Schafer may, therefore, be regarded as narrative constructivists, although applying the theoretical framework in different contexts, Bruner concentrated upon cognitive psychology (Bruner, 1991), whilst Schafer focussed upon psychoanalysis (Schafer, 1980). It is therefore unsurprising narrative analysis may be considered a social constructivist methodology (Lieblich *et al.*, 1998), quite a departure from the positivist (*ibid*, 1998) or the paradigmatic approach (Clandinin, 2007). Since the eighties, narrative analysis has been steadily increasing in popularity, offering a middle ground between modern and post-modernist approaches (Denzin, 2001).

5.4.3 The nature of narrative research

Narrative research refers to study involving the analysis of an account or part of a story offered by an individual, or a series of stories offered by a group of individuals (Gubrium and Holstein, 2001). It differs from thematic analysis as it takes the “raw” or original story or account and submits it to a process of interrogation, deconstruction, reconstruction (Pino Gavidia and Adu, 2022) and interpretation enabling the depth and meaning to emerge without the true account being lost, depreciated, or altered (Kim, 2020). It is a method of qualitative research incorporating narrative inquiry, a form of discourse, a way of making sense, bringing order, and meaning to the actions, events, experiences, history of self or others (Denzin and Lincoln, 2018); in doing so it challenges and crosses boundaries, and may be thought of as an interdisciplinary method allowing for the interpretation and analysis of lived experiences, offering an in-depth dive into a participant’s culture, beliefs, philosophies, and actions (Kim, 2020), capturing the uniqueness of each participant (Nasheeda *et al.*, 2019) and permitting a greater understanding of “being human” (Wang and Geale, 2015). Consequently, it often forms the basis of case studies, now considered as one of the pillars of modern medicine (Kim, 2020); allowing health professionals to develop a comprehensive understanding of an individuals’ perspective, its impact on the provision of care, and professional

relationships, enabling insight leading to the development of innovative solutions to health and social care challenges (Wang and Geale, 2015). It “goes beyond the written and oral” and interrogates the text in an empathetic and inquisitive way (Denzin and Lincoln, 2018, pg. 70).

5.4.4 Accounts, narratives and stories

Stories underpin everything an individual does, spanning every culture, every country, every society, and every aspect of life (Kim, 2020), enabling people to make sense of their experiences, gain different perspectives about a situation, collect and organise their thoughts, and develop accountability for their actions and interactions (Wang and Geale, 2015). Through stories, people learn about others, their experiences, their successes, and challenges in life. Stories are multifunctional being thought-provoking, entertaining, reassuring, inspiring, reinforcing, or as Kearney, (2002) suggests, may act as a way of sharing a plot, be a creation of reality, elicit cathartic release, provide wisdom and knowledge, or have an ethical purpose. Storytelling is both a social interaction and form of communication requiring an artistic approach to the telling of the tale to bring the account to life and set it aside from a less personal or simplistic report (Pepper and Wildy, 2009). It will always have the “handprint” of the designer or storyteller, this should be recognisable even after the interrogation and reconstruction process has been undertaken (Kim, 2020).

The distinction between a story and an account or narrative is subtle, although terms are often used interchangeably (Earthy and Cronin, 2016). Stories are complete, whereas an account or narrative may be a snapshot in time (Kim, 2020). Stories are also more ordered, usually having a beginning, middle and end, with several events interspersed throughout a timeline (Clandinin, 2013). Narratives are interconnected or intertwined forming a patchwork of life (Overcash, 2003). “Narratives constitute stories, and stories rely on narratives” (Kim, 2020). One similarity between a story and an account or narrative is they both require a storyteller to bring them to life, this may be through written or verbal means or a more performative or artistic form (Willig and Stainton-Rogers, 2008). To provide clarity the following terms will be used within this chapter, the “account” pertains to the original (part of the) story offered by the research participant, the “narrative” the final version of the account after it has been deconstructed and reconstructed (Pino Gavidia and Adu, 2022), the “analysis” the interrogation and interpretation, the “inquiry” the process undertaken during the analysis and evaluation of the account and the “story” the output of the research (Earthy and Cronin, 2016).

5.4.5 Derivation of the account

The account may be derived from a range of sources, including as in the current study, a research participant during an interview, a method frequently adopted by qualitative researchers as a component of a lived experience study (Denzin, 2001) or can be a pre-existing source of text or media. Pre-existing sources, which may in fact themselves be narratives, include autobiographies, autoethnographies, diaries, books, articles, leaflets, play scripts, or media including recorded interviews, films, and audio soundtracks (Andrews *et al.*, 2013). Whilst these may not appear co-constructed by the researcher they will have been influenced by another person/s, perhaps a publisher, interviewer, collaborator or co-author, anyone could have had an impact upon the account (Bruner, 1990). As such, a narrative is always constructed in relation to the context in which the account is being shared, therefore, constrained by it (Gubrium and Holstein, 2009). It is influenced not only by self, societal, and cultural values (Stapleton and Wilson, 2017) but also by the environment in which the narrative has been constructed (Gubrium and Holstein, 2009).

5.4.6 Acquisition of the account or story

Methods employed during the acquisition of the account require careful consideration and an empathetic approach (Çelik, 2012). A range of different acquisition methods exist, including, or with elements of, face to face interview in person or a virtual online meeting, written question and answer, video recorded responses without an interviewer present, and referral to historical or published accounts (Beal, 2013). Irrespective of method selected, generation of a detailed account of lived experience whilst strongly influenced by the creator's values, beliefs, and culture, is, due to the presence of the "interviewer", co-constructed (Earthy and Cronin, 2016). Therefore, prior to initiating any research, the researcher must thoroughly consider their role and position in the process and how the interviewing will be conducted (Morris, 2015).

Taking a reflexive approach allowing the researcher to evaluate the impact of self within the research process (Berger, 2015) led the researcher to employ a combination of data acquisition methods in the current study; the initial participants were invited to develop their own narrative account either as a series of videos or a written account, as it was felt this was a method closest to the original planned in person videoed interviews and least intrusive amidst the pandemic. However, due to low interest in this technique within the first cohort of volunteers, the second cohort identified were invited to participate in telephone recorded interviews. Hence, two participants produced their own accounts prompted by a written open question and guidance (see Appendix 19), one created a series of videos filmed over a month the other a written account. These two participants subsequently

engaged in a follow up telephone interview, whilst the second cohort of participants both completed an initial telephone interview and one latterly a follow up conversation.

5.4.7 Transparency

Transparency of the research process is essential in all studies, but especially important in narrative inquiry due to it being less constrained than more empirical norms of research (Denzin and Lincoln, 2018); therefore, it is fundamental the purpose of the research and the function of the output of the inquiry process i.e. the narrative, be made explicit to the participants as part of the consent process (Wong and Breheny, 2018). Narratives can have a variety of functions, acting as a vehicle for change, provide insight into a social injustice or a moral issue (Bold, 2012), help to highlight aspects of inequality (Briggs, 2003), illustrate power struggles (Livholts and Tamboukou, 2015), provide a window on a lived experience (Andrews *et al.*, 2013) or be a form of self-emancipation (Livholts and Tamboukou, 2015). It is the responsibility of the researcher to ensure that whilst the purpose of the narrative provides the foundation to the account gathering, this does not result in the “Hawthorne effect” with participants offering accounts they believe the researcher would like to hear or may empathise more with (O’Reilly, 2009). Likewise, whilst the researcher should always pay homage to the purpose of the data collection when interrogating and interpreting the data, they should approach the analysis with an open mind (Kim, 2020); although, it is acknowledged this will always be affected and influenced by the researcher’s pre-conceptions and pre-existing knowledge, beliefs and culture (Earthy and Cronin, 2016), for that reason it is important and expected the researcher will articulate these through a statement of beliefs, as shared within the introduction of the thesis, and employ ongoing reflexivity throughout the data collection, interpretation and entire project. The statement of beliefs is a clear account of the researcher’s position as regards their perspectives, experiences, and ethics, thus enhancing the transparency, academic rigour, and integrity of the research (Dodgson, 2019).

5.4.8 Attributes of the narrativist

To be an effective narrativist (Pino Gavidia and Adu, 2022) it is suggested the researcher needs to instil an ability of narrative thinking within their participants, this is the cognitive capability of the storyteller or interviewee to compile the pieces of their story (account) together in a coherent manner and provide the answers to the who, what, when, why, how questions, thereby composing their story and relating it to previous knowledge and experiences (Clandinin, 2013). They personally do not need to analyse their accounts but “paint a picture” enabling the researcher to make sense of their experiences, (Kim, 2020). This foundation of narrative thinking distinguishes narrative inquiry

from other forms of qualitative research; however, it is dependent upon the ability of the interviewer (Pepper and Wildy, 2009). The narrative researcher must, therefore, possess or acquire the following attributes; integrity, a fundamental quality of any researcher. The ability to develop a rapport with the participants and develop a trusting relationship (Gabbert *et al.*, 2021), which according to Grinyer and Thomas, (2012) is easier when executing a longitudinal study and may yield a deeper, more private account; an essential component of a successful interview. Conversely there is also a danger establishment of too great a rapport may lead to induction of bias within the interview (*ibid*, 2012). Therefore, determining the appropriate level of rapport is essential and demonstrating care and empathy during interactions fundamental, if the interview is to release the private account (Grinyer and Thomas, 2012; Gabbert *et al.*, 2021).

To successfully gain responses to questions around the lived experience a researcher needs to be a competent and empathetic interviewer and listener, taking the position of knowledge gatherer, learning from the expert (Anampa-Guzmán *et al.*, 2022). A narrative interview must allow freedom of expression, thus the methodology be designed to enable the narrative account to evolve (Bruce *et al.*, 2016) such that the interview can take whichever direction the interviewee so desires, like a stream finding its own route across a terrain with tributaries heading off in different directions (Kim, 2020). Consequently, there is need to provide both opportunity and permission for interviewees to tell their story (Bates, 2004). However, unlike traditional qualitative interviews, in narrative interviewing the balance of power shifts to the interviewee with the interviewer becoming motivator, empowering the interviewee to feel able and comfortable to share their story (Gabbert *et al.*, 2021). Therefore, when providing this starting point, whether through verbal or written means the researcher needs to be clear about the purpose of the study, conveying this with clarity to the participant (Wong and Breheny, 2018); hence, should have good communication skills both written and verbal, and appreciate they are going to be entwined in the research thereby influencing both research and findings (Clandinin, 2006).

This is a fine balancing act, necessitating the narrative inquirer to develop collaborative ways of working whilst also being aware of the vulnerability of both the participant and to some extent, self (Kim, 2020), requiring one to be able to apply empathy, sensitivity and understanding or reflective practice to the research process as it evolves or develops (Pino Gavidia and Adu, 2022). To enable this it is posited both reflection and reflexivity are fundamental concepts, reflexivity being critical reflection or scrutiny of the research process and the role of the researcher within it (Cassell and Symon, 2011). Furthermore, caring reflexivity, a maintenance of the integrity of the research and researcher through respect for dignity and integrity of the researched is recommended (Rallis and Rossman, 2010). Additionally, a narrative inquirer needs to be a philosopher, able to apply ethical

judgement, be familiar with theoretical frameworks and range of analysis methods, such that they may adapt to the evolving methodology and pragmatic nature of narrative research (Bruce *et al.*, 2016)

The researcher believes they approached data collection in an empathetic manner, recognising the vulnerability of the participants, contacting them only at agreed points during the project (to invite participation in phase II, to arrange initial interview or data generation and complete consent form, to arrange follow up interview, to invite review of own story), in the instance where response was not elicited as in the participant who has advanced stage cancer, further contact was not pursued. All interviews were conducted at a time and date arranged at the convenience of the participant, verbal consent additional to the written consent previously provided was requested and opportunity to ask questions before proceeding with the interview proffered. An hour was set aside for the interview, this had been conveyed in writing prior to interview but reiterated verbally before the interview commenced. As the interviews were conducted using a telephone on loudspeaker and recorded on a Dictaphone a quiet and confidential location was secured, and interruption minimised, thus providing the participants with respect, confidentiality, attentiveness, enabling the development of rapport (Gabbert *et al.*, 2021). Furthermore, the researcher employed empathetic listening (Sanders *et al.*, 2021), allowing and encouraging the participants to speak without interruption, was sensitive to any occurrences of upset and utilised their advanced communication skills developed within the “Connected” Advanced Communication Skills Training course (Wilkinson and Roberts, 2010).

5.4.9 From account to narrative

Prior to presentation of the final version of the narrative several steps required completion, these were the interpretive processes leading the researcher from the account to production of the narrative (Pepper and Wildy, 2009). Each stage offered the researcher opportunity to be reflective and reflexive and become familiar with the participant’s story. Initially the recorded video or audio was watched / listened to, then transcribed by the researcher, subsequently re watched / listened to and checked for accuracy. Transcription is a fundamental procedure which occurs as part of the interpretative process, as Riessman, (1993) posits, in reviewing the interview or recording and converting the spoken word into text, the researcher gains a deeper understanding of what is said, additionally adds their influence and voice to the account as the co-creator, as they inevitably become selective through determination of what should or should not be shared within the narrative; adding emphasis to certain statements determined in part from the theoretical position of the transcriber / researcher and their transcription protocol applied to each of the accounts which is framed upon the

research objectives. This process also provided opportunity to listen with empathy, a key component of the theoretical framework adopted (Sundin and Fahy, 2008).

5.4.10 Transcription

Transcription is defined as “the process of reproducing spoken words...into written text” (Halcomb and Davidson, 2006), a tedious and time rich activity (*ibid*,2006) for which there is no singular, or standardised method (McLellan *et al.*, 2003). The method adopted will depend upon whether the transcription is viewed as part of the analytical process, as in the current study, or an addendum (Tessier, 2012). Automated systems, whilst they do now exist, despite ongoing advancements may produce inaccurate texts incorporating errors or omissions thus require checking; it is therefore recommended a combined approach be adopted, incorporating both automated and manual methods (Tessier, 2012). In the current study this was not readily available, therefore transcription was completed manually by the researcher. The researcher employed a naturalistic approach incorporating everything said (Oliver *et al.*, 2005), this included establishing where punctuation was required to ensure the meaning of what was said was not altered or omitted (McLellan *et al.*, 2003), the alternative approach denaturalisation, indicates the text has been edited to remove “idiosyncratic elements of speech” (Oliver *et al.*, 2005).

Advantages of being the one to transcribe the interview is a deeper familiarity with the subject, a greater understanding of the nuances of the interview and maintenance of confidentiality (Halcomb and Davidson, 2006); however, Halcomb and Davidson, (2006) posit if the purpose of the analysis is interpretive, verbatim transcription may not be necessary, as notes taken during the interview and subsequently during the repeated listening of a recording may suffice, but naturalistic transcription is usually adopted to facilitate an audit trail and decrease the possibility of reporting bias, as direct quotes can be presented within the findings. Furthermore, a naturalistic transcript permits honest recollection rather than imagined content, serving as a form of checking of accuracy; however, it is suggested naturalistic transcription may result in a researcher becoming detached from the emotional aspects that can be captured in interview notes or generated through repeated listening of a recording, which may be a benefit or disadvantage depending upon the context of the research (Tessier, 2012). In the current study it was important for the researcher to focus upon what was shared, rather than be influenced by the emotional circumstances of the participants. Given the focus of the research was psychological aspects, the analysis process required repeated listening of the recordings in combination with immersion in the data generated through transcription and field notes. This approach, the researcher felt, resulted in an appropriate and manageable level of engagement.

Naturalisation is also a factor to consider when determining the nature of the research output. Oliver and colleagues, (2005) caution the researcher to consider the relationship between the extent of naturalisation and ensuring confidentiality. In this research this has been attended to by only presenting excerpts, carefully selected having considered the relevance of each quote shared, achieved through the employment of reflective questioning, to ensure each quote included in the findings was necessary and inclusion justified.

5.4.11 Theoretical frameworks for narrative analysis

Following transcription, and amendments where required, the transcription was subject to the interpretative stage of the narrative analysis. There are many theoretical approaches to this stage, however, as Denzin and Lincoln, (2018) highlight there is no certainty, it is a naturalistic, nonlinear, multi layered and relatively ambiguous process (Wang and Geale, 2015), or as Kim, (2020) suggests more like wading through mud or a “swamp”. The selection of method or aspects of method should be based upon the ontological and epistemological positioning of the researcher. All are predicated upon the principle of reflexivity, fundamental within the process of analysis (Elliott, 2005). Theoretical frameworks provide the researcher with a “kit bag” of analysis and interpretation tools, used to perform certain functions the “job” requires; however, in a similar way to a tool bag containing a range of tools which maybe be used to achieve the same end point (Bold, 2012), frameworks can be employed in different ways to achieve a similar outcome, even a “pick and mix” approach may lead to a comprehensive and in-depth analysis (Nasheeda *et al.*, 2019). Although as Bleakley, (2005) posits, frameworks, whilst they may offer some structure to an otherwise confusing and complex account, may also constrain engagement with emotional aspects of the account, suggesting this is only achievable through “direct immersion [which] enables one to listen more empathetically”.

There have been many narrative frameworks developed during each of the philosophical movements, some of the more familiar post-modernist theoretical approaches considered during development of the methodology and rejected due to focus upon linguistics rather than content and person centeredness, included Lieblich and colleagues, (1998) categorical analysis, concerning choice of linguistics and form of narrative. Riessman’s, (1993) approach which regards the interviewee as an actor and suggests methods to systematically scrutinise events and reactions to them, through analysis of the way that they are articulated by the storyteller; also focussing upon the linguistics of the narrative. Labov, (2013) and Labov and Waletzky’s (1991, 1997) method, another linguistic approach utilising a coding system to categorise the textual version of the narrative, unfortunately at

the detriment of the holistic perspective (Andrews *et al.*, 2013), and Cortazzi's (1993) technique, similarly originating from educational research, where linguistics are considered and the specific structure with plot and coda are emphasised, coda being the final concluding aspect of the story or episode (Riessman, (1993).

Whilst the method of analysis may in part be determined by the nature of the responses attained during an "interview", and the reflective perspective gained from listening to the recording and reading of the transcript (Earthy and Cronin, 2016), the "framing" of the interview question (Denzin, 2001a) will also direct the researcher to favour specific methods. The question posed in this inquiry, following acknowledgement of the strength of relationship obtained from the phase I data, was "could you please tell me more about how things have been and how having (*name of dog*) has helped you during your cancer pathway / experience".

Review of publications not available at time of submission of interview structure (see Appendix 18), a component of documentation required for ethical approval, indicates similar questions have been successfully employed to elicit information surrounding benefits of pets or companion animals in relation to cancer (Ingram and Cohen-Filipic, 2018; Nitkin and Buchanan, 2020; Kogan *et al.*, 2023), this lends validation to suitability of the phrasing of this question, which subsequently proved to be effective in the current research, eliciting a comprehensive response each time, without need for much additional questioning from the researcher.

5.4.12 Interpretation of narratives

The composite or pick and mix approach adopted in the current study is recommended for use in situations where a single approach is not desirable due to the potential of missed elements (Nasheeda *et al.*, 2019). This technique incorporated aspects of Denzin's, (2001a) interpretive interactionism, and Lieblich and colleagues, (1998) holistic and categorical perspectives. These two processes were selected out of a myriad of tools to aid the analysis and interpretive stages due to the question being framed around relationships (interactions) and emotions. Denzin, (2001a) posits narratives are framed upon what the storyteller wants to share, examining the causal relationships and reasons for content selection, identifying key factors (Sundin and Fahy, 2008) or "essential elements" (Denzin, 2001a), and verbal cues, whilst considering the formulation of the narrative as a partnership, whereas Lieblich and colleagues, (1998) holistic approach considers themes, focal and turning points, contraindications, and emotions, contemplating depth of information about an identified "foci", and "unspoken" as much as "spoken" content. Transitions between the themes and the emotional state

of the interviewee (participant) are examined (Earthy and Cronin, 2016), with Lieblich and colleagues, (1998) emphasising importance of empathy and compassion when critiquing the narrative.

Combining the two methods Denzin's Critical Interpretive interactionalism (Denzin, 2001a) and Lieblich and colleagues, (1998) Holistic Content Analysis in addition to a stage proposed by Sundin and Fahy, (2008) a modified approach was established, incorporating the following aspects, which whilst all included, were not worked through in a systematic way, rather the rhizomatic approach was assumed whereby the narrativist "wanders" within the narrative to develop a greater understanding of their complexity and interconnectedness, recognising their ambiguity and multifaceted aspects (Kim, 2020). Additionally, in agreement with Clandinin, (2006), bracketing was omitted as narrative researchers are an integral component of the findings and therefore cannot be excluded.

1. Framing the research question – perceived benefits of human dog relationship (Denzin, 2001a)
2. Deconstruction and critical analysis of prior conceptions – examination of previous theories of phenomena completed within the literature review (Denzin, 2001a)
3. Capturing the phenomena in the social world – acquisition of the accounts (Denzin, 2001a)
4. Listen to (recording) with empathy (additional step)
5. Recording transcription with addition of field notes – paralanguage, silences, gaps, humour, upset (Denzin, 2001a)
6. Checked for accuracy – re-listen and check transcription (Denzin, 2001a)
7. Read with empathy – read account (Lieblich *et al.*, 1998)
8. Written global impression – overall (to focus mind) (Lieblich *et al.*, 1998)
9. Special foci – benefits / relationship (Lieblich *et al.*, 1998)
10. Themes / transitions / salience of what is said (Lieblich *et al.*, 1998)
11. Initiate discussion (original draw conclusions) – in-depth analysis of emerging aspects (Lieblich *et al.*, 1998)
12. Contextualisation – consider the emerging aspects in context with contemporary world (Denzin, 2001a)
13. Change – make recommendations (Sudin & Fahy, 2008)
14. Additionally, in developing the individual stories of each participant the following aspects were considered; analysis of form, cohesiveness of story (Lieblich *et al.*, 1998)

5.4.13 Restorying

Restorying is the process of "synthesising" and reconstruction of the narrative and development of the story, a version of the original account that speaks to the target audience and "retain[s] the emotional and motivational meaning connected with it" (Polkinghorne, 1995); hence it needs to be

in a format which will appeal to that audience, provides an answer to the research question but in a way that conveys the significance of the message to the wider population, and provides an answer to the “why do you need to know this?” question, the inherent social impact message associated with the pragmatic paradigm adopted needs to breakthrough (Kim, 2020).

Therefore, when writing there needs to be a fine balance between the voice of the participant and the researcher, with a focus on the use of plain English rather than academic and scientific language to ensure appeal to a wide audience (Bold, 2012). This needs to be achieved through honesty and genuineness in the reporting of the story rather than a search for the “story”, over smoothing, a specific risk which may result in loss of authenticity of the story (Kim, 2020). smoothing being omission of aspects of the story “not pertinent to its development” (Polkinghorne, 1995). In the generation of the stories within this thesis, smoothing included removing unnecessary content which was associated with discussion of breast cancer out of context with dog interaction, for example discussion of details of breast cancer surgery, and discussion of dog interaction external to the context of cancer, for example dog to dog interaction in recreational areas.

Polkinghorne, (1995, pg. 16-18) offers a seven-point guide for inclusion in a written story (based on Dollard, 1935)

Cultural context; nature of the protagonist; significance of others; choice and actions of the protagonist; historical continuity; plausible and understandable

The resulting narrative or story may take many forms including a written vignette, a written or spoken dialogue of two or more voices (Nardi, 2016), a discussion interspersed with quotations, a play script written or performed. The construction of the narrative may be based upon one or more of the common literature genres, life story, biography, memoir, poem, or be more evolutionary in its design and not fit a specific criterion, the author’s creativity being espoused throughout its development. It should have a “beginning, middle and end” (Polkinghorne, 1995). The end or coda being especially important, as it brings the reader back to the present and provides an opening for an ongoing dialogue about the issue (Kim, 2020). In doing this the author / researcher should also be aware of ethical considerations in initiating this debate and impact this may have on all involved in the research. It may therefore be said that, far from providing clarity or offering a “dry marshland” as intimated in Kim, (2020), in restorying the opposite happens resulting in an increased muddying of the water, leading to greater possibilities for interpretation and further analysis (Clandinin, 2007). Therefore, in accordance with the social constructivist paradigm and the association of narrative inquiry with social justice there needs to be a clear and explicit purpose of the research such that it leads to potential

benefits for the participants and others in similar situations (Pino Gavidia and Adu, 2022). Hence the change stage of the analysis process is fundamental to the success of the study.

5.4.14 Ethical considerations of narrative inquiry

It is suggested narrative inquiry has its own set of ethical standards, which are focused on the interviewer-participant association, hence are known as relational ethics, incorporating safety and trust, and honour and respect in the relationship, plus connection between the research and the researched, or participant (Kim, 2020). Additionally, Smythe and Murray, (2010) suggest narrative inquiry differs from social scientific research, whereby, further to the pragmatic epistemology posited in chapter 3, narrative research has its own distinctive, contemporary transtheoretical approach, holistically integrating ethics and epistemology.

Therefore, aside from ethical considerations of any research situated in protecting confidentiality, promoting beneficence and non-maleficence (Beauchamp and Childress, 2001), it is the responsibility of the researcher to detect any vulnerability of participants and act, accordingly, being mindful to the evolving ethics associated with research of this nature (Bold, 2012). Smythe and Murray, (2010) assert narrative inquiry may result in more ethical dilemmas than other forms of qualitative research, suggesting the most challenging phase of narrative research is not data collection rather the analysis and interpretive stages, whereby the researcher becomes torn between protecting the participant and the uniqueness of their account or story, and the authoritative nature of the interpretation. Ethics requires the researcher to be circumspect of “negotiation, respect, mutuality and openness to multiple voices” (Clandinin, 2006). This becomes especially problematic if the narrative story is published and the paper becomes a pivotal study in relation to the study matter, even if the participant feels narrative interpretation does justice to their story, their personality being on public display may make them feel vulnerable and their wellbeing may be eroded, particularly if they feel that anonymity may be compromised by going public. (Smythe and Murray, 2010).

Whilst it is felt publication of this research is unlikely to lead to participant identification due to participants living in geographically diverse locations and being recruited through many different channels, safeguards have been incorporated into the research methodology of interpretive stages and reporting of the study to ensure anonymity of participants, including an opportunity for participants to review their story thus recognising the multiplicity of the narrative and promoting ownership of the narrative.

5.5 Conclusion

Within this chapter the methodological approach employed in phase II has been thoroughly explored, critically analysed, and justified. This included a discussion of the advantages and disadvantages of the case study approach, the function and execution of the in-depth narrative analysis, including an evaluation of the benefits and drawbacks of utilising a recognised narrative analytical framework, and a discussion of the stages traversed in the generation of the participant stories and hence overall findings. The chapter to follow incorporates a presentation of the case stories, along with their respective narratives and analyses.

6 The Stories, Narratives and Analyses - findings of phase II

6.1 Introduction

Phase II encompassed a case study incorporating four cases. Whilst this may be considered a small cohort (Beach, 2022) it is commensurate with other psycho-oncological case studies (Thomas et al. (2009), Hall et al. (2013), MacArtney, (2016), Treiber et al. (2016), and Beach,(2022) which typically consist of a low number of cases permitting detailed analysis and synthesis with evidence from an extensive collection of publications (Yin, 2018, pg. 199).

The four women featured in the cases, Andrea, Barbara, Claire and Diane were all aged between forty and fifty years old, both Claire and Barbara were married / co-habiting whilst Andrea and Diane indicated they were at that point, single and lived alone. All the women had been living with cancer for several years, with three of the four women (Andrea, Barbara and Claire) experiencing disease progression since the time of their diagnoses, Claire was also dealing with metastatic disease and receiving palliative care. The women were guardians to a variety of age and breed of dog/s and all at the time of our discussion had formed a well-established and strong bond.

Within this chapter each of the women's stories are presented, the stories being the component of the research output developed to readily disseminate through appropriate professional channels either in their entirety or part, to raise awareness of the significance of the dog guardian relationship for women living with breast cancer; there is also an in-depth exploration of the psychological aspects inherent within the relationship of each dyad. Additionally, key themes emerging from the analysis are evaluated.

6.2 Andrea's story

Incorporating Andrea and her dogs Tallulah (Portuguese Podengo), Missy (Toy Poodle), Frank (rescued Poodle), and previous dogs Brandy and Whiskey (Dachshunds).

Andrea was the first participant in the research. Due to Covid preventing in-person data collection, Andrea's narrative was constructed from a combination of her own written narrative produced in response to the request to "please tell me more about how things have been, and how having your dog has helped you throughout your cancer experience", and a follow up recorded conversation.

Andrea was diagnosed with breast cancer in 2013 at the age of 43, having discovered a lump in her breast, initially choosing to ignore the lump hoping it would disappear on its own; unfortunately, the

lump persisted, prompting Andrea to consult her general practitioner who instigated a referral leading to a diagnosis of Ductal Carcinoma in Situ and a mastectomy, but this was not until a few weeks later after Andrea had achieved a long-held ambition to compete at Crufts, the UK's most prestigious dog show, with her youngest dog at the time, Tallulah.

Andrea vividly remembers during the competition thinking "I've got to do something about this, I better go and see the doctor". Shocked by the diagnosis, and still coming to terms with it herself, Andrea found it tremendously challenging to share news of the diagnosis with those around her, more so, because she felt she had to offer comfort to those with whom she was sharing the bad news, rather than them consoling her. However, her dogs at the time, Brandy, Whiskey, and Tallulah required no explanation. They offered unconditional love and were there for her; Brandy and Whiskey, the dachshunds, seemed content to be cuddled and cried on, as Andrea found solace burying her face in their fur.

Brandy and Whiskey had been her companions since they were puppies. They were both fourteen years old at the time of the diagnosis and held a special place in Andrea's heart as they had been the first dogs she had owned as an adult. Dogs had played a prominent role in Andrea's life, she fondly remembered how important they had been during her formative years, and this love for dogs had continued into adulthood. Consequently, after thorough research around breed suitability siblings Brandy and Whiskey had joined the household in 2000. The daxies as they were affectionately known had warm fur and liked to snuggle close. One of them, prior to Andrea's cancer diagnosis, even had the habit of resting her head gently on Andrea's breast, finding comfort in the closeness and enjoying the warmth of their cuddles. Tallulah, a Portuguese Pondengo, a relatively uncommon breed in the UK at the time, adhered to her breed type, which was more primitive in nature: she tended to be more distant and less inclined to offer physical contact. However, Tallulah was still very much an important and a cherished member of Andrea's family.

Re-evaluating life post diagnosis Andrea identified animals and specifically her dogs as needing to be the principal component of her life, more important to her than deluxe vacations, carnal possessions, or a successful career, and having spent some time considering her own mortality and in a defiant vote of confidence in her own future, a puppy, Missy, a toy poodle, soon joined the family. Andrea would take Missy to agility training and competitions. She had also tried agility with Tallulah who it appeared had loved it but, on some days, would charge around the agility course, attempting the jumps in whatever order she chose; Missy on the other hand was a little more disciplined and would attempt the jumps in the correct order, proving to be more accomplished at agility. The family was complete, for now...

Then, in 2014 during a routine follow up appointment, Andrea's consultant noticed a slight anomaly in her mastectomy scar, a biopsy was undertaken the same day, and following several very worrying weeks and various tests to rule out metastatic disease Andrea's breast cancer diagnosis was revised; it was now to be considered a stage 1 cancer requiring further treatment with chemotherapy and radiotherapy. Andrea remembers this to be a very worrying period and recalls there were some very dark moments during which she found great solace by being in the company of her dogs Brandy, Whiskey, Tallulah, and Missy, although she did spend some time contemplating what would happen to them should the worst happen.

Andrea first underwent chemotherapy during which time she was signed off work. Andrea recalls there were days when she felt wretched which coincided with the delivery of the regime of chemotherapy and lasted from a few days to a week. Although there were times when she felt slightly better, the overall treatment period was highly challenging. One memorable moment was during an agility group she continued to attend whilst undergoing treatment. Despite feeling terrible, Andrea persevered, running around a muddy agility course while silently wondering about others' perceptions, thinking "gosh what must people think of me" since she hadn't disclosed her diagnosis to anyone in the group.

Offering non-judgmental support during times when she felt confused and had brain fog due to the chemotherapy, Andrea considered the dogs as being instrumental in keeping her grounded. In addition to participating in the agility Andrea also joined a walk and talk support group specifically for women with breast cancer, this group organised short wellbeing walks which Andrea would attend with Missy. Whilst Andrea commented that she found these encounters a little intimidating, she felt more at ease having Missy by her side, as it deflected the focus of conversation onto Missy, which made Andrea feel more comfortable, thus Missy became a kind of emotional shield and at times even a physical shield, as Andrea recounted that on occasions she would hide behind her, lifting her up to cover her face, noting that hiding behind the dog was something she would do in her childhood when being reprimanded. Despite this challenging period, Missy remained steadfast; her bouncy, joyful, happy self, aiding Andrea's recovery and supporting her wellbeing.

In 2015, Andrea welcomed Frank into her family, a Poodle from a nearby rehoming centre. Frank was somewhat anxious, so it was essential to find an experienced owner capable of assisting him in overcoming his challenges. Andrea firmly believed that she possessed the unique ability to rescue Frank and therefore offered him a warm and loving home. Andrea and Frank would go on long walks together; being a standard Poodle, Frank possessed slightly higher stamina compared to Missy, a toy

Poodle with shorter legs. Nevertheless, Missy remained cherished and an integral member of the household, along with Tallulah and Brandy and Whiskey who were now quite elderly.

At the time of the interview, which coincided with the end of the lockdown period, Andrea had recently completed a walking marathon with Frank, raising funds for a national cancer charity. She cited the physical and psychological benefits of walking for both herself and Frank, explaining she had adopted walking as a form of exercise in an effort to come out of her cancer experience fitter and stronger. Andrea felt that Frank, along with her other dogs, had played a significant role in her personal healing journey; in their unique and individual ways, all her dogs had provided invaluable unconditional support. Frank, specifically, had assisted in her recovery, while she, in turn, had helped him develop his confidence and reduce his reactivity, Andrea also felt that she was reciprocating the support she had received by now extending her assistance to individuals who had recently received a cancer diagnosis, who were new to the walk and talk group. She vividly remembered the emotions she had experienced when first confronted with her own diagnosis, and had a strong desire to help and comfort others.

Hinting at the difficulties she still encountered Andrea shared that she had anxieties about the possibility of cancer recurrence, acknowledging these concerns were likely to persist indefinitely. These anxieties were particularly intensified during the period leading up to follow-up appointments or whilst awaiting the results of mammograms or other tests; she said she got the impression her friends believed this episode of her life was over, whereas she personally felt that it would never truly reach closure, indicating she didn't want to concern friends or family with any ongoing challenges for fear of perpetuating their worries. Hence, she would be selective about what she shared with loved ones; her dogs, however, provided a safe space for her to confide her fears in whispers, and they were always ready to receive cuddles and gentle strokes.

Summing up her cancer experience to date, Andrea drew a parallel between the then recent Covid lockdown and her initial adjustment to the cancer diagnosis, indicating both situations had brought about a sudden contraction of the world around her. The lockdown period had been a source of significant stress for Andrea, however, unlike cancer it had affected everyone. Nevertheless, Andrea had found solace in the presence of her dogs throughout this challenging time, and continued to do so; they had offered consistent unwavering love and support, remaining by her side during the darkest moments, they were all emerging stronger, re-energised and with a new sense of purpose.

6.3 Analysis of Andrea's story

Through analysis of the written narrative and subsequent telephone conversations, it became clear dogs had consistently played a vital role in Andrea's life. This significance seemed to intensify, particularly after her breast cancer diagnosis, prompting a re-evaluation of life, ultimately leading her to conclude dog-guardianship served as a meaningful gauge, for measuring a fulfilling existence.

I remember it sounds really stupid...I remember at some point, when you start thinking about death and your life expectancy, and these are the things you haven't really thought about before, and I just thought...it sounds a bit stupid really...but I just had this terrible thought I'm never going to have all the dogs that I wanted to have and that was the thing I was kind of missing...I won't live long enough to have you know the next lot of dogs...you know, so one of many thoughts that you have, but I did kind of feel that. I mean I always feel that anyway, that we don't live long enough to have enough dogs...it really hit me that I might be missing or that these might be the last ones even...you measure your life out a little bit in the dogs that you have...

Re-evaluation is a well-recognised reaction to a diagnosis of a potentially life limiting condition (Post *et al.*, 2020) often accompanied by the development of a list of activities or experiences that the individual wishes to engage in before a specific event occurs. This may involve a "bucket list," which is a compilation of experiences, goals, or aspirations an individual aims to fulfil or undertake within a given timeframe (Zascerinska *et al.*, 2022). The concept of a bucket list serves as a reminder to seize opportunities and make the most of life's precious moments before they become limited (Chu *et al.*, 2018).

In Andrea's case, re-evaluation centred around a thorough reassessment or reappraisal (Folkman, 2008) and reclassification of various aspects of life, prioritising what mattered most, ultimately leading to the realisation dogs held greater importance than material possessions, vacations, and career fulfilment.

...it's natural to reflect on your life and consider what you regret and what is most important to you. Although I was genuinely optimistic about my long-term health prospects – and my breast care nurse was at pains to point out I did not have a terminal illness – I did think long and hard about the life I wanted if I was lucky enough to get through this. Again and again, it came back to dogs. The thing I valued more than almost anything else was not career, fancy holidays, or material objects – it was animals, nature and especially dogs.

That's why very soon after recovering from my surgery, I got a puppy – a toy poodle called Missy. Missy was a defiant vote of confidence in my own future.

Andrea found that Missy, along with her other dogs, provided invaluable support in many contexts. One area she found particularly challenging was when discussing her diagnosis and feelings about cancer with those around her. This was primarily due to friends' and family's limited understanding of the situation, differing perspectives, and their own concerns and worries. Andrea found she could openly share her thoughts and feelings with her dogs without the fear of upsetting them or having to navigate their emotional responses. The dogs offered a non-judgmental, unconditional, attentive presence, as illustrated by this quote.

One of the most daunting prospects was telling other people – family, friends, work colleagues and people I didn't know very well but would need to know – my hairdresser, for instance. Each disclosure was massively difficult, and I found it hard not to cry every time. Most people reacted really well, but in some cases I felt I was having to comfort the other person rather than the other way around. With the dogs, of course, it was different. They never needed an explanation and couldn't understand what was happening. They were just there, constant, reliable, and also open to uncomplicated affection.

Dogs have been cited as being excellent conduits for the maintenance of routine and daily tasks, requiring regular care and attention (Holland *et al.*, 2022). Andrea posited that even at the darkest of times the presence of her dogs provided her with a sense of stability and motivation to continue her activities of daily living (Roper *et al.*, 2001), they still required feeding, toileting, and exercise; despite feeling unwell due to the chemotherapy she was receiving at the time, Andrea would take the dogs out on her own when able.

When you are off work having the chemo there's literally nothing else you have to do, so the one thing that you can get yourself to do is to go for a little walk, you know, so I did...

On the plus side, even on the darkest days, the dogs provided structure and constancy. They had to be let out for a wee in the morning and fed and walked.

During moments when Andrea didn't feel physically capable, she would rely on the support of her friends who willingly accompanied her and the dogs on short walks.

I went out, pretty much every single day I went out for a short walk because of the dogs, I just had people come with me, but you're not that ill, I know everyone says it's awful but it's not that incapacitating.

Identifying walking as an enjoyable activity that aided her recovery, Andrea joined a local walking group for women experiencing breast cancer. Although the group was not specifically intended for dog owners, Andrea was warmly welcomed into the group. Coincidentally one of the group volunteers also brought their dog, giving her and Andrea something in common.

The fact that I could take Missy with me really helped, as it didn't feel quite like I was going on my own and a dog is always a talking point. you know it's a way of communicating without...so going to a support group can be a bit intimidating obviously they don't mean it to be, and it isn't really... but you're a bit nervous and um, but it was just nice to have a dog to kind of break the ice a bit...and everybody loved her of course...

Attending the group with Missy initially, subsequently then with Frank, Andrea found having a dog (Missy) with her helped build her confidence, as Missy acted as a social conduit or catalyst, a focal point for initiating conversations.

A dog also provides a sort of protective barrier – so the first conversation is “so, what’s the dog’s name?”; “Isn’t she cute!”, not “so you have cancer...” I felt that Missy was almost like a kind of shield and would give me a moment’s breathing space while I gathered my thoughts and built-up confidence to talk to people about my experience and feelings.

As discussed on page 54, dogs simply being present in a social situation may serve as social conduits (McNicholas and Collis, 2000). This role, generally not a conscious act, does not demand specific input from the dog; however, the effectiveness of the role may be enhanced when the dog is capable of handling social interactions and comfortably engage with other dogs. Andrea however, found it particularly challenging meeting new people, especially in situations such as the support group where the expectation was discussion would centre around her or her experiences related to breast cancer. Her way of dealing with the situation was to hide behind her dog, Missy, who served as her trusted "security blanket," providing comfort and a sense of protection. Using Missy as a security blanket may be viewed as a form of regression. Initially identified by Freud, regression was thought to be a maladaptive coping mechanism (Mercer, 2011), wherein individuals exhibit more childlike behaviours, especially self-soothing behaviours which have previously proven effective in reducing the stress of similar situations (Ayers and Prytys, 2002). However, more recent perspectives acknowledge regression is not necessarily maladaptive but rather a beneficial transitional coping style (Mercer, 2011). Andrea explained her reasoning for picking up Missy...

Sometimes, I would pick her up and literally use her as a shield, holding her in front of my face as I spoke about difficult things (I think I used to hide behind the dog when I had difficult conversations with my mother as a teenager).

You know where little kids have a blanket that they suck on and whatever and they take it everywhere with them it was like that, like she was some sort of defence, I don't know how that functions in your brain psychologically but um yeah...I know it's like that yeah

Regression may provide short-term relief in stressful circumstances; however, long-term it can have detrimental effects on the individual, employing it temporarily while simultaneously developing more

adaptive strategies may be helpful (Cramer and College, 2015). Andrea was subsequently able to develop an alternative coping strategy for such situations. As a result, she was able to attend walks without relying on a “dog shield” and even started offering support to others, newly diagnosed, in the support group. Missy, being available when she needed her the most, proved to be invaluable, allowing her to engage in regressive coping which in turn facilitated the development of a more effective, adaptive coping style.

I've made friends through the cancer support group, we've done a lot of training, walking together, and Frank is kind of like our mascot so it kind of goes round and round, but it's more positive now and less desperate and needy than it was when I'm clinging onto Missy and crying on her, those kind of days are over, there is a kind of process, there is a kind of...yeah...so we are all healing.

Andrea observed that when she hid behind Missy, she would also bury her face in her fur. This tactile and haptic interaction could be perceived as a method of grounding (Fine, 2019), helping her reconnect with the world around and stimulating the release of oxytocin to produce a calming effect (Morrison, 2016). Operating in tandem with the act of picking up Missy, the tactile stimulation potentially served as a conduit to regression, evoking feelings reminiscent of a sense of security during the difficult stages of childhood. This approach proved effective in the short term, Andrea did not observe any negative effects in Missy, who appeared to enjoy the close contact and who may also have benefited from the synergistic release of canine oxytocin, and consequential calming effect.

Andrea cited several occasions where she derived comfort from touching Missy's fur and crying on her, it is possible the act of breathing through distress, which involves “convulsive inhaling and exhaling of air” (Patel cited in Vingerhoets et al., 2000) combined with the proximity to Missy may have facilitated the inhalation of Missy's scent to be more efficient, consequently elevating the production of oxytocin in the hypothalamus and subsequent release from the pituitary gland (Powell et al., 2019). Oxytocin is known to increase via conditioned feedback, in response to familiar scents stimulating olfactory memory (Marazziti et al., 2019), thereby amplifying the calming potential for Andrea of the interaction (Handlin et al., 2012). At the same time Missy would have been exposed, due to proximity, to the familiar scent of Andrea; as a result, Missy would potentially also undergo an oxytocin release and dopamine surge (Berns et al., 2015) both of which are highly effective in calming dogs (Petersson et al., 2017). This may have been even more pronounced in Missy compared to Andrea, as dogs possess a significantly larger number of scent receptors, a greater processing ability and well-developed nasal pathways (Kokocińska-Kusiak et al., 2021) enabling them to detect and respond more strongly to olfactory stimuli, and whilst the amplified scent is not yet scientifically

proven to increase oxytocin production, it is known dogs can detect emotions when exposed to sweat samples (Siniscalchi *et al.*, 2016).

Andrea disclosed...

"I used to cry on her...yes she licked my tears, probably nice and salty...again you don't have to over interpret, I mean tears are full of salt, you think they are being loving and supportive but I don't know that they are, it certainly felt at the time likewise...it doesn't really matter whether it's true or not does it if that's how you kind of experience it".

Here Andrea raises a very valid point regarding perception, as corroborated by (Herzog, 2011), whether dogs have a positive or potentially less favourable impact on mental health relies entirely on the individual and the specific dog/s involved; if the individual perceives the relationship to be beneficial and ensures the dogs' welfare then, placebo effect or not, both parties benefit. Certainly, Andrea appeared to have a warm and loving relationship with all her dogs, based on mutual respect and understanding.

6.4 Barbara's story

Barbara's story incorporating Barbara, her partner Tina, and their dog Lucy (rescued Staffordshire Bull Terrier Cross), previous dog Chloe.

Barbara was the second participant in the research, her initial response was through the production and submission of her own series of videos recorded mid pandemic, and subsequent recorded follow up telephone call, transcripts of both the telephone conversation and videos were merged to form the overall narrative.

Barbara had been diagnosed with breast cancer following a positive routine mammogram; this had led to a series of rather extensive surgeries due to infection post initial lumpectomy. Just prior to this diagnosis Barbara and her partner's elderly dog, Chloe had died, or as it is often termed had "passed over the rainbow bridge", leaving Barbara and Tina feeling a little bereft and sad.

On the passing of Chloe they had agreed that it was too soon to acquire another dog, they needed time to grieve for Chloe; however, only a few days later they had found themselves at the local dog rehoming centre "just looking", resulting in them, following a visit with Barbara's mother-in-law, reserving a new dog, Lucy, an eighteen month old Staffie-cross, who was to join them a couple of weeks later. As it transpired Lucy contracted kennel cough, so this period of waiting for her arrival

was extended, during which time Barbara received the call back letter from her initial mammogram. Anticipating there had been a quality issue with the imaging, Barbara was shocked when she received the diagnosis of breast cancer and reported that although accommodating a new dog at this time had not been ideal, or part of the plan, and intended activities such as a puppy training class were not realised, Lucy had been a very welcome distraction from the challenge of coping with the situation.

On reflection Barbara said she felt Lucy had been adopted at “just the right time” and how she would have struggled to cope psychologically without Lucy providing much needed company and companionship. Particularly as Barbara’s anticipated simple lumpectomy with reconstruction, evolved into a complex operation requiring a vertical skin flap and skin adhesive to the wound under the breast, which became infected, meaning Barbara required further surgery. This had caused further disruption to Lucy’s settling in period; however, having Lucy had provided much appreciated companionship for Tina whilst Barbara was hospitalised.

Barbara shared her belief fate had brought Lucy to her and Tina, Chloe had prophesied what would happen and had sent Lucy to them that day at the rescue centre. Subsequently Lucy had become a much-loved part of the family, facilitated by her adoption of a space in the marital bed and allocation of a favourite chair: as with her predecessor Chloe, many of the family activities now revolved around her requirements.

Barbara reflected upon the disruption and confusion that Lucy must have experienced within what would have been a short period of time, firstly being a stray, then being housed in a rescue centre for a few weeks, isolated in the centre due to kennel cough, then brought to a new home where after two weeks of routine three times a day walks, the routines they all craved were no longer possible. Walking Lucy became a challenge, not only due to the disruption associated with the cancer diagnosis and associated hospital visits, but because Lucy was a boisterous dog who would pull on her lead in her enthusiasm to get to the local park or reach an enticing cat or bird nearby. Barbara having had extensive axillary surgery experienced some weakness in her arm and was conscious of causing injury which would have increased her recovery time, so had been hesitant in exercising Lucy on her own. Lucy had therefore not been taken out as often in the early days of her rehoming as Barbara would have wanted. However, this had provided additional time for Barbara and Lucy to bond through calming and indoor enrichment activities, Lucy’s favourite being to dismember her soft toys which Barbara and Tina lovingly re-stuffed and repaired before returning to Lucy for her to repeat her disembodiment.

In the afternoons, during her recovery Barbara would lie on the sofa, and despite having only been with the family for a brief period, Lucy would snuggle in close whilst they both relaxed and enjoyed each other's company; this continued until Barbara started her radiotherapy treatment, the last part of her initial treatment, or so she thought. The original plan had been for Barbara to commence her radiation treatment a few weeks after the surgery allowing time for some healing; however, when attending for her radiotherapy planning appointment it was discovered she had a severe infection in her breast resulting in tissue necrosis, necessitating three more operations and multiple nights in hospital, during which Lucy again provided much appreciated company for Tina, who found Lucy had taken advantage of the additional space in the marital bed and made herself quite comfortable.

It was at this time that Barbara reached the lowest point of her cancer journey, spending more time in bed than she ever had before, but even in these darkest moments Lucy was there beside her offering comfort and companionship and providing a reason for her to get up and have purpose in her day. There had been a few days when Barbara had felt really wretched, Lucy had sensed these occasions and would happily spend the day lying beside Barbara watching over her until she felt better. Unfortunately, Barbara was still unable to lead walk Lucy independently, this time due to breast soreness, so Barbara, Tina and Lucy would go out together, not the circumstances they had expected when Lucy joined the family, but the family now felt complete, and everything settled.

This was until three years later when Barbara experienced a cancer scare, this time the concern was ovarian cancer, as an ovarian cyst had resulted in high blood markers indicative of ovarian cancer and Barbara had been referred to a gynaecological oncologist setting off alarm bells in her mind, and thoughts of "oh my god is there something they haven't told me". Fortunately, this turned out to be endometriosis and fibroids, which whilst extremely painful were easily remedied via a total hysterectomy followed by a significant recovery period, again aided by the unwavering support of the family, Lucy being an important part of that family.

At the time of our conversation it was five years since Barbara's initial breast cancer diagnosis, and having coped with all the challenges living through a pandemic brought with it, Barbara sounded more content with life, having secured the ability to work flexibly from home when needed, ably assisted by Lucy standing on the laptop during Zoom calls, and providing amusement and focus whenever dark thoughts crept into Barbara's mind. Lucy, Barbara, and Tina's relationship had been cemented through the challenges they had overcome, challenges they continued to face. On speaking with Barbara, it was clear worries around cancer were still present; Barbara expressed concerns about her yearly mammogram being delayed due to the impact of Covid, queries around her ongoing medication and discomfort being experienced as a result of the side effects of the hormone therapy

she was taking as part of a long-term treatment protocol. During times of confusion and worry Barbara told me that she confided in Lucy, telling her how she felt when out walking together, or having a cuddle on the sofa, not wanting to worry others. Barbara said she chatted candidly to Lucy, who she perceived probably thought she was “off her trolley”, but in exchange Lucy lavished “kisses” and was present, instinctively responding to any stress or discomfort Barbara was experiencing, by providing a focus and distraction; equally Barbara’s fondness for Lucy was apparent, demonstrated through her use of human terms referring to herself and Tina as mummies, and to Lucy with words of endearment and unconditional love.

Following several successful off lead trials, Lucy was regularly allowed off her lead, thus reducing the potential of Barbara being injured through pulling. These trials had also demonstrated Lucy was able to interact with other dogs in a friendly manner meaning Tina and Barbara had been able to go out as a family taking Lucy out for long runs in the fresh air, something Barbara identified as beneficial in helping her get her mind off things. Overall, Barbara felt they had all greatly benefited by Lucy becoming part of family and her role, although not intentional, had become essential in supporting the family during times of uncertainty and distress.

Summing up life with Lucy, Barbara said

Dogs are a tie when you want to do things, but that’s our choice, you know we wouldn’t have it any other way, coz that’s our choice and that’s what we wanted, and as long as Lucy’s happy that’s the main thing. Breast cancer comes and gives you a big bite on the arse...but Lucy was in the rescue centre on that day for a reason...her sister sent her to us, because her sister knew what was going to happen...

6.5 Analysis of Barbara’s story

Through analysis of the video footage and within the conversation with Barbara it was apparent Lucy had played a significant role in respect of providing companionship to the family. Companionship, a construct often applied in relation to the human-dog dyad, is defined by (Dotson and Hyatt, 2008) as “accompanying and associating with one’s dog”, consequently the scientific term for a family pet is a companion animal (Howell *et al.*, 2022), a domestic dog, a companion canine, or in Latin *canis lupus familiaris* (Vanacore, 2023).

Loneliness, often thought as being the opposite to companionship, an absence of social interaction (Hawkey, 2022), is an aspect of life which has warranted much investigation in recent years. In the context of cancer, this has led to the development of both a loneliness scale (Adams *et al.*, 2017) and the “cancer-related loneliness assessment tool” (Cunningham *et al.*, 2018)

Cancer is thought to be a catalyst for increased loneliness, due to a desire not to burden others with distress, a perceived need to provide an emotional buffer for others, and an unrealised expectation others will understand when the person with cancer desires to discuss their diagnosis, treatment, side effects and existential thoughts (Adams *et al.*, 2017). Whilst opportunities exist within support groups or more casually within waiting rooms to divulge these philosophical and often complex reflections, thus taking advantage of the available companionship and having a shared experience, the possibility of comparison may also arise, a phenomenon that can impact upon wellbeing and increase the likelihood of loneliness (Kim *et al.*, 2016).

Dogs are cited as potentially helping ameliorate general loneliness and cancer related loneliness through their ability to provide companionship as a result of their emotional stability, predictability and availability (Peacock cite in Ratschen *et al.*, 2020), although it should be acknowledged this is not a universal finding and every human-dog dyad is different in terms of its perceived positive and negative effects (Herzog, 2011); certainly the deep affection and high regard for Lucy was evident, particularly during the more challenging stages of Barbara's cancer journey. Barbara highlighted the crucial role Lucy played in providing companionship and support to both her and Tina, especially during periods of solitude or distress. For instance, Barbara recounted an occasion when she was unexpectedly hospitalised due to a post operative infection in her residual breast tissue, sharing her thoughts about the invaluable presence of Lucy during this difficult time.

I had that second surgery and then in the October I went to get tattooed up ready for my radiotherapy, and low and behold they couldn't, well they tattooed me up but said I had an infection, I had fat necrosis in my left breast and had to have it operated on...three times, so again overnight stays and the final time, was like a four or five hour op and a five day stay again, at least Tina had Lucy to come home to; Lucy likes to sleep on the bed, so it was company for Tina when I was in hospital...

Barbara underscored the significant contribution made by Lucy in supporting Tina during her inpatient stay, whilst also acknowledging potential stress and sense of helplessness Tina may have encountered during this period.

I don't know how things would have worked if we hadn't had Lucy with the cancer treatment and going in and out of hospital you know because coming home, especially for Tina, coming home after leaving me in hospital on various occasions must have been quite difficult, and at least then she got to come home, and had someone, somebody here in the house with her and she wasn't left to think "urgh what's going on in hospital", she had, had another focus which was good

There had also been instances when Tina had been out, meaning Barbara was on her own. One such occasion that remained significant in Barbara's memory was when she attended the preliminary

biopsy appointment prior to being diagnosed with breast cancer. Despite the brief period Lucy had been in their lives, her presence and companionship upon returning home proved to be greatly advantageous for Barbara.

At least coming home on that Wednesday, because I'd had biopsies taken there and then, and then had to drive home, I was so glad I didn't come into an empty house.

Lucy not only provided companionship but also served as a distraction for Barbara and Tina during times when they were grappling with the emotional impact of receiving bad news. Barbara's words below exemplify this sentiment. Distraction may be considered a coping mechanism (Bradford *et al.*, 2022), one of the key families of coping identified by Skinner and colleagues, (2003); although closely aligned with avoidance in some earlier theories (Carver and Scheier, 1989) it is frequently adopted by women with breast cancer during the interval between diagnostic evaluation and surgical intervention (Drageset *et al.*, 2010).

...with Lucy it was so nice on that Wednesday after I'd been to the hospital, to come back and just sit with her, and just take it all in. I mean the minute they stick needles in, and there is a shadow seen on the scan you know it's not going to be good, especially when they do biopsies in two areas.

Likewise on another occasion

So again, on the Friday to come back, it was so nice to come back, and whilst the two of us were just sitting here, we had another focus for our attention.

Barbara's recuperation period was protracted due to post-surgical complications, leading to a prolonged confinement period that exceeded the initially anticipated duration. As a result, Barbara was unable to venture outside during this extended period of recovery therefore greatly appreciated Lucy's companionship.

Having somebody here for company even though I couldn't necessarily go out and walk her because of the surgery but just having her here was company really, and I think it's good for...it was good for me mentally you know I didn't go stir crazy because I had her.

So, I think that was quite a good thing, so yes she was here, she was a companion, she did struggle with me not being able to take her out because prior... I mean we had only had her for a week or so, only a couple of weeks, but I would take her out in the morning, and then Tina would take her out at lunch time, then we'd take her out in the evening, so that routine was away with the fairies, and you know she kind of, kind of struggled with that.

Lucy's presence and support were not solely limited to her proximity to Barbara but were also reflected in her eagerness to establish physical contact with her. Lucy's direct contact represents an additional component to her role as a companion animal (as not all dogs desire to be as close), evidence suggests human interaction with dogs may lead to a decrease in stress levels via a release of oxytocin and a reduction in cortisol (Handlin *et al.*, 2012). In the context of Barbara's experience, Lucy provided physical comfort by choosing close proximity during times when Barbara experienced discomfort or fatigue resulting in a nap or prolonged periods of rest. Barbara posited Lucy had developed a learned association with Barbara's need for physical comfort, as evidenced by Lucy's response to visual cues such as the removal of a slipper or a slight movement of a cushion, which seemed to signal the initiation of a "snuggle session".

Once or twice, I spent the day in bed because I didn't feel great, and then January 2018 when I had, had my twenty sessions of radiotherapy and I worked all through that, and that, you know, she was here again.

It was lovely to have her here. I'd get tired in the afternoons, I'd lie on the sofa, she'd get up on the end of it and try to snuggle up behind me, even now if I flip one slipper off, and just move the cushion on the sofa, she's off her chair or wherever she is and she puts her head on your lap, and gives you those big sad eyes, then she's up on the sofa with me, thinking that I'm going to put my legs up and she can snuggle in.

Lucy was also able to sense when she was needed.

She senses when I feel unwell she comes up, she gets on the bed and then she's right up beside you trying to keep you safe, kind of thing. Yes, she's been really good, she knows when she's needed and when she's not. She doesn't like you spending all day in bed but if you are poorly you have company, she comes up on the bed and she lies curled up on the bottom of it, or she's standing at the side of the bed licking your arm, she likes to be close to you when you are poorly.

Following the period of radiotherapy Barbara encountered restrictions in her daily activities, prompting Lucy to assist as a daytime companion while also accompanying Barbara and Tina on evening walks. Lucy's presence offered a source of support and served as a focal point for both Barbara and Tina, providing mutual comfort and companionship.

So, then everything jogged along quite nicely, it was nice to be at home, but it was nice to have Lucy there, I was limited to what I could do.

My breast was a bit sore and tender, and I couldn't always walk her, so Tina and I walked her together which was nice, just her being at home whenever I have been unwell through the cancer journey it's just nice to have had her here.

In 2019, the onset of the Covid pandemic had a profound impact on the daily lives of everyone in the UK, including Barbara and Tina. Specifically, Barbara's intentions to return to work were abruptly interrupted by the pandemic's outbreak, resulting like many, in remote working.

Lucy's loved it because I've been at home mainly, working during Covid, during lockdown so she's had me at home all the time, she's great, she comes over and gives cuddles, she knows when you're stressed and things.

Although Covid-related restrictions had been lifted at the time of our discussion, the ramifications of the pandemic continued to affect access to routine healthcare; Barbara expressed concern over the delay of her follow up mammogram.

I'm bit frustrated that my annual mammogram has been postponed or cancelled, but you know there are more important, people need to be seen, be treated but it doesn't stop the fear, it doesn't stop the fear going away, that there could be something there, I don't think there is, but then again I didn't think there was before, I didn't have any idea of the initial diagnosis in the first place so who knows, I'm hoping, hoping possibly by Christmas I'll get my third one and just keep going with it, but you know Lucy's here.

The significance of ongoing healthcare was particularly in the forefront of Barbara's mind because following the diagnosis of breast cancer Barbara had subsequently experienced another significant health event, again Lucy had provided companionship and support during what was a difficult time.

I had a scare last year as I wanted a hysterectomy because I always have problems in that department, and I wanted it all taken away, that was a bit of a "hoo ha", it started about this time last year. I was being tested for ovarian cancer as well so that was really scary coz they did the ovarian cancer blood test and my level was raised, ... I had a cyst and that again was another "hoo ha", it wasn't cancer related but we were really glad that you know, that Lucy was here.

She also reflected upon the role of Lucy in providing her with continued support, companionship, and a sense of direction throughout the pandemic period. Furthermore, Barbara conveyed her hope for the future that spending time together with Lucy would enable her to foster a stronger bond and relationship.

Well, she's upstairs at the minute again, but Lucy's here Lucy's with us. I'll have company, Tina starts her new job this week Monday, so I'll have company here. If I get down days worrying about the cancer coming back, with the mammogram being postponed, she'll be here she'll be my focus, and her and I'll get our bond back together again because I'll be taking her out a lot more, which will be nice.

Barbara felt that going out for a walk was not only an opportunity for getting fresh air and exercise but also served as a means to attain a degree of solitude and privacy that allowed her to confide her

worries to Lucy, worries related to aspects of life she typically refrained from disclosing to others for fear of upsetting or burdening them with her concerns.

It's nice to get out and walk her and get your mind off things. I always talk to Lucy, I talk to her when I'm out walking, I talk to her a lot, she looks at me as though I'm bananas, I tell her things I don't tell other people from time to time, again she just looks at me.

The act of self-disclosure to an animal (as discussed on page 56) has been posited as a means of providing comparable health benefits to self-disclosure to a human partner or confidant; however, certain topics, particularly those pertaining to anxiety and fears, are more likely to be reserved for disclosure to a partner or dog than a friend or companion (Evans-Wilday *et al.*, 2018). This finding suggests that dogs may serve as outlets for emotional release when the burden on significant others is perceived to be too high or the discussion too emotionally challenging or draining.

Historically, as a result of social expectations, women have been considered to be more willing to engage in self-disclosure compared to men (Dindia and Allen, 1992). However, a meta-analysis of 205 studies examining sex differences in self-disclosure revealed the differences in the level of self-disclosure between genders were only slightly skewed towards females; overall, the difference was statistically insignificant (Dindia and Allen, 1992). Furthermore, as conventional gender roles change, the tendency for self-disclosure is becoming more comparable between males and females (Baumeister and Vohs, 2007). However, in the context of human-animal dialogue Evans-Wilday and colleagues, (2018) assert women are more inclined to divulge emotional aspects of their life to their dogs than men.

Barbara appreciated others had their own worries, therefore was reticent about burdening them with her problems. Avoidance of disclosure as a result of concerns for others has been demonstrated as a factor which may impact overall distress experienced (Yoshida *et al.*, 2010); consequently, confiding in Lucy about matters pertaining to her health and wellbeing offered an opportunity for her to verbalise her concerns, which has been shown to be beneficial for mental health (Stanton *et al.*, 2006), whilst not unduly worrying others or exacerbating their stress levels. This perspective is informed by the recognition of a dog's ability to be a non-judgmental listener and demonstrate unconditional positive regard to its human companions (Evans-Wilday *et al.*, 2018), a function Lucy appeared to be more than capable of performing.

Sometimes when we have cuddles on the sofa I say to her "I'm not feeling very well today but we are not going to say anything to anybody"(giggles), and "my hand hurts, but we are not going to say anything to anybody" yeah, my hand really...but it is what it is, but you don't want to worry anybody you know, others have got enough of their own woes, I

don't want to add to anyone else's stress, so I keep my gob shut, (laughs). I just keep quiet. Lucy she just deals with it, she just looks at me as though I'm off my trolley.

It was evident Lucy was the right dog, who had arrived at the right time. She was deeply loved and greatly valued, rapidly becoming an integral member of the family. Despite only being acquired at the onset of Barbara's cancer journey, which had been somewhat protracted, it appeared Lucy had quickly acclimatised to her new environment providing indispensable support to both Barbara and Tina throughout and beyond Barbara's cancer experience.

6.6 Claire's story

Claire's story incorporating Claire, her husband Carl, and their dog Hero (cocker spaniel).

Claire attained the lowest physical and emotional wellness FACT-B sub score of all participants, but at the same time also the highest mMDORS score, it was therefore good to have the opportunity to talk with her and find out more about her life and relationship with her cocker spaniel, Hero. During our conversation it soon became clear as to why Claire had scored so poorly on the FACT-B. Claire was very honest and open in her response to the request to please tell me about her condition and relationship with Hero. Throughout the interview Claire led the conversation sharing only what she felt comfortable to disclose, and at times becoming tearful, especially when talking about her mortality and current state of health. It soon became apparent Claire had very advanced disease and because of this we were unfortunately only able to meet once. However, during that one conversation Claire told me about the amazing connection she had with Hero, how attuned he was to her and was able to sense her needs, his ability to diffuse tensions between herself and her husband Carl, which arose from frustration and loss of control, the challenges associated with coping with advanced stage breast cancer, and the emotional support Hero provided to both of them.

Claire had been diagnosed with primary breast cancer in her late twenties; now in her early forties, Claire had been living with secondary disease for the last six years, which had resulted in her needing surgery to stabilise her spine which had collapsed due to spinal metastases. This diagnosis of secondaries had put a stop to Claire and Carl's plans to start a family, and had challenged their future intentions, having at the time recently purchased their first house together, ready to set up their family home. A family which later was envisaged to include a dog as part of the family unit, as well as, it was hoped, babies of the humankind. Unfortunately, Claire was left unable to have children due to the extent of the cancer and treatment side effects. Consequently, once Claire had recovered from the surgery, they decided to get a dog, for companionship. Selecting a spaniel due to their intellect and ability to learn fast, Hero came to them as a puppy, chosen from the litter, as he was the cheeky

chap who licked Claire's nose, he was "the one", and during those early days following his introduction into the household, Carl had devoted considerable time training Hero in basic obedience plus a few tricks, he was the dog they always wanted. The three of them were content and developed an awesome bond, together they became a family unit, although not the original one destined to be.

Hero was not only intelligent but appeared to be instinctively in tune with Claire's emotions, reacting by being present, putting his paws on her shoulders, licking away her tears when she became upset, providing support not only for Claire, but also Carl. Originally sleeping downstairs, more recently Hero had found his place in the marital bed; rather than this being viewed as an inconvenience, Claire said she found this reassuring, but indicated Carl in particular felt comforted by placing his hand on Hero each night when sleeping. Known affectionately as their "therapy dog", Hero had become an integral and essential part of the family, Claire's dependence on him was apparent.

Claire explained she had experienced severe anxiety for some time, for which she was receiving psychological support; this had affected her ability to walk Hero in public areas as she feared losing him through injury or theft, this anxiety had been compounded by Covid and her having to shield throughout the pandemic. Fear of loss also impacted upon her relatives, who prior to Covid had walked Hero on a regular basis, but who now felt the responsibility to keep him safe due to Claire's anxiety about him being away from her. Therefore, Claire and Carl exercised Hero at a nearby private field, a location where Claire felt safe, here they could have fun, throwing a frisbee for Hero which he would expertly catch, allowing him to run free without concerns about his security. There was one other place they did feel comfortable taking Hero, that was to the local pub. At the pub he had become "a bit of a celebrity", was very popular with the staff and other customers, would be given lots of treats, but here he also acted as a facilitator of social engagement, often becoming the focus for the initiation of conversation and company, especially for Carl when he was on his own.

Hero's role as a social conduit was also effective when Claire was attending her chemotherapy sessions. Claire shared that she would chat about him constantly, this helped her feel calm, in an environment which she found distressing. Additionally, Claire felt this helped others communicate with her, as she recognised people found it hard to know what to say and would often start a conversation by asking after Hero or calling by with a new dog toy, or a few treats for him. This focus on Hero had carried over into Teams meetings and other engagements, especially during the Covid pandemic as like many pets during this time, Hero had become a feature of the online meeting, helping to "break the ice", especially during work HR meetings, which were really the only interaction she had with work as she had been signed off, and was subsequently shielding due to the prevailing pandemic.

Revealing Hero had been her saving grace during this time, Claire said they had spent many happy hours, playing together and her being entertained by his antics, a welcome relief from daytime television. Claire did feel isolated both physically and emotionally, but Hero was there to chat to, and she would often provide a narrative to her daily life for him; additionally sometimes she would also disclose more of her feelings to him, telling him when she felt “shit” or needed to cry, rather than as she explained, the intricacies of the disease. The dependency on Hero was evident with Claire stating many times throughout our conversation that she didn’t know how she would have coped throughout the last six years without him, referring to herself as mummy, which whilst not unusual was tinged with sadness given her situation.

During these six years Claire had been in and out of hospital many times, including more recently as her vertebra had become compressed, due to progression of the metastatic disease. During these periods as an inpatient, she had missed Hero terribly. Carl had offered to bring Hero to visit her, meeting up in the car park, unfortunately Claire had found this prospect more distressing than not seeing Hero at all, as Carl would soon have to leave and take Hero away with him. She also felt it may be challenging for Hero as their attachment and bond was so strong; she had therefore made the difficult decision to be temporarily separated from him suggesting he be left at home; she had consequently found hospitalisation a very distressing time.

Claire missed Hero, not only because he offered support through his desire for closeness, intuitiveness, and unconditional love but also because she enjoyed stroking him, feeling his fur, which offered reassurance and had a calming effect. She had, therefore, on the advice of one of her therapists who had enquired about what she found calming, started to carry a piece of “fur like” material in her pocket, stroking it whenever she sought reassurance or felt herself becoming distressed, this tactile experience she emotionally connected with Hero’s presence. Touching the faux fur offered similar reassurance as would be gained from Hero being with her, although as she indicated it was not as good as the real thing but better than nothing.

On returning from those hospital isolations and in the instances she was able to be close to Hero, Claire would shower him with unconditional love, in return he offered emotional support, closeness, physical contact and a welcome distraction from the extreme anxiety, psychological distress, loss, and physical and emotional pain she was experiencing, which she identified impacted upon her life greatly. But recognising her mortality and having recently been in hospital, Claire and Carl had also on occasions discussed whether Hero would outlive her or vice versa, whilst not wishing Hero anything untoward, the consensus was Hero would be very bereft if left and would be lost as inevitably would Carl, but Claire also felt reassured that Hero would be there for Carl should the worst happen.

To Claire and Carl, Hero, was just that, a Hero, a loveable rascal, non-judgemental, offering unconditional love, there to distract, comfort, lick away tears and give cuddles, an all-round “golden” boy who it was very clear, meant the world to Claire and Carl.

6.7 Analysis of Claire’s Story

Hero’s role in both Claire and Carl’s life was multifaceted; whilst a very dear pet he was also essential to Claire’s emotional wellbeing, providing her with companionship, comfort, and tactile interaction, acted as a facilitator of conversation, and promoted exercise. It was clear Claire and Hero had a very close relationship, so much so, Claire asserted she felt separation anxiety when parted from Hero.

I’ve just recently been an inpatient, think it was last month or month before for a week in hospital and it’s just, it’s really hard to manage without him...because I find it...just having him next to me and putting my hand on him, or stroke him or whatever, it’s just that comfort that I lack when I’m in a medical setting, I find very difficult, and that’s all I talk about when I’m in the hospital...”I want to go and see my dog, I want to see my dog.

Separation anxiety (SA), an extreme form of anxiety and distress correlated to a detachment from, or desertion by a significant other, or body perceived to be needed or desired (Silove and Rees, 2014), is a regularly studied phenomena in the canine world (Ogata, 2016; Thielke and Udell, 2017), the causative evidence as in humans, pointing to a combination of epigenetics and experience (Darling Rasmussen and Storebø, 2021). Correspondingly, separation anxiety is also documented in paediatric literature associated with early childhood experiences including exposure to separation from significant others, due to planned or emergency childcare arrangements and the impact of parental responsibilities (Kossowsky *et al.*, 2012). Characterised by stress reactions, including inconsolable distress, panic and an intense fear of themselves or a significant other being injured or harmed (a concern Claire identified later within our conversation, see page 141), SA may occur at any point in a mammalian’s life span. Manifested in response to phenomenon perceived as major stressors, SA has been recognised as a separate disorder in adults since 2013, when it was re-classified in the DSM-5 (Silove and Rees, 2014). SA is also beginning to be systematically investigated in the context of human-animal bonds (Dowsett *et al.*, 2020).

Attempts to alleviate the stress Claire experienced through permitted planned regular visits during Claire’s inpatient stays were rebuffed by Claire who indicated...

My oncologist did say to me a year or two ago when I was an inpatient, he said, “why doesn’t your husband bring him down the carpark then you can go out and see him and then they can take him away?” and I was like “no, then I’m miss him even more...because they’ll take him away

Hero also demonstrated some anxiety when separated from Claire.

When I go into hospital, my husband's like "I came home and let him out for a wee, and he's there running around the car in circles waiting for you to get out and you're not there, it's like where is she? What's going on?"

Contemplating the eventual permanent separation from Hero, Claire revealed...

We do have a conversation, this is a bit morbid for you maybe, but you know, I say sometimes to my husband, "I wonder who will die first me or the dog" because life expectancy for my diagnosis is 3 to 5 years, now I'm in year 6, which is going well, she says touching wood somewhere, but you know...he says "I really hope Hero dies before you, because he's just going to be looking for you everywhere"

Hero not only appeared to have close affection for Claire, but Claire felt was also attuned to her emotionally. A dog's attunement to an individual typically signifies the human-dog dyad is founded upon mutual respect and deep companionship (O'Connell, 2007). There are many documented examples of dogs providing emotional support that extends beyond the ordinary everyday relationship that might exist between "woman" and dog. The dynamics between Claire Guest and her dog Daisy, who assisted in the detection of Claire's ovarian cancer and providing invaluable support during her cancer treatment (Guest, 2017), being just one example. The implication within these anecdotes suggests the presence of a deeper level of intuition significantly influenced the quality of these relationships; it may be, therefore, as postulated by Albuquerque and colleagues, (2022) dogs have the ability to detect human emotions. Conversely Gergely and colleagues, (2017) hypothesised canines have an innate ability to detect the human mental state through intonation and differences in communication, whilst others have proposed it may be attributable to dogs detecting specific human behaviours (Reid, 2009), a change in pheromones emitted (Wyatt, 2015), hormones released in response to stress (Handlin *et al.*, 2012), or an inability to disengage from, or dependency on their main provider (Ogata, 2016). Devoid of evidence to concur with any specific theory or indeed that wellbeing is improved (Herzog, 2011), the basis of the dog's ability to be in synergy with their primary handler is to some extent irrelevant, if the guardian perceives an improvement in their mental health due to the intensity of the relationship with their dog, the companionship appears positive and both parties are benefiting.

Claire indicated she felt amazing connectivity with Hero...

I mean he's always been very in tune with my emotions...so he's been with us since the very beginning of this second diagnosis so is very in tune with our emotions, I suppose with being more emotionally challenged I suppose than a normal couple within this situation.

If he senses that I'm getting upset or ...he's straight over paws on my shoulders licking my tears, and just loving me...checking in being like "I'm here mum, ...don't cry", he knows before sometimes it even comes, like tears or anything he knows that you, that you are upset by the tone of your voice or your mannerisms or whatever... so he's massively in tune with me and my husband.

Despite spending the majority of time with Claire, Hero appeared to also have a good relationship with Carl, sensing Claire's vulnerability, then signifying to Carl when he detected a change in Claire's emotional state.

He'll indicate to my husband sometimes, my husband is there and he's like "oh Hero" as he becomes aware of the dog being responsive to my emotions, then he says to me "you alright love?" he's... I couldn't think of anything more in tune with me.

Citing Hero's acuity of hearing as grounds for his responsiveness to emotional changes, Claire said

He's never not listening or not in tune with what happens ... he doesn't miss a bloody trick.

Furthermore, Hero was alert to physical changes too.

If I am feeling physically unwell, he picks that up too, he just lays with me and won't leave me, so I presume that's him kind of knowing maybe...I feel he kind of knows when I'm not right, you know he'll just be with me and won't leave me.

Even when Hero was not physically with Claire, he was at the forefront of her mind, she would often find herself talking about him. In this way he acted as a social lubricant.

I always talk about Hero, I talk about him to everyone actually, you know, he is my child...

The function of Hero as a facilitator of social interaction for Claire was distinctly evident within Claire's dialogue; during the interview, Claire talked lovingly about him, and as we relaxed into our conversation he certainly appeared to be an effective social lubricant permitting us to have the depth of conversation which doubtful would have been achieved had we not had him as a focus of our discussion.

The role of a dog as a social conduit is not an unusual one, dogs are increasingly being employed as a "tool" to reduce social isolation (Wong *et al.*, 2019) to the extent within a teaching scheme they are cited as a method of initiating conversation (Simmons, 2017). This was particularly evident during the Covid pandemic, when social interaction was significantly constrained by social distancing measures

and restrictions on gatherings (Martin *et al.*, 2021), for some individuals the only human interaction they experienced during this time was a localised daily walk, consequently dog acquisition soared during the Covid pandemic (Anderson *et al.*, 2023), and the dog became recognised as providing a reason for people to be sociable whilst undertaking their daily permitted exercise (Oliva and Johnston, 2020).

Robins and colleagues cited in Fine, (2019, pg. 44-45) suggest interaction resulting from a chance meeting of strangers facilitated by the presence of a dog in a public environment may counteract the anonymity of such a place, stating a dog could be the “antidote for the human anonymity of contemporary society’s public places” (*ibid*, 2019). Hospitals are public environments, regarded by some as frightening places where loss of control, although not intentional, is inherent, due to complex medical processes and treatments which may be painful or debilitating (Devlin and Andrade, 2017). Throughout Claire’s cancer experience, she had visited the hospital multiple times, for chemotherapy treatment, follow up appointments, tests, and receipt of test results which she found particularly stressful. Focussing on Hero provided a welcome distraction, a method of diffusing difficult interactions.

Claire had been required to shield during the pandemic due to her immunity status (Smith *et al.*, 2022); although she had continued to complete some work, it had been conducted through online methods, resulting in her social interactions being significantly curtailed. Whilst she had managed to continue to exercise Hero during her confinement it was predominantly in a private field, only in the company of Carl. Claire said she felt lonely and frustrated, this she associated with having cancer, particularly advanced disease, revealing friends had difficulty with knowing what to talk about when they met; employing Hero as a focus for these conversations had permitted them to flow more freely, thereby avoiding the awkwardness of friends not knowing what to say.

I think not only does he help me, obviously, but he helps me I think to communicate with other people in a positive way, rather than, because you know there’s not much to my life at the minute, but sitting around the house, watching telly and frigging cancer, and you know people find it very difficult, they don’t know what to say to you, they don’t know how to broach the subject, and they don’t really want to ask you if you are whatever, but you know they can always ask “well how’s Hero?, what’s he doing”...it’s that initial engagement that I think many people really struggle with, so it kind of breaks the ice in lots of different scenarios

The function of Hero as a catalyst for conversation was also pervasive in Claire’s more formal work-related communications. During the pandemic with most people working from home, the sight of a dog on the lap of an attendee during an online meeting became the norm (Young *et al.*, 2020); so it

was for Claire, who was unable to return to working in the office, therefore, had been arranging meetings with her line manager and Human Resources representatives via the internet.

he'll come and sit on my knee, and he'll be involved in the meeting...and then my line manager might go "how's Hero" so it's just a nice positive, kind of...it always relates to positive things for me...so it reinforces something nice for me rather than people saying "how are you? what are your latest scan results?"

You know, like sometimes I'm just sick of bloody talking about that stuff, and when I want to talk about it, I will let you know, I'd rather talk about Hero and his latest curly hair style...

Recognising the challenges of the situation not only for herself but also for Carl, Claire believed Carl also benefited from the social lubricant function Hero provided, indicating Hero was popular in many locations especially the local pub where Carl would go to regain a sense of normality.

...it's just everywhere you go, I suppose it's nice because people talk to you because of the dog don't they, so even if my husband's on his own, and I think this is quite an isolating experience you know for me having this diagnosis but also for my husband trying to cope with it as well...

The pub was one place where they felt comfortable. Claire disclosed she suffered from extreme anxiety, feeling vulnerable to the extent it severely restricted her activities, even before the onset of the pandemic. A feeling of vulnerability may arise as a trauma response (Bernardi *et al.*, 2016), be associated with nature or nurture or be sporadic with no clearly definable causative factor (Lantheaume *et al.*, 2022). A cancer diagnosis which is often an unexpected shock may increase feelings around vulnerability (Madsen *et al.*, 2019); living with a potentially life limiting condition which can be unpredictable in terms of progression and severity, widely recognised as having the ability to spread and metastasise, may lead to the vulnerability associated with thoughts around the cancer reoccurring, and other related trauma which can translate into a more generalised vulnerability affecting everyday life (Vehling *et al.*, 2019). Claire identified feelings of vulnerability several times throughout our conversation, these were connected to thoughts around mortality and loss.

...I just suffer hugely from anxiety, and I've met a lot of women in the same position as me and over the last six years about fifteen... twenty of them have died so death is very much at the forefront of my mind and end of life and palliative care, and all that kind of stuff which I didn't think I would be thinking about in my late thirties early forties, but um, so I have a huge anxiety with death...I've had lots of therapy around this

I'm alright when I'm driving but when someone else is driving I'm thinking "we are going to crash and die" ... the other one is when Hero goes out I worry he's going to get attacked and killed by another dog

Claire was receiving psychological support to manage the extreme anxiety she was experiencing; she recognised the dependency she had developed on Hero as part of her coping mechanism.

I'm sure I would have had some kind of nervous mental breakdown, that's not being OTT, that's realistic in this situation, we wake up altogether as a pack "we call it a pack don't we Hero" and we go to sleep altogether as a pack, and the pack's not complete if one of us is not here

I dread to think what this whole six years would be like without him you know. dunno I just feel he's like an extension of me, my treatment whatever you want to call it, you know, it's my ...we call him my therapy dog

We always say what would we do without him, because he just helps us get through this shit storm that we are in

Dependency is an inability to disconnect from a significant other to enable development of identity and confidence which permits self-worth and independence (Birtchnell, 1988). Lass-Hennemann and colleagues, (2022) analysed the correlation between an individual's emotional attachment to their dog and their mental health, determining, in line with previous research, strong emotional attachment with a dog predicted higher mental health burden; moreover, this could be mediated for by development of a stronger attachment to humans, however those closer to their dogs were less trusting of others, so unlikely to develop strong human attachments. Thus, dependency acts as a mechanism whereby the dependent has a need to be close to others or in this case a dog. Whilst theoretically a maladaptive coping mechanism (*ibid*, 2022), the situation complicated by the existence of Covid posed a unique series of events, where Claire certainly felt the benefits of depending upon Hero.

One of the most distressing situations Claire encountered, where Hero was not available to offer comfort, was when she received test results

I find, it really hard to go to the hospital on the times especially when I've had a scan and am getting the results", it's just the hardest time and it's just horrible, I mean having the scan is fine, but going to find out the results of that scan and waiting in the waiting room, it's just... I can't even describe the unbelievable terror, fear and anxiety and everything that comes along with that, especially the just sitting and waiting which sometimes can be an hour or two.

Claire identified in conjunction with her therapist, a tactile substitute may be beneficial in situations where Hero was not permitted

We were discussing ways in which we could help my breathing which is a bit of a problem, so we were trying to control that a bit more, but also she was like do you like, what do you find a comforter, and I told her "I like to touch soft things like fur, well I like stroking the dog he calms me down, just to know he's next to me, and there and I'm stroking him I find it relaxing and it's as simple as that", so my therapist said to "maybe get something that's a bit furry like a cushion cover", you can get all sorts of stuff can't you, or she suggested I "just get a bit of material and cut the edge off" so I could take it with me and have something that feels like Hero when in the hospital.

Companion animals are often recognised as having a vital role in the wellbeing of their guardians (Nieforth and O'Haire, 2020); dogs in particular have been cited as providing many therapeutic benefits (Marcus, 2012), including reducing blood pressure (Allen, 2003), helping combat fatigue and improve mood (Johnson *et al.*, 2008), and increase wellbeing within a paediatric oncology setting (Osório and Silva, 2017), these benefits may be gained through planned interactions, exercise, or spontaneous encounters, as in the case of the social catalyst effect.

Whilst today the term pet is synonymous with a companion animal, the word is derived from the phrase "to pet", which translates as to touch or caress (Longman, 2014); although recently touch has become more of a taboo subject (Linden cited in Jewitt *et al.*, 2021), it has long been recognised as a therapeutic tool (Field *et al.*, 2020), from which the speciality of haptics has developed (Jewitt *et al.*, 2021). As has previously been identified see page 51, stroking a dog or simply being in the presence of a dog may initiate the release of oxytocin, a neurotransmitter recognised as having inhibitory effects against cortisol, the stress hormone (Nagasawa *et al.*, 2009; Handlin *et al.*, 2012). Consequently, a canine companion may help alleviate anxiety (Beetz *et al.*, 2012), although there is some debate as to whether this is as a direct result of the oxytocin release or due to the social buffering effect (Morrison, 2016). During the Covid pandemic human to human physical contact, which is known to stimulate the release of oxytocin (Cascio *et al.*, 2019), was curtailed not only by social distancing regulations (Public Health England, 2020), but whereas before the pandemic many health professionals would have held the hand of someone receiving bad news or going through a difficult procedure, most health care staff during the Covid 19 pandemic were required to wear protective disposable gloves and minimise direct contact, resulting in that all important skin to skin contact not being initiated (Nist *et al.*, 2020).

Being starved of haptic stimulation, known as touch hunger (Durkin *et al.*, 2021), has been associated with an increase in anxiety, depression, and stress (Eckstein *et al.*, 2020). Initiating touch through animal encounters when human to human interaction was prohibited has resulted in a substantial number of researchers postulating dog-human interaction may act as a substitute for humanoid touch (Young *et al.*, 2020). Leading experts in haptic technology have tried to capture and mimic the

therapeutic effect of touch through the use of robotics (Gustafsson *et al.*, 2015; Petersen *et al.*, 2017). Studies have led to the realisation that one of the most pleasing forms of tactile stimulation is the touch of warm fur (Löken *et al.*, 2009), thus the robotic rabbit was born, a strokable interactive haptic creature mimicking human-pet interaction by responding to touch by “breathing” and moving its ears (Barras, 2008). Subsequently robotic dogs have been trialled in dementia settings; furthermore, newer prototypes with animalistic characteristics have been created (Petersen *et al.*, 2017).

Analysis of the effects of touch through investigation of the therapeutic effects of the fur when an individual is exposed to a stressful event demonstrated that an “ergonomic device in the form of a breathing huggable cushion” was the most effective prototype, reducing anxiety associated with a maths test, pre-test nerves, in a cohort of university students (Haynes *et al.*, 2022). Whilst this is a completely different scenario to those experienced by Claire, the developers envisage a haptic robotic device could be employed in situations or settings where a real animal is unable to be present (Haynes *et al.*, 2022), for example during anaesthetics or in settings where people may be immunocompromised, therefore, more susceptible to zoonotic disease (Chan and Rico, 2019).

Claire acknowledged

I know it's not Hero but it's the stroking of fur, it's a calming thing that I relate to, so yes that's something I'd never really thought about before until she mentioned that to me. It does help yeah; I suppose I relate it to him

In addition to distress associated with attending hospital appointments, slightly alleviated by haptic stimulation through the use of faux fur which mimicked Hero's coat, thus mediating a slight reduction in feelings of anxiety, Claire indicated she had become afraid of going out.

*I got very agoraphobic during Covid, I was only going to the hospital and back and that was it, because I've got huge anxiety, Covid didn't help. If it wasn't for Hero, I don't think I'd really...
I'm in my bubble with him at home...everything's brilliant in the world*

Claire, however, also considered exercise, being out in the fresh air as an important aspect of her wellbeing (Trigg, 2021). As has been discussed, see page 49, dog-guardianship can act as a catalyst for the undertaking of new or increased patterns of exercise, as dogs require regular exercise for the maintenance of their physical and mental conditioning (Westgarth *et al.*, 2015).

...having a dog can instigate a little bit of getting back into exercise like walking round the block first, then a little bit further...I think it definitely spurred me onto to do things, coz I'd do things for him rather than me, so it's had a better impact on me...I don't want, I love

him so much, I don't want to let him down, sorry I feel teary now thinking...I just love him so much, I'm fine [to Hero].

I do things for him, but then it has a beneficial effect on me as well, I don't think I'd have gone to the field, walking around the field, out in the fresh air or going around the block, stuff and all that lot without him.

The restrictions on public movement during the Covid pandemic initially meant Claire was limited to exercising in close vicinity of her home (Pringle *et al.*, 2022).

...so other than that, when Covid was going on, I was walking him [Hero] at six in the morning before people...I think a lot of people who are clinically vulnerable and have dogs were

Gradually as restrictions were modified people were permitted to travel a short distance to undertake personal exercise and complete essential work, Claire and Carl combined their activities including Carl's work duties with Hero's daily exercise.

My husband is a facilities manager ... he has keys to the site and everything so over the last couple of years during Covid, well we did this before any way, but we go to the field which is my safe place with the dog, and my safe place from Covid as well when that was kind of going on. My husband has the keys to the gate so he unlocks the gate and he locks it, and it's just us on the field and we can play frisbee, Hero loves frisbee, and we can just be outside with him and I can get a bit of fresh air and walk around and I feel safe, we've got that area open to us twenty four seven I suppose as he's the key holder for the site.

This enabled Claire to maintain Hero's exercise routine, enhance her wellbeing, be Covid safe and retain some sense of normality (Pearson *et al.*, 2021; Larkin *et al.*, 2022) in a time where there was so much uncertainty around the progression and longevity of the pandemic.

At the time of our conversation all remaining restrictions were finally being lifted, Claire was uncertain as to the implications of this curtailment and ongoing shielding requirements but was looking forward to regaining some sense of normality.

yeah I 'm like, well like any other dog owner, he's spoilt to bits like usual, and my husband, well he likes going on dog walks, because the dog will pull him into the pub

I mean I try and walk round the block with him, but because my fitness and my health haven't been great over the last year

Claire had not been into her place of work or spent a significant time away from home except for an occasional hospital visit, due to a combination of the impact of the cancer and the risk of contracting

Covid 19, consequently, she had expended a considerable amount of her time with Hero, becoming quite reliant on him for company.

If it wasn't for him [Hero] during the last 18 months, ...well we've spent so much time together because I normally work full-time, but we've been together twenty-four seven...

I need him, because I'm off work and Covid and everything, I say to my husband "you're not allowed to have him now, because when he's not here I hate it, I feel lost" ...

During the pandemic canine company became the norm for many people, although initially it was thought that pets, especially dogs due to their propensity for social contact, may have the ability to contract Covid and spread it through zoonotic processes, potentially acting as a reservoir for the disease mutations and consequently rogue versions of the virus, this theory was soon debunked; dogs were considered more as carriers of the disease, leading DEFRA (Department for Environment, Food, and Rural Affairs) to issue guidance around the contact and hygiene of pet dogs (DEFRA, 2020; Sharun *et al.*, 2021). Despite this risk, a massive increase in pet guardianship was seen during this period (Anderson *et al.*, 2023), dogs were frequently cited as providing an opportunity to engage in exercise, commune with nature and socialise, albeit at a socially acceptable distance, providing much needed psychological and physical support during this time of uncertainty (Mayers, 2021). Claire felt that she was not the only one who benefited from Hero's attention during the Covid lockdowns...

Sometimes my husband can get a bit jealous coz Hero's with me all the time, my husband is like "where's the dog? oh he's with you where's my cuddles?" but yeah he's [Hero] kind of evenly giving out the cuddles at the minute so its fine. They've got a boisterous boys club, they run around the house being boisterous boys and having fights and kind of stuff and I just want the cuddles. So yes, he's great.

It is said that an animal leaning into you, or putting a paw over your lap when you are sitting down is their way of giving cuddles or being affectionate, this may be accompanied by them initiating physical affection through nose nudges or a gentle paw; continuation of this behaviour is thought to signify the cat or dog is content, desiring ongoing attention and physical contact (Haywood *et al.*, 2021), the dog curtailing such activity or moving away, a signal to end the engagement. Claire recognised the cuddles and physical contact she associated with increased wellbeing, potentially initiating a release of oxytocin for both her and Hero (Marshall-Pescini *et al.*, 2019), needed to be on Hero's terms...

he's very, he's massively cuddly, he's six now, he wasn't massively cuddly when he was little, I don't know if as they get older, they get more cuddly, I don't know if that is a thing?

sometimes he'll go over and put his paws on you and go "kiss me, kiss my chops, kiss my chops", so yeah, he's brill

Brilliant not only for providing company and affection to Claire but on the occasions when Carl and Claire were unable to be together, Hero provided solace for Carl, especially during periods when Claire had been an inpatient, or uncertainties around the future had been at the forefront of Carl's mind...

It's not very nice for my husband when I'm in hospital because obviously he comes home on his own and he's thinking well one day I'm going to be on my ...going to be coming home on my own type of thing...and so, so he finds a huge...well last time...I was in hospital a couple of years ago for a week, and when I was in hospital he taught him little tricks and things, cause, cause they were alone together...paw, down, do this do that so I think he kept...I think he's really good for my husband as well.

We all now sleep together, so he sleeps in between me and my husband

Claire identified Hero as providing a welcome distraction from the stressful events in her and Carl's life. Distraction is a recognised coping mechanism (Kramer, 2010), or defence mechanism which can offer individuals an escape from unpleasant or boring stimuli (Bradford *et al.*, 2022). A deliberate act of reducing the impact of a stressor by implementing an activity or strategy directing attention away from the cause of stress, through enactment of thoughts or behaviours towards an unrelated phenomenon (Traeger, 2020), it is one of the foundations of cognitive behavioural therapy (Sage *et al.*, 2008), an intervention Claire indicated she had been receiving.

Claire and Carl struggled with the reality of the situation they were experiencing, this had resulted in them both becoming extremely stressed, causing tension and volatility between them, manifested as anger and distress. Hero through virtue of his presence and his attention seeking actions, had provided grounding through distraction successfully helping to diffuse the situations that arose...

Early days in the diagnosis, my husband was very frustrated and angry, a lot of that was down to the fact that he couldn't help me in any way what so ever, he was just helpless and that was that, and so his reaction to the situation was anger and my reaction to the situation was tears, which aren't the best combination, coz when I cried he got angry and when he got angry, I'd cry, um but, Hero was very good at diffusing those kind of situations

He'd just kind of come over and go "calm down dad" you know, "let's all just kind of reconvene and have a bit of a cuddle and have a chat get it out" and then kind of "watch me chase round my new toy" or whatever...

Grounding is a technique which literally involves connecting with the earth, through increasing the surface area of the body in contact with the ground, through lying down or mediated via the use of visual, auditory, kinaesthetic or scent sensory aids such as familiar sights, sounds, smells or haptics (Fisher, 1999); similar to distraction, the function of grounding is to redirect attention to something

more pleasurable and allow time for de-escalation of anxiety through re-evaluation of the effectuate (*ibid*, 1999).

When you know, when you are kind of like raising up to the ceiling in panic, anxiety, and stress...he can for whatever... kind of bring you down again, I just think it's just the greatest distraction from everything else, you know

It takes a special kind of dog to be able to offer grounding and not react to anger or human stress by becoming stressed themselves (Tedeschi *et al.*, 2010). Claire recognised the extraordinary attributes Hero possessed expressing her gratitude and love for him; his response to these situations was intuitive, he had not received any specific or assistance dog training to teach this behaviour.

There's not a negative thing about Hero really, it's just all positives for both of us and we always say what would we do without him, because he just helps us get through this shit storm that we are in, and I suppose it gives us, it gives us something positive to focus on, and that's what's really needed within the situation.

Claire was also acutely aware of projecting her emotions on to Hero. Psychological projection is an immature defence mechanism first identified by Freud in 1894 (Cramer and College, 2015), instigated in an endeavour to disconnect oneself from distressing thoughts and feelings, manifested as an attempt to make a situation more acceptable and less challenging. Projection as a defence mechanism was later categorised by Vaillant, (2011) who proposed a hierarchy of defence mechanism identifying projection as a level two or immature mechanism, as it was thought to be associated with regression to childhood defences proven to be effective in the past (Di Giuseppe *et al.*, 2018).

He is a bit of a worry wart but that's because of me I've made him like that, I know that.

Projection may be seen as a form of anthropomorphism; whilst in this section of narrative Claire did not attribute a human emotion to Hero, fear is recognised as an emotion that is common to both homo-sapiens and canines (Kujala, 2017), however, through behaviours associated with her fear of moths Claire felt she had unintentionally projected her emotions on to Hero.

He's a bit, a bit wimpy, I don't like moths, we have like huge moths "I know I said the word moth" he just looked at me you don't like moths do you? "Oh no, there's not a moth, it's alright Hero". There was a huge moth, just fluttering around in the bedroom and because I was getting worked up, he was getting worked up, so every time I say moth or he sees something fluttering about, he's like "err, err, err", and runs to either myself or my husband, probably more to my husband because he's a protector, so yes I know that some of the things that I, some of the things I'm going through maybe has a bit of a negative effect on him

Projection can occur at any point in life although may be enhanced by the stress of coping with advanced cancer (Zimmerman *et al.*, 2019), often cited as projection to significant others (Di Giuseppe *et al.*, 2018), however, is increasingly being recognised in the animal world, as a consequence of the human-dog bond (Wilkins *et al.*, 2015). Claire, conscious of the impact of projection on her relationship with Hero attempted to moderate her behaviour, whilst maintaining her partnership with him, she was careful when choosing what to say to him, avoiding key trigger words.

I talk to him all the time.

I talk to Hero. It's normally just like, well it's pretty much the same as my mum does really, it's like a narrative what I'm doing "come on let's get going" and have a ...you know the normal kind of stuff, um so on a day-to-day basis its normally "come on let's go here" ...now let's do this or go and watch this, or have a sandwich or whatever...

Whilst confiding in a dog is not something unique to those with cancer, evidence indicates that people who are experiencing some kind of trauma or life changing event may engage with their dogs at a deeper level (Moody *et al.*, 2002), choosing to disclose their thoughts or worries to their dogs rather than off-load to a significant other (Walsh, 2009, pg. 483; Tedeschi *et al.*, 2010, pg. 60).

...it can be times where it's, when I'm emotional when I'll probably chat to him about how I feel, so I will say to him "oh Hero it's been an absolutely rubbish day, I'm so sad" and you know he's tilting his head listening, like they do and so I will kind of chat a little bit about, about things that obviously he won't understand, I don't say my tumour is 2.5cm or whatever, but I talk to him, I don't talk to him about the mechanics of the situation

Dogs are perceived as non-judgmental (Carlini, 2016; Nieforth and O'Haire, 2020) offering unconditional acceptance, in the form of a convenient listening ear when alternative emotional support is either unavailable, or a canine perspective is preferred. Claire affirmed the nature of her discourse with Hero.

I talk to him about the emotional side of the situation because I suppose that's what I link him to, so I'll say "oh, Hero I'm feeling brilliant today, really well, let's go", and I run around the house with him, or just do a treasure hunt with bones or whatever, and then other times when I'm having a shit day, or I'm just ill, you know sometimes...I've had a few weeks recently where I've not been able to breathe very well, I couldn't walk and I just slept a lot, but he'd be with me, and I'd be like "oh Hero today is a bad day, I feel like... my legs hurt" you know "I need you to look after me"

Analysis of communication patterns between humans and canines points to changes in voice intonation, pitch and emphasis as the significant factor when considering the effect of speech on the dog; whilst dogs have been cited as recognising specific words (Gergely *et al.*, 2017), with the advent of programmable speech buttons perceived by some as being a conduit to a two way human-dog

conversation (Trottier *et al.*, 2020), this theory is now being tested. Others believe it is the pattern of the sound, rather than the specific words spoken, to which the dog is responsive (Gergely *et al.*, 2017).

...any time you talk to Hero he's listening, and Carl really likes that about him, and Hero learns very quickly and he's just always...

As with the analysis of canine perception, it is somewhat irrelevant as to the exact mechanism behind the interpretation of the communication if both parties derive some benefit from the interaction, which appeared to be the case with Claire and Hero. Whilst Hero was unable to participate in the conversation he would respond with what was perceived as humorous antics, providing Claire with laughter, another form of distraction (van der Wal and Kok, 2019), cited as one of the key attributes of dog interaction in AAI (Beetz, 2017).

Hero is always doing funny things, he has these little routines, we laugh at him every day, he makes us laugh, more than once a day, we must, I can't even tell you how many times we laugh and don't think we'd be laughing if it wasn't for him, it's really emotional...

At this point Claire became tearful

...it's just so entertaining, I don't really need my tele when I've got Hero [Claire laughs]. Its entertainment twenty-four seven, I think it's like I said it's a great way of being able to communicate with others in a positive way, its leads me and my husband to diffuse really intense emotions and situations...

Laughter or humour therapy is acknowledged as being a method of resilience or coping with breast cancer (Melton, 2016), potentially reducing the probability of psychological distress. Employed as a form of distraction therapy, induced laughter is thought to have a variety of benefits for people with cancer; those reliably indicated through a systematic review completed by van der Wal and Kok, (2019) were a reduction in perceived stress and a lift in mood. Hero's antics certainly seemed to help lighten Claire's mood to enable her to continue with our conversation, which ended with Claire endorsing the presence of dogs as being vital for all dog-guardians experiencing cancer, citing it as an essential component for their wellbeing.

6.8 Diane's story

Diane's story, incorporating Diane, and her dogs Max (cocker spaniel) and Ruby (chihuahua).

Diane was the fourth participant in the study, her narrative was constructed from two telephone conversations held towards the end of the Covid lockdown period.

Three years earlier, whilst sitting down at home one day to type at her computer, something she did most days, as she worked from home several times a week, as her arm brushed against her breast, Diane detected an unexpected anomaly—a lump that she had been completely unaware of until then. Diane promptly contacted her GP, underwent an assessment, and was placed on an urgent two-week waiting list for a breast clinic appointment. Throughout those fourteen days, Diane found solace in the company of her faithful companion, Max, a cocker spaniel whom she had had since a puppy. Diane recalled cuddling Max and him being present with her, as a constant source of reassurance during this anxious waiting period.

Following a two-week wait, Diane had her clinic appointment, where she underwent a mammogram, a biopsy, and received a breast cancer diagnosis all in a single day. This was overwhelming for her, as she hadn't envisaged getting a diagnosis on the same day, nor had she considered the possibility of cancer as the lump had occurred so suddenly. She had initially assumed the lump might be due to hormonal fluctuations and had therefore gone to the hospital by herself. Diane left the hospital feeling devastated, everything around her felt surreal. She reached out to her sister, they later met at their mother's house. It was at this point Diane voiced that the rest of the event and subsequent period was unclear, she had understandably blocked it out of her mind.

Picking up the story after her lumpectomy, Diane recounted everything had gone smoothly, she had been in and out of hospital within twenty-four hours and since she was living alone at the time, her friends had kindly taken care of Max whilst she was in hospital. Additionally, friends and family had ensured she had everything she needed during her recuperation. Recognising she had only been apart from Max for a brief period, Diane expressed relief it had been a short duration acknowledging that a longer separation would have been extremely challenging. Diane empathised with those diagnosed during Covid and indicated she would have struggled if she been required to isolate or be away from Max for an extended time.

Diane made a good recovery from the surgery. Whilst there was a brief period when she was advised to avoid any strenuous arm movements, which would have included pulling on the arm during dog walking, Diane soon resumed her walking routine. After a few days of friends exercising Max, and Diane concluding Max didn't pull excessively so that wasn't a concern, Diane cautiously reinstated her walking schedule although choosing to keep her walks short and limit them to around the block for the time being.

Signed off work during her initial treatment and a subsequent six months of chemotherapy, Diane spent a considerable amount of time at home with Max. She remarked on how she had observed a

shift in Max's behaviour during this period which seemed to align with the time just before her breast cancer diagnosis. Max had become rather distant and less inclined to seek attention, although noting he wasn't typically an attention-seeking dog. However, after the treatment had finished, he started seeking more attention and affection, and had become less solitary.

Diane had cared for Max since he was a puppy, now at twelve he was quite old, in dog terms. Whilst he remained a wonderful companion and source of support, his limited ability to walk long distances and his tendency to sleep throughout the day had become more noticeable. Diane recognised she was "getting in a bad head space" and started thinking "what if the chemotherapy doesn't work" and contemplating her own mortality. These thoughts led her to actively search for a distraction. The distraction came in the form of Ruby, a Chihuahua puppy who provided companionship to help her through the chemotherapy. Max, being somewhat apprehensive around larger dogs and not being particularly large himself, found Ruby to be the perfect size, as Chihuahuas are among the tiniest of dog breeds. Diane explained she had consulted her oncologist to ensure there were no contraindications to her getting a dog at this stage. She mentioned being part of a social media forum for young women with breast cancer. Within the group opinions on acquiring a puppy during treatment were mixed, due to the demands of caring for a puppy and coping with the treatment. Nevertheless, her oncologist had given the green light, and her perspective was simply to "go for it" and deal with any concerns later.

Ruby didn't just provide a welcome distraction from the stress of the chemotherapy for Diane whilst at home, during hospital visits Ruby also acted as a bridge for communication. The chemotherapy staff Diane had become acquainted with would inquire about Ruby's wellbeing, and Diane would provide "pup updates" during each visit. Diane acknowledged there were a few instances when she did query her decision about Ruby's acquisition. These moments typically arose during the challenges of Ruby's toilet training and when Diane was feeling fatigued as a result of the chemotherapy, or whilst Ruby was being exuberant; however on the whole, Diane felt Ruby's presence had significantly improved her life. Even Max, who initially seemed displeased by Ruby's arrival, gradually became more settled and content with Ruby's companionship.

Diane coped well with the chemotherapy and subsequent radiotherapy, she carefully scheduled her activities around her treatment, anticipating the days when she might feel unwell or fatigued due to the side effects of the chemotherapy drugs. On the days when she had to visit the hospital, her friends would help take care of her dogs. There was only one week when she needed to adapt her walking routine, this was the week when she experienced severe anaemia and breathlessness, however

determined to persevere, and recognising her reluctance to seek assistance, she continued to take the dogs out but opted for a shorter walk within the local vicinity.

As a puppy, and a tiny one at that, Ruby was initially carried by Diane during their walks, but she quickly developed her stamina and could then walk for miles. Whether they took a short stroll or embarked on longer hikes, it was essential for Diane that they all went out together every day, even if only for a brief period. Diane found solace in nature, viewing it as therapeutic and a welcome distraction from thoughts of her cancer diagnosis and ongoing treatment.

Diane explained that she was the type of person who needed to be active and engaged, rather than staying at home or watching daytime television. Caring for Max and Ruby gave her a purpose, as they had daily needs that demanded attention. Additionally, taking them out for walks allowed for social interaction during a time when it would have been easy to isolate herself and dwell on her current situation.

For Diane, it was nighttime which proved to be the most challenging; it was when she was alone with her dogs. During these hours her darkest thoughts tended to emerge, and it was at this time that her dogs played a vital role in providing companionship, a reassuring sense of security, and a welcome distraction; they were her steadfast companions, providing unconditional love, affection, and a soothing presence, often choosing to rest on the bed beside her. This was especially comforting at a time when her mind was full of turmoil and uncertainties when she needed the assurance of their presence. Additionally, her dogs had an uncanny ability to sense when she needed moments of calmness during the day, joining her for a nap when fatigue or nausea overcame her.

Diane shared how spending months at home during her treatment, combined with Covid lockdowns, had deepened her connection with Max and Ruby. She emphasised that she would have been devastated without their support during this challenging and stressful period. Her dogs, along with her long-standing interest in yoga since her early twenties, served as her primary coping mechanisms. Yoga had become her preferred activity when she needed to relax and escape from the chaos of life. The relaxation session at the end of her yoga routine had become a signal for all three of them to engage in a calm bonding experience. Ruby would curl up on Diane's stomach as she lay on her yoga mat, whilst Max would find a comfortable spot nearby.

Despite her dogs' differing personalities, Diane explained that they got along harmoniously. Diane described Max as a somewhat solitary soul, by way of illustration she explained that he would initially join her on the sofa when she sat down but he would eventually migrate to the other end of what

was a large corner couch. In contrast, Ruby always sought closeness and would choose to be in physical contact, when at all possible, especially during the times when Diane was feeling the effects of the treatment, or she intuitively knew she needed her to be there.

Initially reticent of Ruby, Max had grown accustomed to her company. Whilst he generally was not interested in playing with Ruby, there were occasional moments when Max would find a new lease of life joining in and even initiating play, one of these times was during Diane's yoga practice, sometimes he would bring a toy to the mat whilst she was in the middle of a precarious yoga pose and place his muzzle near her face, as if to say "it must be playtime, as you are down here...with me".

As Max aged, he had slowed down, and Diane likened him to a "chilled old man." He still enjoyed his walks, but his stamina had diminished, and the distance he would comfortably walk was now around 3 miles, still a reasonable distance, but his pace had lessened. Ruby, full of energy, seemed to understand this and would patiently wait for Max to catch up.

Walking her dogs had become a crucial part of Diane's wellbeing routine and her path to recovery. Being immersed in nature brought her a natural sense of relaxation and sharing her love for the outdoors with her dogs had proven immensely beneficial during her cancer journey. During the Covid lockdown friends had also acquired dogs, leading to regular weekend gatherings where they would walk their dogs and chat.

It was evident from our conversation that Max and Ruby had played a pivotal role in Diane's recovery, and their continued companionship was an essential component of her ability to live well with breast cancer; in addition, they had, and continued to aid her in enjoying nature, staying active, and maintaining social connections during what had been a challenging period for her.

6.9 Analysis of Diane's story

It was clear Diane had experienced an immense shock in discovering she had breast cancer, but it was also apparent both Max and Ruby had played unique and distinctive roles in assisting Diane in accepting the breast cancer diagnosis, navigating treatment, and adjusting to life during and after the cancer. Ruby, in particular, had been a wonderful and invaluable distraction from the challenge of the chemotherapy, she proved to be a fantastic addition to Diane's life and a loving companion.

As explained by Diane who noted a recurring theme within the social media groups she was affiliated with, the merits of acquiring a canine companion following a cancer diagnosis is a phenomenon that

emerges as a discernible and not infrequent occurrence. Lopes-Conceição *et al.*, (2023) in their follow-up study of 466 women diagnosed with breast cancer, discovered over a five-year period post diagnosis pet acquisition within the group of women increased by 6.7%, a rise from 51.7% to 58.4% of women becoming pet guardians, the majority of pets acquired were dogs or cats.

*I got Ruby to help me through the chemo as, she was a distraction, I think going out for dog walks is a massive help for me, I was very lucky in that I was never like physically sick with chemo, and it was more like tiredness and that sort of thing ...
I did ask before I got Ruby, if there was any reason I couldn't get a puppy because of the chemo, because I didn't know if you weren't supposed to because of the germs or something but no concerns were raised. When I was in chemo, and the nurses are obviously trying to distract you, you see the same nurses every week so you kind of get...obviously I was just getting Ruby, so they were interested, asking lots of questions about, or chatting away like that.*

I know some people have had terrible reactions to chemo, they've been bed bound, I think it very much depends, I think they give you a focus, like I tell everyone to get a dog regardless of whether they are having treatment or not...but interestingly I'm on a forum , a younger breast cancer group thing, and there's always been quite a few debates on there about people getting dogs in treatment or not, and people were saying "I want to get a puppy, what do you think, shall I do it?" and there's very mixed opinions as to whether you should or you shouldn't, because of being ill, or the amount of work a puppy can take and that sort of thing, and some people want to be more cautious about that I suppose. I'm always kind of like "just do it", and worry about it later, which sometimes isn't the best thing but sometimes it really works, generally the people that do, never like say it's been a bad decision, they always say it's been a good decision.

This act can be interpreted as a resilient gesture, reflecting one's determination to face the future with defiance (Pehle, 2010, pg. 70). Additionally, it may be perceived as a proactive search for emotional support and companionship during the challenging phases of cancer treatment (Larson *et al.*, 2010). Ultimately, the presence of a canine companion can offer a welcome reprieve from the harsh reality of the situation (Orlandi *et al.*, 2007).

Distraction is acknowledged as being a coping mechanism (Traeger, 2020), effective in mitigating the impact of a stressor through the diversion of attention away from the source of the stress towards a less anxiety inducing focus, in doing so the emotional burden associated with the stressful event or episode is reduced and a temporary relief or serenity may be felt (Drageset *et al.*, 2010). It is believed this distraction can manifest in various forms, namely sensory, behavioural, and cognitive (Sage *et al.*, 2008, pg. 208-252); in the context recounted by Diane, it is evident Ruby served as a source of distraction encompassing all three of these dimensions (Drageset *et al.*, 2010).

Primarily, Ruby's mere presence may have constituted a cognitive distraction for Diane. Diane had to address Ruby's ongoing care and wellbeing, which entailed tasks such as feeding, supplying enrichment, attending to toileting needs, and ensuring Ruby settled for regular naps. This continuous cognitive engagement with dog-related responsibilities occupied Diane's thoughts, consequently reducing the potential to ruminate on the negative emotions of her current situation. Furthermore, Diane's need to satisfy Ruby's requirements, including regular exercise and toileting outings, could have resulted in an alteration to Diane's routine and behaviour, thereby reducing opportunities for her mind to drift back to the distressing situation she was currently embroiled in. Additionally, Ruby had great affinity for closeness and physical affection offering sensory distraction, which Diane saw as a positive characteristic, as embodied by these quotes.

Ruby, she's like a little ball of energy, she just wants to be with somebody, like I don't think it has to be me, it could be anybody, like she wants attention, like if anyone comes to visit she wants to be with them at all times, just likes, wants attention of anybody.

When I was feeling low, they were quite chilled, like if I had to go for a nap or lie down they would literally lie down with me, it's like they'd know, they didn't ask to go out or anything, they would literally lie on a bed or something, so they were quite calming I suppose. I don't know maybe it bonded us more because it was just us three, and we had a lot of time at home together I suppose.

They'll both come up here but Max he won't stay up on the sofa for as long, he'll come up then go and sit, it's like a big corner sofa so he'll go and sit down the other end, whereas Ruby is like, so basically I'm sitting with, you know, when your knees are bent to one side, she's sitting in the gap of my legs, and that's where she'll sit every time I'm on the sofa.

Ruby was able to offer plenty of opportunities for tactile stimulation and sensory interaction, a form of distraction, potentially leading to the release of oxytocin (Morrison, 2016), which would confer benefits to both Diane and Ruby, solidifying the emotional connection between them (Thielke and Udell, 2017), further contributing to the distraction from the prevailing stressor.

Consequently, even though Ruby may have initially posed some unwanted and unforeseen challenges, her arrival had ultimately had a positive impact, and her presence was regarded as extremely beneficial, and she had become a much loved and wanted member of the family.

This was especially pertinent at nighttime when Diane would be alone with her dogs and her thoughts, which at certain junctures during her cancer journey, had become quite dark (Currin-McCulloch *et al.*, 2023). Fear of recurrence is recognised as being prevalent in all age groups of women experiencing breast cancer, however, particularly prevalent in women under fifty years old. Schapira and colleagues, (2022) in their cohort of 965 women with breast cancer, aged ≤ 40 yrs, discovered 86.7%

of the young women experienced fear of recurrence around the time of their cancer diagnosis, this percentage gradually decreased over time post diagnosis although remained present for many years.

It might sound really weird but even just going to bed because I live by myself and then you're just not actually alone, so I think that would have helped a lot, you know coz I think night-time is the time when the worst thoughts can come in, so they'd just be a distraction it would have been lonelier living by myself

Pervasive nocturnal rumination and intrusive thoughts particularly associated with fear of cancer recurrence (Şengün İnan and Üstün, 2019; Gormley *et al.*, 2021; Schapira *et al.*, 2022) and sombre reflections upon the effectiveness of treatment and potential prognosis, are recognised causes of insomnia. In Martin and colleagues, (2020) study, within a cohort of 64 women with breast cancer 57.8% experienced clinically significant insomnia with fear of recurrence acting as a mediating factor, whilst Hwang and colleagues, (2023) ascertained “a wandering or racing mind” was attributed to lack of sleep experienced within their cohort of young women diagnosed with breast cancer, and whilst the presence of a partner may in some circumstances ameliorate the loneliness experienced, there is evidence to suggest that irrespective of being physically alone or not, feelings associated with survival may still prevail (Cohee *et al.*, 2017). Having Ruby and Max for company during the night proved comforting for Diane and enabled her to obtain some sleep albeit broken, especially in the early days of Ruby joining the family.

It should be noted dogs are known to have a different type of sleep pattern to humans, having many sleep-wake cycles known as polyphasic (Schork *et al.*, 2022), rather than monophasic (usually one main sleep-wake cycle) (Oriyama, 2023). There is a suggestion co-sleeping with a dog may result in night awakening due to the dog moving around or repositioning themselves (Shepard (2002) cited in Patel *et al.*, 2017), although Smith and colleagues, (2014) found this not to be the case, whilst Hoffman and colleagues, (2018) discovered dogs co-sleeping in their guardian's bed were less likely to initiate waking, as opposed to a dog sleeping in the same room, but not on the bed, or indeed a co-sleeping human partner. Additionally, Hoffman and colleagues, (2018) study of 962 female adult participants, 55% of whom shared a bed with a dog and 31% with a cat, identified having a dog close (in the same room) at night offered them a greater sense of security and comfort, scoring higher on the overall Comfort and Security Scale (mean score 3.217), than those with a cat (mean score 3.208) or a partner (mean score 3.123). If sharing the bed, the mean scores were higher, dog 3.514, cat 2.717 and human 3.343, it was suggested this may be due to the guardian being able to relax more, aside from the dog providing a protective role (Hoffman *et al.*, 2018) further they recommended research be undertaken to determine the factors relevant to the ability of the guardian to feel more at ease, enabling more restful sleep.

However, due to Ruby's young age, she would have necessitated continuous care throughout the night (Mitchell and Langman, 2023, pg. 95). This likely included the need to take her outside for toileting and assisting her in settling down after nighttime awakenings caused by hunger or disturbances. Puppies typically demand care around the clock and often do not achieve uninterrupted sleep until they are approximately sixteen weeks old (George, 2023, pg.10). Moreover, it's worth noting small breed puppies, due to their slower maturation and development compared to larger breeds, tend to require a more extended period for toilet training (APDT, 2010, pg.76). Consequently, it's likely that Diane faced many nights of fragmented or polyphasic sleep as Ruby progressed through her early development. Whilst this may have been an inconvenience, it could also have effectively served as a distraction, redirecting Diane's thoughts away from the fear of relapse or failure of the treatment towards Ruby and her needs.

In addition, Diane's affinity for yoga, an activity she had enjoyed since her early twenties and something Ruby appeared to take pleasure in participating in, as evidenced by her engagement in the relaxation and focused breathing exercises at the conclusion of these sessions, as embodied within this quote.

I think they are really calming, um yes definitely. I think I've trained them into calming, I do yoga so when I do my relaxation at the end of yoga, Ruby always comes and sits on me, when I'm doing my yoga relaxation exercises. Yoga is one of my go to's, to help with stress, I think it just gives you that time to kind of switch off, um, I just find it really relaxing, really calming...So you know when you have to lie on the floor at the end of yoga, and you're like lying there and she will literally come and jump on my stomach, curl up and will just lie there.

Yoga may have helped to mitigate the stress associated with breast cancer and its treatment. It is worth noting that yoga in isolation has demonstrated beneficial outcomes for women coping with breast cancer (Cramer *et al.*, 2017). The presence of Ruby as a companion during one of Diane's cherished activities may have augmented the efficacy of the yoga practice, with the proximity between them likely to have contributed to the release of oxytocin experienced by both Ruby and her guardian (Uvn  s-Moberg *et al.*, 2015). It is pertinent to acknowledge the release of oxytocin does not invariably yield mutual effects. Indeed, some studies indicate cortisol levels in dogs may rise as oxytocin levels increase in their human counterparts (Petersson *et al.*, 2017). However, within this particular context, Ruby's choice to remain in close physical proximity and maintain contact likely engendered mutual benefits for both Ruby and Diane (Beetz *et al.*, 2012).

It was certainly apparent from our discussion Max and Ruby had assumed pivotal roles in facilitating Diane's recuperation, their sustained companionship especially at nighttime had been an integral

element of her capacity to maintain a high quality of life whilst coping with breast cancer. Moreover, they also contributed to her engagement in yoga, preservation of physical activity, and cultivation of social ties throughout what had been a demanding phase of her life.

6.10 Conclusion

Although significantly different each story offered a unique insight into the life of women with breast cancer and their dogs. There were however, also some similarities between the stories, leading to the development of the emergent themes discussed in the next chapter.

7 Emergent Themes

7.1 Introduction

This chapter offers an exploration of the themes emerging from analysis of the four case studies. Whilst the relationship every woman shared with their dogs was unique, each helping in its own individual way, all were deemed fundamental by the participants to their overall wellbeing. In this section the principal findings will be reviewed, synthesised and patterns and commonalities highlighted illuminating the multifaceted dimensions embedded within the richness of the narratives of the lived experiences of the women.

Analysis resulted in the development of four themes under the umbrella of enhancement of coping strategies; these were positive distraction, social and communication catalyst, companionship, and benefits of visual and tactile interactions. Verbatim quotes illustrate the emergent themes. These themes will be further scrutinised and their position within the wider scholarly landscape analysed in the following chapter.

7.2 Positive distraction

Within the domain of psycho-oncology, positive distraction refers to the intentional efforts to alleviate psychological distress associated with cancer, through a shift of an individual's focus from the challenges of cancer to more positive aspects (Bradford *et al.*, 2022). This refocusing can emerge through engagement in activities the individual finds therapeutic or enjoyable and serves as a valuable tool in enhancing the overall wellbeing of individuals contending with the psycho-social dimensions of the oncological journey. The women in the study frequently highlighted instances within their narratives where their canine companions served as positive distractions, benefits stemmed from their capacity to entertain, provide avenues for physical activity, collaboratively develop new skills and through having a range of needs that had to be met.

Noteworthy examples include:

Andrea who participated in agility with her dog, as a means of distraction and a defiant vote in the future.

I joined an agility training group. and I just remember I don't know how I did it just running around this cold muddy field, it was really awful, but I was determined to carry on... (Andrea)

Barbara who derived pleasure from incorporating dog-walking into her post-surgery recovery and ongoing wellbeing.

It's nice to get out and walk her and get your mind off things... (Barbara)

Claire found solace and amusement through humour therapy, observing her dog play, even while contending with advanced disease.

Hero is always doing funny things..., we laugh at him every day, he makes us laugh...if it wasn't for him, it's really emotional. (Claire)

Diane, who whilst grappling with profound emotional challenges during chemotherapy, deliberately adopted a puppy, recognising her potential as a welcome and comforting diversion.

She was just a good distraction, some people would be like 'it's a mad decision because it is hard with a puppy', she definitely helped. (Diane)

Additionally, participants recounted their concerns particularly around fear of recurrence and how the relationship they had with their dog during this time had provided a focus and distraction.

*...you start thinking about death and your life expectancy...
I was given another breast cancer diagnosis (this time grade 1) and I felt like I'd been punched in the face. Over a few weeks of tests, my mind raced through the worst-case scenarios, and I had some very dark moments. On the plus side, even on the darkest days, the dogs provided structure and constancy. They had to be let out for a wee in the morning and fed and walked. (Andrea)*

...with Covid 19, I'm a bit frustrated that my annual mammogram has been postponed or cancelled, but you know there are more important people need to be seen, be treated, but it doesn't stop the fear, it doesn't stop the fear... that there could be something there. If I get down days worrying about the cancer coming back, with the mammogram being postponed, she'll [Lucy the dog] be here, she'll be my focus. (Barbara)

*...death is very much at the fore of my mind and end of life and palliative care and all that kind of stuff which I didn't think I would be thinking about in my late thirties early forties but um, so I have a huge anxiety with death.
There's not a negative thing about Hero really, it's just all positives for both of us and we always say what would we do without him, ...it gives us something positive to focus on, and that's what's really needed within the situation. (Claire)*

...because I was getting in a, in a bad head space, I was thinking you know, "what if the chemo doesn't work, what if I'm going to die" and I dunno, she [Ruby, Diane's dog] was just good distraction.

“...nighttime is the time when the worst thoughts can come in, so they’d [Ruby and Max Diane’s dogs] just be a distraction it would have been lonelier living by myself. (Diane)

7.2.1 Social and communication catalyst

Navigating social interaction following a cancer diagnosis can be challenging; partners, close acquaintances and others may struggle to find appropriate words or avoid emotional discussions for fear of causing potential distress (Adams *et al.*, 2017). Consequently, such dynamics may result in the person not being able to articulate their concerns or becoming isolated (Wong *et al.*, 2019).

A canine companion may serve as a channel for expression of fears or moments of reflection and provide an impartial listening ear (Evans-Wilday *et al.*, 2018). Furthermore, the mere act of discussing dogs, whether present or absent, can establish a shared ground within a conversation (Harmon, 2019). The experiences in this section revolve around dogs serving as a conduit for disclosure of information and the expression of emotions the women indicated they would have been hesitant to share with others, assuming the role of non-judgmental listener and facilitating social interactions within the contexts of the chemotherapy clinic and friends visiting the home.

7.2.2 Disclosure

Verbalising concerns are thought to be beneficial for the maintenance of good mental health in various settings (Stanton *et al.*, 2000); particularly in circumstances where wellbeing is compromised due to illness (Moody *et al.*, 2002) this practice appears to confer even greater positive effects. Whilst it is not possible to determine the precise extent of these benefits in the current context, these quotes from the participants exemplify the recurrent theme of finding solace in a non-judgmental canine confidant (Carlini, 2016).

I think I probably talked to her sometimes, you know, maybe say things that you may not say to people, just babbling away, it’s funny when you look back, the things I used to say to her. (Andrea)

I always talk to Lucy, I talk to her when I’m out walking, I talk to her a lot, she looks at me as though I’m bananas, I tell her things I don’t tell other people from time to time, again she just looks at me. (Barbara)

When I’m emotional is when I’ll probably chat to him about how I feel... (Claire)

7.2.3 Facilitating communication

Using a dog as a catalyst for social communication has the advantage that it can be initiated or employed by either party involved in the interaction (McNicholas and Collis, 2000). In the following examples, participants' dogs emerged as pivotal "enablers," either serving as the focal point of the conversation or facilitating involvement in specific activities by virtue of their presence.

The fact that I could take Missy with me really helped, as it didn't feel quite like I was going on my own and a dog is always a talking point. you know it's a way of communicating without.... (Andrea)

People find it very difficult, they don't know what to say to you...but...they can always ask 'well how's Hero?, what's he doing?'...it's that initial engagement that I think many people really struggle with, so it kind of breaks the ice in lots of different scenarios. (Claire).

When I was in chemo, and the nurses are obviously trying to distract you, you see the same nurses every week so you kind of get...obviously I was just getting Ruby, so they were interested, asking lots of questions about, or chatting away like that. (Diane)

7.3 Companionship

Historically, dogs have been acknowledged as exceptional companions due to their presence and desire to seek human company, fostering a relationship that appears to be mutually advantageous (Dotson and Hyatt, 2008). Notably for the women in this study the role their canine companions played was paramount in their initial recovery and ongoing survivorship, particularly amid the Covid-19 pandemic (Mayers, 2021), when stringent restrictions necessitated individuals curtail interpersonal interactions (Public Health England, 2020), and there was a potential for the participants to have become isolated.

They were just there, constant, reliable, and also open to uncomplicated affection. (Andrea)

...just having her here was company really, and I think it's good for...it was good for me mentally you know I didn't go stir crazy because I had her. (Barbara)

When I'm not right, you know he'll just be with me and won't leave me. (Claire)

...dogs are really loving and affectionate and I don't know they are just there, aren't they. (Diane)

7.4 Tactile and visual interaction

Oxytocin, recognised for its anxiolytic properties, has been observed to be released in both human guardians and their canine counterparts (Berns *et al.*, 2015) during tactile (Marshall-Pescini *et al.*, 2019) or visual interactions, (Uvn  s-Moberg *et al.*, 2015; Morrison, 2016). The initiation of such interactions varied, with guardians occasionally inviting dogs into their personal space, while at other times, their dogs autonomously initiated contact through paw touches or nuzzling actions (Haywood *et al.*, 2021). Regardless of the initiator all participants, as evidenced by the provided quotes, indicated they derived comfort from physical contact with their dogs, particularly during periods of emotional distress or illness (Young *et al.*, 2020), potentially triggering the release of oxytocin and subsequent cascade of positive effects, thereby reinforcing the dog-guardian bond.

You can cuddle them as tight as you can and whisper your fears into their ears - and all you'll get back is a simple affirmation of mutual and straightforward love. (Andrea)

She's had me at home all the time, she's great, she comes over and gives cuddles, she knows when you're stressed and things. (Barbara)

I find it...just having him next to me and putting my hand on him, or stroke him or whatever, it's just that comfort that I lack when I'm in a medical setting. (Claire)

Ruby has to be touching me... They are just great to be around. it's like an irreplaceable bond I suppose... I can't imagine being without them. (Diane)

Claire's mental health practitioner, acknowledging the pivotal role tactile interaction and cuddling Hero had on her wellbeing recommended the deliberate utilisation of this positive association of touch in coping with stressful situations. In circumstances where the physical presence of her canine companion, Hero, was not feasible, substituting faux fur (M  ller *et al.*, 2015) served as a pragmatic alternative, affording Claire some of the benefits associated with tactile interaction and provided a focal point for grounding (Fine, 2019), as indicated by this quote.

...she was like do you like, what do you find a comforter, I told her "I like touching soft things like fur", well I like stroking the dog he calms me down, just to know he's next to me, and there and I'm stroking him I find it relaxing and it's as simple as that", so my therapist said "maybe get something that's a bit furry..." so I could take it with me and have a something that feels like Hero when in the hospital... (Claire)

7.5 Conclusion

In summary, the four main themes emerging from analysis of the narratives were associated with the dogs' ability to provide positive distraction, act as social and communication catalysts, offer companionship, and facilitate tactile or visual interaction. The following chapter will integrate the

main findings and themes arising from the narrative analysis of the women's lived experiences, scrutinise and interpret their importance, whilst considering them within a broader scholarly context before proposing recommendations designed to enhance this crucial relationship.

8 Discussion

8.1 Introduction

This chapter provides a pragmatic exploration of the findings from the quantitative and qualitative analysis including a detailed scrutiny of the themes embedded within the richness of the narratives of the lived experiences of the women, denoted by the four case studies. The key themes as identified in the previous chapter, emotional closeness and companionship, disclosure including the role of the dog as a social and communication catalyst and the potential for the dog to provide positive distraction through visual and tactile interactions are discussed under the umbrella of enhancement of coping strategies and the impact upon QOL. Summary quotes support the discussion and help to illuminate the nature of the relationships the women shared with their dogs, recognising both the uniqueness and similarities of the bonds between dog's and their guardian's. Thus, this section will incorporate a thorough exploration of the main research findings, namely the overall FACT-B and mMDORS scores, the results of the mMDORS subscales and four specific questions, plus a summary of the participant's (women's) comments, as presented in the previous findings chapters (see section 4.7 and Appendix 10 and 13).

Results will be examined for their patterns and commonalities, significance, implications and be contextualised within the broader scholarly landscape, i.e. how they contribute to the existing body of knowledge associated with coping with breast cancer and the role canines play in the enhancement of coping strategies. Additionally, the limitations experienced during the research process in particular those associated with the Covid 19 pandemic, participant recruitment, research instrument selection and application of the methodology will be considered, finally a reflective account written in first person, presents the researcher with the opportunity to consolidate their thoughts and feelings about the research process and engage in a comprehensive reflective analysis of the entire scholastic experience, from the point of determination of the subject area, through to completion of the thesis.

8.2 Quality of life

A breast cancer diagnosis can evoke a spectrum of emotional responses. Whilst a small number of women with breast cancer may experience heightened levels of anxiety and despondency concomitant with a psychopathological diagnosis of depression or adjustment disorder (Mitchell, 2014), many other women manifest some degree of cancer-related distress. This distress often stems from uncertainty surrounding prognosis, effects arising from surgical interventions including lumpectomy or mastectomy which may have an impact upon self and others' perceptions of femininity, and temporary or permanent alterations in roles due to the effects of treatment or

severity of disease (Mazzotti *et al.*, 2012). Distress may present as an array of emotional states including sadness, fear, and discouragement, impacting upon overall quality of life (QOL) (Gundelach and Henry, 2016); it is often episodic, being related to events perceived to be more challenging by the individual, or maybe more pervasive and enduring.

In the current study, QOL was evaluated using FACT-B (Brady *et al.*, 1997). Scoring revealed FACT-B to be 93.6, the component scores being Physical Well Being (PWB) 19.81, Emotional Well Being (EWB) 15.93, Functional Well Being (FWB) 18.60 and Social Well Being (SWB) 17.99. A comparative analysis with a large US data set for adults with and without cancer, comparing FACT-G, and FACT-G7 (both of which are possible to derive from the participant-provided information to ascertain FACT-B (see Appendix 10), revealed the study cohort mean scores were comparable to those of the benchmark studies for people with cancer (Pearman *et al.*, 2014); mean scores varied by 1 to 2 points for PWB, EWB, and FWB, a difference of 4 points was seen for SWB. See Table 1 below.

Dimension of FACT	PWB	SWB	EWB	FWB	BCS	FACT-G7	FACT-G	FACT-B
Current study	19.81	17.99	15.93	18.60	22.06	17.52	71.90	93.96
Adult patient cancer sample of 4937 (Pearman <i>et al.</i> , 2014)	21.00	22.00	18.10	18.20		19.10	79.30	
US General adult sample of 1075 (Pearman <i>et al.</i> , 2014)	22.70	19.10	19.90	18.50		20.10	80.10	
Breast cancer sample of with cats or dogs (Kogan <i>et al.</i> , 2023)						13.73		
All cancer sample of 122 with dogs (Ingram & Cohen-Filipic, 2018)							67.01	

Table of comparative results

Table 1

It should be noted however, a proportion of this current data collection occurred amidst the initial phases of the Covid-19 pandemic, introducing an element of uncertainty that may have affected the findings, especially in respect of SWB as social activities were curtailed due to Covid-19 social distancing regulations (Smith *et al.*, 2022). Additionally, it is plausible some of the 4937 participants

in the Pearman and colleagues, (2014) study would have also been pet owners; this supposition is based upon the prevalence of dog ownership in the US which in 2016 stood at 38.4% of all US households (Megna and Bailie, 2024). Therefore, this alignment of data suggests the participant cohort exhibited FACT scores within the range anticipated.

Contrasting these results with those of Kogan and colleagues, (2023), who also employed the abridged version of FACT-G (Cella and Nowinski, 2002), known as FACT-G7 (Yanez *et al.*, 2013) in a study about pets as emotional buffers for women with breast cancer, reveals the average quality of life of the current study group was 17.52, whereas Kogan and colleagues, (2023) found it to be 13.73, indicating quality of life in the current cohort to be slightly higher, nearer the norm (Pearman *et al.*, 2014), possibly due to the research being focussed purely upon dog-guardianship rather than general pet ownership. Whilst the current study should be considered only in descriptive terms as the data set is significantly smaller than Kogan and colleagues, (2023), comparison of results with these findings and normative data (Pearman *et al.*, 2014) provides valuable insight into the influence of dog-guardianship on the quality of life experienced by those living with breast cancer, indicating from a quantitative perspective dog-guardianship had little impact upon quality of life of the research group, as measured by FACT-G (Cella and Nowinski, 2002) and the individual FACT domains, a finding echoing that of Ingram and Cohen-Filipic, (2018). Whilst a more comprehensive study may yield findings offering sufficient data for statistical analysis, the primary emphasis and focus of this investigation was on whether women perceived their dogs as contributing to an improved quality of life, and the benefits afforded by their canines.

8.3 Emotional closeness and companionship

Trends observed through analysis of the descriptive data (mMDORS), provided initial insight into the impact of breast cancer on the relationship between the women and their dogs. Findings of the mMDORS revealed all participants in the study appeared to have intense positive emotional connectivity with their dogs, as evidenced through the high scores for emotional closeness (EC), with all but one participant scoring over 3 out of 5 for EC, 77.8 % scoring 4 out of 5 or more, and 11.1% scoring the maximum 5 out of 5 (see Appendix 10), the higher score equating to a stronger bond and sense of empathy. Dog owner interaction (DOI) scores were similar with 96.3% of participants rating their relationship as 3 out of 5 or more, and 66.7 % 4 out of 5 or more (see Appendix 10). The higher scores indicate a greater likelihood of shared activities and positive enrichment. Costs (PC) were perceived as low, with 81.5 % of participants scoring between 1 out of 5 and 2 out of 5, and 18.5% identifying costs as just over 2 out of 5 (maximum cost 2.38, average cost 1.62) (see Appendix 10), a lower score indicating the costs of dog ownership were only considered to involve minor sacrifices.

These results suggest the women in the study perceived the relationships with their dogs as positive, valued, and only minimally inconvenient.

However, as this study primarily focused upon the psychological support afforded through the relationship between the women and their dogs within the context of their lived breast cancer experience, it is pertinent to consider the aspect of emotional closeness" in more detail. A comprehensive examination of the mMDORS "emotional closeness score" for each participant juxtaposed with the corresponding "emotional wellbeing" score from FACT-B (Brady *et al.*, 1997) (see Appendix 13) as discussed in the analysis of phase I chapter (see page 98) reveals that in the majority of cases, those scoring 4 or more (77.8%) in "emotional closeness" on the mMDORS also exhibited a score of 12 (50% score) or more for the "emotional well-being" category of FACT-B. However, two notable exceptions existed where both participants scored the maximum 5 for emotional closeness in the mMDORS but a relatively low score in "emotional wellbeing"; these being Claire and Zivah. In Claire's case it became evident throughout the interview with her, she was contending with considerable distress she attributed to the challenges associated with managing advanced stages of breast cancer (having been diagnosed with stage 4 disease), thus providing a rationale for the low score of 8.

Additionally, a subset of questions within the mMDORS provided specific insights into the relationship the women had with their dogs, particularly within the context of cancer, one of these questions being associated with companionship (Q22 "my dog provides me with constant companionship"). Findings indicated 63.0% of participants indicated their dog provided "constant companionship", whilst 66.7% strongly agreed with the statement (Q24) "my dog is there whenever I need to be comforted" (see Appendix), this implies a significant proportion of the women attached considerable importance to the presence and proximity of their dogs throughout their survivorship

Within the narratives the women recognised their dogs as "*constant, reliable*" (Andrea), "*loving and affectionate*" (Diane), indicating the company and proximity afforded by their dogs who chose to stay close, was greatly appreciated. Furthermore, several of the participants cited their dogs as contributing to their sense of safety and security especially when alone or in a challenging situation, all the women indicated their dog's offered companionship, especially when the women had been isolated during recuperation, during a phase of treatment or as a result of the then recent Covid 19 pandemic (Ratschen *et al.*, 2020).

Historically recognised as a “best friend”, (Benz-Schwarzburg *et al.*, 2020) dogs, along with other animals that coexist with humans, are known as companion animals, a term coined during the latter years of the last century (Kirk *et al.*, 2019). Defining companionship with a dog Dotson and Hyatt, (2008), suggest it is a relational construct emerging from the interaction with a familiar canine, characterised by three fundamental traits, behavioural, experiential, and attitudinal; identifying symbiosis and anthropomorphism as key components of human-dog companionship, along with a recognition of self being dog focussed, flexible boundaries, dog related expenditure and a desire to engage in physical activities with their dogs.

Whilst there is no consensus, particularly within the medical domain, whether cohabiting with a companion animal results in overall positive effect (Herzog, 2011), there is emerging recognition of the interdependence between human and animal health, and that health and wellbeing is not an individual entity but is formed of a network of relationships, including those spanning across different species (Kirk *et al.*, 2019). Classifying companionship into distinct roles, Veveers, as (cited in Dotson and Hyatt, 2008), identifies three categories, the first, "surrogate," includes the role of ameliorating for loneliness or providing physical touch, the remaining two roles include "social lubricant" and a “projective function,” where dogs are perceived as a “symbolic extension of the social self”.

The willingness of a dog to engage with an individual is suggested to hinge upon the strength of the human-canine bond (Benz-Schwarzburg *et al.*, 2020). In the scenarios described in the narratives, all the women conveyed that their dogs were eager for interaction and proximity, suggesting a mutual beneficial relationship characterised by affectionate engagement with their caregivers or guardians. Although measurement of the strength of bond was outside the remit of this study, within the narratives dogs were cited as being responsive to their guardian's behaviour changes, displaying a natural inclination to remain calm and settled during times of illness or relaxation; whilst it may be possible dogs possess an innate ability to detect illness in their guardians and respond empathetically (Custance and Mayer, 2012), it is suggested their acute sensitivity to changes in body language, routines (Reid, 2009), and their inherent sociability (Ogata, 2016) provide a more plausible explanation

Whilst the findings are intriguing, and there may be a potential link between the emotional closeness of the women to their dogs and their emotional wellbeing (see page 98), a proposition substantiated by the findings of Trigg, (2021) who identified a positive relationship between cancer survivors' mental wellbeing and pet ownership, this is to the best of the researcher's knowledge, the only study investigating the association between women with breast cancer and their dogs employing a version

of MDORS (Dwyer *et al.*, 2006), comparative breast cancer studies, including Kogan and colleagues, (2023) and the research conducted by Ingram and Cohen-Filipic, (2018), assessing the “benefits, challenges and needs of people living with cancer and their companion dogs”, both utilised LAPS (Johnson *et al.*, 1992), therefore, further research is required to establish a more comprehensive understanding.

8.4 Disclosure to and about dogs

The women in the study found themselves conversing with their dogs on a regular basis. Twenty-two of the twenty-seven women participating in the quantitative study when asked about the frequency with which they shared information with their dogs that they would not willingly disclose to others, (Q13 “how often do you tell your dog things you don’t tell anyone else?”, admitted to sharing personal information with their dogs, the average score for this question was 3.31, corresponding with frequency of monthly disclosure, however, over 50% indicated they disclosed information on a weekly basis, and 33.3% daily, suggesting most of the women found some value in confiding in their dogs.

Whilst the women participating in phase II felt sharing thoughts and feelings about things they “*may not [have said to]*” (Andrea) or “*tell other people*” (Barbara), was therapeutic, particularly as the dogs were perceived as non-judgmental and willing to listen (Stanton, 2000). Enabling the conversation through virtue of either the dog as a distractor or “*talking point*” (Andrea) was identified as a helpful strategy by the majority of the women, helping to “*break the ice*” (Claire). Being a focus or topic of conversation permitted the dogs to act as a catalyst for social interaction thereby potentially reducing feelings of social isolation, decreasing the probability of the other party in the situation “*not knowing what to say*” (Claire) for fear of causing distress.

The women appreciated the opportunity to discuss their dogs as part of their care, with Claire indicating she seized every opportunity that arose to discuss her dog Hero, as it afforded her an avenue to engage in discussions of her preference rather than having to speak about her breast cancer. Similarly, Diane found comfort in sharing pup-updates about her dog, Ruby, when attending her chemotherapy appointments. Two examples of where discussion about the dogs was used as a form of distraction, and as a conversation enabler by the women as part of their active coping strategies.

Studies indicate women are generally more willing to disclose their concerns than men (Horne and Johnson, 2018). Moreover, Prato-Previde *et al.*, (2006) established women are also more inclined

than men to engage in conversation with their dog. Furthermore, women are more likely to confide in their canine companions rather than a close friend or third party (Evans-Wilday *et al.*, 2018). Hence, it comes as no surprise dogs are commonly seen as valued confidants or quasi-partners. This finding supports those of Kogan and colleagues, (2023) who, in their exploration of emotional support provided to women with breast cancer, determined over 70% of the 211 women surveyed felt their pets consistently (most or all of the time) offered a non-judgemental listening ear when they wanted to share their private concerns or fears, positioning them as attentive and understanding companions.

This characterisation of dogs as confidants and non-judgemental listeners was also evident within the analysis of the case narratives. Participants commented upon their dogs being “uncomplicated, willing to listen, in-tune and non-judgemental”, positioning them as valuable and in some cases essential assets to their care throughout their cancer journey. This vital role provided by a pet dog is often overlooked in a healthcare setting. Healthcare professionals (HP) engaging with women with breast cancer typically focus on enquiring about significant others or dependents when making conversation, especially if the woman is perceived as a caregiver, a single parent, or in need of additional support. Despite a substantial increase in pet acquisition over the last few years (Anderson *et al.*, 2023), enquiring about pets is not usual practice and it would be rare to incorporate such a question into an admission process or assessment form, but perhaps it should become the norm (Hodgson *et al.*, 2015; Currin-McCulloch *et al.*, 2023), especially in the UK, as it is estimated there are 13 million dogs (Anderson *et al.*, 2023), with 57% of a households owning a companion animal, and 31% of homes including a dog (Statista, 2024).

Enquiring about the role of the individual as a dog-guardian would allow the HP to ascertain whether the woman had any constraints on the time they can be away from the home to attend appointments, highlight the need to consider any potential implications of treatment side effects on the daily activities associated with dog-guardianship (Currin-McCulloch *et al.*, 2023), for example the ability to walk the dog post-surgery, and enable them to offer appropriate advice around infection control in respect of risk of zoonotic related infection during chemotherapy treatments (Hodgson *et al.*, 2015) particularly with reference to the risks associated with handling raw feed and waste products (Robinson and Pugh, 2002). Additionally, utilising knowledge about the woman's dog allows the healthcare professional to establish common ground during conversations.

Whereas the use of a dog as a communication facilitator or social lubricant is a strategy which may be employed by either party and has been shown to be an effective way of initiating or maintaining

a conversation (Wood *et al.*, 2015) but may, where prior knowledge of the existence of the pet dog by the health professional is lacking, become dependent upon the health professional being able to efficiently pick up on cues within a conversation (Butow *et al.*, 2002), which is an advanced communication skill. An example of this is when the woman says “ I’m not sure what Rufus will make of all this, me being...”, if the health professional is competent in the picking up of cues they may then respond with “you’ve mentioned being concerned about Rufus, is he your... ”, and a conversation concerning “Rufus” may ensue. An advantage of making initial enquiries about potential dog guardianship is the need for cue analysis is lessened and mutual ground established earlier on in the conversation, because the health professional is either able to establish based upon previous conversations the woman is discussing their dog, or the health professional can draw upon their knowledge about the dog to initiate a conversation (Yamasaki, 2018), in much the same way as they would when enquiring about the wellbeing or recent activities of the individual’s partner or children. Conversing about their dogs offered the women an avenue of discussion they found comfortable, one they attributed to the success of their coping strategies. This aversion away from a difficult situation may be thought of as a form of distraction, a coping strategy often adopted in relation to breast cancer (Cohee *et al.*, 2021).

8.5 Distraction

Positive distraction characterised by intentional behaviour to try and ease the psychological distress being experienced (Bradford *et al.*, 2022), in this case associated with a cancer diagnosis, often involves a deliberate engagement with activities the individual perceives as valid and enjoyable. The women indicated having the opportunity to “*get out and walk*” (Barbara) or have fun with their dogs by engaging in “*agility*” (Andrea) or “*playing frisbee*” (Claire) provided a welcome distraction. Whilst Diane’s search for effective distraction resulted in her adopting a puppy, Ruby, early on in her cancer experience.

Distraction, the deliberate redirection of attention away from stress-inducing stimuli through engagement in alternative thoughts or activities (Connor-Smith *et al.*, 2000), has been shown to be an effective coping strategy in cancer, mediating for worry associated with fear of recurrence, loss, and concern about ability to cope (Bradford *et al.*, 2022). Cancer-related distress may emanate from or be exacerbated by unmet needs (Markovitz *et al.*, 2015); evidence suggests dogs may help by providing emotional support through distraction (Binotto *et al.*, 2017; Chan and Rico, 2019), thereby potentially alleviating, or redirecting, excessive worry. Previously regarded as a maladaptive defence mechanism by Carver and Scheier, (1989), the current perspective posits distraction more as a coping mechanism (Vaughn *et al.*, 2020), especially when employed on a short-term basis or in tandem with

more long-term strategies, such as problem-solving, cognitive- behavioural approaches (Sage *et al.*, 2008), or self-compassion techniques. (Odou and Brinker, 2015).

Conversely avoidant coping involves a conscious effort to circumvent situations or thoughts perceived as highly stressful (Bradford *et al.*, 2022), both approaches may encompass a behavioural response; however, in avoidant coping, this response may involve activities aimed at evading the reality of the situation, and is often considered unhealthy (Carver and Scheier, 1989) hence labelled maladaptive (Waugh *et al.*, 2020). Distraction is thought a transient mental respite from the emotional challenges posed by the stressor, encompassing a shift of attention toward more favourable thoughts (Nolen-Hoeksema *et al.*, 2008); this opportunity to temporarily disengage allows for the cultivation of coping skills and development of new perspectives. Therefore, as outlined by Connor-Smith and colleagues, (2000), both distraction and avoidance are forms of disengagement; in avoidance, the individual withdraws from the stressor, and makes no endeavour to cope, whereas distraction entails disengagement from the stressor whilst concurrently engaging in a coping mechanism.

According to Waugh and colleagues, (2020), there are two distinct forms of distraction; positive, characterised by the induction of positive emotions emanating from involvement in pleasurable activities, and neutral which is associated with diversion of attention through participation in routine or everyday activities or tasks. Whilst both disengagement strategies yield advantages compared to avoidant coping, positive distraction leads to a more substantial reduction in symptoms of depression (Fredrickson *et al.*, 2003), as well as enhanced wellbeing and positive emotions (Waugh *et al.*, 2020), which may themselves confer physical and psychological benefits including the release of dopamine (Tugade *et al.*, 2004), leading to clearer thinking, improved problem solving and ultimately greater adaptive coping, a phenomenon known as the broaden and build theory (Fredrickson, 2001). In respect of breast cancer, engagement with positive distraction in conjunction with refraining from use of avoidant coping strategies may also reduce the probability of, or help to alleviate, cancer related distress (Cohee *et al.*, 2021).

Additionally, positive distraction may be categorised as being behavioural, cognitive, or sensory (Sage *et al.*, 2008, pg.82). Behavioural distraction entails purposeful physical actions that result in a behavioural shift (Gonzalez *et al.*, 2016), these activities do not necessarily need to be challenging or mentally taxing; they can be ordinary tasks deemed positive that demand sufficient focus to divert the mind from dwelling on negative thoughts. In the context of dog-guardianship, this might include attending to the dogs' needs. For instance, Claire enjoyed grooming Hero, whilst Diane was occupied

looking after Ruby, her young puppy; other distracting activities shared by the women involved exercise, including walking, or in Andrea's case running a dog agility course.

Cognitive distraction is associated with distraction through occupying the mind with alternative thoughts to those which may cause distress (Von Ah *et al.*, 2013), such as those the women experienced around fear of recurrence (which will be further explored later within this chapter), or in respect of managing chemotherapy side effects; typical examples may include hair loss or anticipatory nausea and vomiting, anticipatory nausea and vomiting is a phenomenon manifested by pre-emptive thoughts of feeling sick triggered by associations with chemotherapy, such as specific smells or locations. The women reported that focussing their attention towards meeting the needs of their canine companions, observing their interactions with other dogs, and deriving amusement from observing their individual quirks and idiosyncrasies, served as effective mechanisms for diverting their thoughts away from their immediate circumstances. For example, Barbara gained enjoyment through watching Lucy disembody her stuffed animals and play with other dogs, whilst Claire found humour in witnessing Hero's playful antics.

Sensory distraction involves activating one or more of the five senses (Scates *et al.*, 2020), this may include visual distraction through viewing images or photographs which the individual finds pleasing or relaxing, or being in an environment the individual finds serene (Cimprich and Ronis, 2003). In the case studies the women frequently mentioned the desire to spend time outside with their dogs, in settings they perceived as being calming and tranquil.

Other forms of sensory distraction include those associated with scent (olfactory distraction), whereby inhaling soothing scents such as lavender may help alleviate stress and calm the mind (Franco *et al.*, 2016). Moreover, familiar scents linked to pleasant experiences may trigger the release of serotonin and oxytocin (Masuo *et al.*, 2021), contributing to a sense of wellbeing; this may include the scent of "dog", the women certainly appreciated their dogs being in close proximity, and undoubtedly their dogs would have had their own aroma.

Auditory distraction is achieved through listening to pleasant sounds, such as those of birdsong or a "babbling brook", or any harmonious noise the individual finds pleasing may promote relaxation and peace of mind (Lalezari *et al.*, 2022). Being outdoors with their dogs likely exposed the women to soothing natural sounds, thus contributing to the overall effectiveness of the distraction of spending time with their dogs.

Taste being another sense, can be used as a form of distraction, (gustatory distraction) (Gibson, 2012), although not one mentioned by the women. One method of distraction that was apparent within the case studies was that achieved through tactile interaction. All the women identified they found stroking and caressing their dogs made them feel relaxed and safe, especially during nighttime when their minds would wander and drift towards darker thoughts. Knowing their loyal companions would be nearby available for “snuggles” on the bed or sofa, whenever they felt down, provided a sense of comfort to the women. The warmth and tactile interaction would have provided a distraction through focus on a tangible activity (Greenlee *et al.*, 2017), furthermore this interaction potentially would have stimulated the production and release of oxytocin, dopamine, and serotonin (Elias and Abdus-Saboor, 2022), thereby not only providing a distraction but also fostering a boost in mood and emotional wellbeing.

Through the combined influence of behavioural, cognitive, and sensory distraction, interacting with their dogs provided the women various avenues of diversion, which the women generally viewed as positive, appreciating their dogs for their role in facilitating distracting, enjoyable activities, such as walking, participating in dog sports, and practicing yoga, as well as attending to their dogs' basic needs, through provision of regular care, enrichment activities, and through sensory distraction via companionship and tactile interaction offered an alternative focus. However, it is important to note not all distractions may be equally positive in terms of emotional impact, hence the value or emotional valence of each activity requires consideration.

8.6 Emotional valence

Emotional valence is the degree to which the focus of attention impacts positive emotions and is deemed significant in the assessment of whether distraction is categorised as positive or neutral (Waugh *et al.*, 2020). Positive valence is thought to evoke emotions such as love, belonging, and gratitude, whilst neutral valence may encompass feelings of calmness or peace (Warriner *et al.*, 2013). Conversely, negative valence might entail emotions such as fear or sadness (Ponari *et al.*, 2020). Although Feldman-Barrett, (2006) contends attribution of the term "positive emotions" may be misleading, arguing individuals experience emotions uniquely, and classification as positive is subjective, dependent on an individual's personal intrinsic feelings of valence, and whilst the precise interpretation of the emotional terms within the women's narratives remains open to scrutiny, and the researcher's influence in co-constructing the narratives (Gilbert and Stoneman, 2016) should be acknowledged, the women in the study did identify their dogs as conveying them feelings of “love, comfort, joy, and calmness”, additionally citing them as “constant, reliable, uncomplicated, clever

and golden”, indicating in terms of emotional valence, the dogs were generally considered positive or at worst neutral.

There were a few comments which could be construed as negative, these tended to be associated with the dog's personalities, and their interplay with other dogs, and included terms such as “cantankerous, grumpy, and solitary”; however, in the main the dog's interaction with the participants appeared beneficial and hence a positive form of distraction. It is important to recognise absence of negative aspects in the interview responses were expected, given the interview question was purposely inclined towards elucidating the positive aspects of dog guardianship in the context of breast cancer. This deliberate focus on the positives aims to leverage the beneficial aspects of companion dog guardianship to inform recommendations for the support of individuals undergoing similar experiences, this is in contrast to Ingram and Cohen-Filipic, (2018); Nitkin and Buchanan, (2020); Trigg, (2021); and Currin-McCulloch and colleagues., (2023), who additionally explored the difficulties and challenges associated with dog ownership within the cancer context. Moreover, not all human-dog relationships are guaranteed to be as positive (Herzog, 2011); various intrinsic and extrinsic factors, including the sociability and bonding capacity of the dog, living arrangements and the influence of others, be them human or canine, can significantly influence the dynamics of the relationship, potentially exacerbating stress and cancer-related distress.

Furthermore, dogs are adept at detecting and responding to changes in human behaviour (Reid, 2009), which may further impact the relationship dynamics and emotional wellbeing. Hence, the potential for a dog to serve as a positive form of distraction varies greatly on an individual basis; therefore, it is not advised for those with breast cancer to acquire a dog solely for this purpose, rather, individuals who already share a positive bond with a dog may find value in further nurturing this relationship for the mutual benefit of both parties.

8.7 Fear of recurrence

Study participants were asked as part of the mMDORS to gauge the ability of their dog to “help me get through tough times”, (Q20 “my dog helps me get through tough times”) which may relate to a fear of cancer recurrence. 81.5% of participants strongly agreed with this statement (see Appendix 13) signifying a large proportion of the respondents deeply valued their bond with their dogs during trying times. Although direct correlation between these outcomes and the cancer experience cannot be established (given the likelihood of respondents facing a diverse range of life challenges at any point), it does imply the women greatly appreciated the relationship with their dogs during difficult periods, offering some credence to the importance of providing mechanisms to maintain and

enhance the relationship between breast cancer survivors and their dogs throughout the cancer trajectory.

Furthermore, in phase II the women recalled how the relationship they had with their dog had fostered a greater sense of wellbeing during what they perceived as the bleakest period since their breast cancer diagnosis, stating *“the dogs provided structure and constancy”* (Andrea), *“focus”* (Barbara) and were considered a *“good distraction”* (Diane), ameliorating nighttime loneliness and providing comfort and companionship, when the women indicated their *“mind was [racing] through worst case scenarios”* (Andrea), *“worrying about the cancer coming back”* (Barbara) and contemplating *“death... and end of life”* (Claire). Suggesting the women’s dog served as highly effective forms of distraction, providing an alternative focus away from dwelling upon fear of recurrence (FOR), an aspect of living with breast cancer that is particularly pervasive (Schapira *et al.*, 2022), and a recurring theme within the women’s narratives.

Participants shared these thoughts could emerge at any point when they were physically alone, or alone within their reflective thoughts, and often occurred at night, when daily distractions abated and demands were less pressing, providing a more conducive environment for the infiltration of contemplative thoughts. Recognised as being particularly troubling, nocturnal related FOR may impact sleep and impede the all-important restorative healing processes that occur during rest (Helvig *et al.*, 2016), and additionally be associated with an increased risk of cancer related distress (Liu *et al.*, 2018). Described as a time when *“dark thoughts would creep”* in or *“getting in a bad head space”*, participants indicated their dogs were there for them, providing comfort, warmth, a listening ear to whisper into, cuddles, lavish kisses, lick away tears or be an object to cry on, offer a calming presence or motivation to carry on, and provide a sense of normality.

Thinking about dark thoughts may be considered a form of rumination (Curran *et al.*, 2017), a non-constructive, pervasive, thought process focused upon a personal issue or trauma (Brinker and Dozois, 2009), potentially leading to the development of depression and anxiety (Beck *et al.*, 2023). Rumination is further characterised by three aspects, *“brooding”* (Treyner *et al.*, 2003), or a worrisome focus upon negative aspects of a situation, *“depressive rumination”* (Nolen-Hoeksema *et al.*, 2008) which may perpetuate further depression, and *“diminished reflection”*, (Treyner *et al.*, 2003) which may hinder problem solving (Muris *et al.*, 2005)

Often considered similar, both worry and rumination are viewed as avoidant processes, with rumination potentially leading to withdrawal, and worry perpetuating a cycle of anxiety. Both may be considered forms of cognitive coping (Tanner *et al.*, 2013), as the outcome of the event can be

altered as a result of either process, however whether they are classified as maladaptive or adaptive is contingent upon how coping is defined (Nolen-Hoeksema *et al.*, 2008); a process frequently labelled as maladaptive may be perceived as an effective or positive coping mechanism given the appropriate context (Mercer, 2011).

Furthermore, a clear distinction exists between worry and rumination (de Jong-Meyer *et al.*, 2009), worry being a process focussed upon future events, whereas rumination involves introspection and contemplation on past occurrences, linked with experiences of loss. In the context of breast cancer, rumination could entail pondering factors that may have contributed to the onset of the condition, or perceived loss of an individual's previous state of health. This may include attempts to answer the "why me?" or "what is it about my lifestyle that has caused me to develop cancer?" question (Öcalan and Üzar-Özçetin, 2023).

Consequently, it is suggested FOR is more aligned with worry than rumination, or alternatively may be thought of as future-oriented rumination (Brown *et al.*, 2020). Either process may act as a precursor to depression and, or anxiety, and potentially could further reinforce both conditions perpetuating a vicious cycle (Nolen-Hoeksema *et al.*, 2008; Renna *et al.*, 2021), although Brown and colleagues, (2020) proposed depressive "brooding" needed to coexist with worry for the manifestation of anxiety, hypothesising past concerns may extend into future disturbing thoughts, and rumination in isolation is only detrimental when focused upon emotional response to the events being analysed (*ibid.* 2020).

There is a potential for successive self-reflection as seen in worry, to transition into rumination, and conversely rumination may metamorphose into worry, when individuals perceive greater control over a situation or experience a reduction in reinforcing factors, especially when there is an expectation on the individual to complete a task, such as caring for another (Nolen-Hoeksema *et al.*, 2008); for example this could be looking after an animal, as in the case of the women in the study.

Furthermore, Cann and colleagues, (2011) recognised two types of rumination: intrusive rumination, an involuntary cognitive engagement in response to stress, typically occurring immediately after an event, often traumatic, perpetuating repetitive thinking; and deliberate or purposeful rumination, incorporating cognitive reappraisal and sense-making of the current situation. The latter aligns more closely with a process termed self-intellectual reflection, proposed by Trapnell and Campbell (as cited in Nolen-Hoeksema *et al.*, 2008), and may be considered more adaptive in comparison to intrusive rumination, which is viewed as an avoidant coping strategy involving disengagement (Connor-Smith *et al.*, 2000).

In terms of detriment neither worry nor rumination is considered inherently more deleterious than the other, however the reappraisal component of worry, as observed in emotional-focused coping (Lazarus and Folkman, 1984), may be more effective in reducing the distress experienced in worry (Gross and John, 2003; Nolen-Hoeksema *et al.*, 2008) than in alleviating rumination. This dynamic interplay underscores the fluidity of cognitive and affective processes, wherein outside pressures and a sense of control can significantly influence how people think and feel about themselves and their situation.

Whilst the women in the study did not discuss in detail what they meant when they used the terms “dark thoughts”, or “getting in a bad headspace” when reflecting upon instances of solitary introspection, collectively they did articulate concerns associated with future health, losses, life expectancy and prognosis. Additionally, several participants acknowledged they had contemplated worst case scenarios, treatment failure, and their own mortality. Suggesting they were experiencing intrusive thoughts (Maheu *et al.*, 2021), which could be considered ruminative, however, given the emphasis on future concerns rather than reflecting on past events, it may be more appropriate to characterise them as worries. Regardless of the specific cognitive state, it was evident the women had significant concerns around recurrence and survivorship, which impaired their functioning and impacted upon their wellbeing.

Distraction is frequently reported as a favoured self-help coping strategy by those with cancer (Luigjes-Huizer *et al.*, 2022), also a technique often employed in a cancer care setting as a means to avert a patient’s attention away from a potentially distressing event or to promote relaxation to aid recovery (Chirico *et al.*, 2020; Scates *et al.*, 2020). Additionally, canine facilitated distraction is one of the most commonly posited rationales for efficacy of animal assisted interventions implemented within an oncological setting (Holder *et al.*, 2020). Whilst no specific theoretical framework for its effectiveness has been established, it is proposed this phenomenon functions synergistically with other oncological benefits, derived from tactile stimulation, social interaction and neurobiological impacts (Beetz, 2017)

In the context outlined within the narratives, the diversion of the women’s attention through interaction with, and thinking about, their dogs appeared to augment their coping capabilities. Therefore, given distraction has been established as an effective coping mechanism for addressing rumination (Nolen-Hoeksema *et al.*, 2008), it is reasonable to infer such a strategy could extend to mitigating intrusive thoughts related to fear of recurrence and mortality; the existence of a canine companion during times of emotional distress likely served to disrupt the women’s catastrophic

thinking, offered an alternative focus and provided the women with an opportunity to share their fears with their pets.

Acknowledging the presence of a dog during these instances extends the scope of research conducted by Currin-McCulloch and colleagues, (2023) wherein participants were requested to record ways in which their companion animals offered support during the “hardest” phases of their breast cancer treatment. Outcomes revealed pets played a pivotal role in cultivating a heightened sense of resilience and courage, leading to the conclusion the bond between pet and guardian was fundamental to mental wellbeing and should be preserved and nurtured throughout the cancer journey.

8.8 Tactile stimulation of oxytocin

The relationship the women enjoyed with their dogs provided them with many opportunities to engage in a range of tactile interactions involving skin to fur contact, thereby potentially stimulating oxytocin release (Odendaal and Meintjes, 2003). Sometimes initiated by the dog who would “*give cuddles*” (Barbara) or desired to be close and “*touching*” (Diane) or through the act of the guardian “*stroking*”, “*putting [a] hand on*” as Clare indicated her and Carl would do for Hero at night, or “*whisper[ing] into their ears*” as Andrea suggested, these opportunities for touch were welcomed by the women during times of distress, isolation and when feeling unwell.

Social touch refers to soothing, pleasurable interaction, evoking positive emotions between two individuals, inspiring a sense of wellbeing and contentment (Elias and Abdus-Saboor, 2022). In addition to offering a positive proprioceptive experience, stroking a dog has been shown to stimulate release of oxytocin, the hormone linked to social bonding (Petersson *et al.*, 2017), in both humans and dogs. Moreover, it promotes secretion of dopamine and serotonin, hormones and neurotransmitters closely related to oxytocin, responsible for generating feelings of reward and motivation (Morrison, 2016). Together with oxytocin, these hormones help temper the effects of the stress hormone cortisol (Dsouza *et al.*, 2020).

In the absence of data to support oxytocin being oncogenic, its role in human-dog interaction, particularly in the context of breast cancer may be perceived as beneficial (Ariana *et al.*, 2019), especially as oestrogen, responsible for modulation of the expression of oxytocin (Patisaul *et al.*, 2003) is usually purposely reduced as part of breast cancer treatment (Day *et al.*, 2020). Tamoxifen, an oestrogen receptor blocker commonly prescribed to women with oestrogen receptor-positive breast cancer, representing 70% of cases (Day *et al.*, 2020), reduces the effectiveness of somatic

oestrogen (Shagufta and Ahmad, 2018); although the relationship between oxytocin and oestrogen is complex and yet to be fully understood, there may be a corresponding reduction in oxytocin levels, therefore, the stimulation of oxytocin via an alternative process could be viewed as therapeutic in breast cancer (Ariana *et al.*, 2019), particularly as the proliferation inhibitory properties of Tamoxifen are observed as being enhanced in the presence of oxytocin (Cassoni *et al.*, 1994).

Stimulating the release of oxytocin and dopamine through tactile interaction with their dogs, a process independent to oestrogen levels (Yu *et al.*, 2022), the women will have been able to benefit from the positive effects on social behaviour, emotional regulation, and the stress response (Takayanagi and Onaka, 2022), achieved through activities such as cuddling, stroking, and, in Andrea's case, burying her face in her dog's fur. Due to the sustained release of endogenous oxytocin achievable via positive regular interaction with dogs as seen in a dog-guardian relationship, it is postulated interaction of this nature maybe more effective in creating a long-lasting oxytocin effect, compared to administration of pharmacologically derived oxytocin (Takayanagi and Onaka, 2022).

Furthermore, as research indicates oxytocin release occurs in both dog and guardian as a result of eye contact (Nagasawa *et al.*, 2015) or merely being in the same room (Nagasawa *et al.*, 2009) it is plausible the women benefited from additional oxytocin by just being close to their dogs without actually touching them. Moreover, studies have demonstrated viewing images of “cute” puppies may assist in promoting relaxation (Lavan *et al.*, 2023); additionally, as tactile interaction with fur has been found to induce oxytocin production (Odendaal and Meintjes, 2003), there exists a potential this phenomenon is replicated within the context of stroking synthetic fur (Müller *et al.*, 2015; Elizabeth A Johnson *et al.*, 2021). There is, therefore, growing interest in developing therapeutic haptic devices focused on stimulating the release of oxytocin, dopamine, and serotonin, as a means to mitigate the effects of cortisol (Haynes *et al.*, 2022).

These factors present promising therapeutic potentials which may be employed in an oncological setting. For example, encouraging women pet guardians (who recognise a positive connection with their animals) to bring a cherished photograph to look at of their pet to treatment sessions may prove beneficial in inducing an oxytocin release and corresponding positive emotions. Furthermore, offering faux fur samples as comforters to anyone who might benefit from tactile stimulation may be advantageous. These suggestions, along with others outlined in this chapter, will be further explored in the following section.

8.9 Summary

So far this chapter has highlighted the multifaceted role the canine companions played within the lives of the women. The findings revealed a strong emotional connection between the women and their dogs, with participants turning to their canine companions to express concerns and seek solace during times of distress, particularly surrounding fear of recurrence and prognosis. The women's dogs served as non-judgmental listeners, facilitated communication, and provided comfort during difficult conversations or challenging situations. Moreover, the dogs acted as effective sources of positive distraction, bolstering coping mechanisms, offering companionship and tactile reassurance, whilst potentially enhancing the holistic effect through therapeutic release of oxytocin.

The significance of the canine presence within the dynamics of these women's relationships cannot be underestimated, hence this study offers valuable insight into the potential for health professionals, and those in the canine industries and others, to implement strategies aimed at enriching the relationship between women with breast cancer and their dogs, thereby, potentially enhancing the women's coping mechanisms and their emotional wellbeing. These suggestions, along with others mentioned in this chapter, will be further expanded and scrutinised in the subsequent chapter.

Prior to this it is pertinent to consider the entire research process in relation to the limitations encountered and reflect upon the experience as an early career researcher.

8.10 Research limitations

A thorough review of the research limitations is a fundamental aspect of a comprehensive study (Theofandis and Antigoni, 2018), as it allows for a critical analysis of the methodology and findings, highlights any potential bias, assesses its reliability and validity, and explores any constraints and challenges encountered throughout the course of the enquiry (Price and Murnan, 2004).

By addressing these limitations in an open and transparent way, the researcher is demonstrating their understanding of the scope of the project, acknowledging the impact of the challenges on the outcome of the study, and is recognising their own limitations. Furthermore, this practice serves to enhance the credibility and rigour of the research, whilst also identifying directions for further investigation and future research (Price and Murnan, 2004).

The following section addresses the limitations and restrictions associated with the Covid 19 pandemic, participant recruitment, research instrument selection and application of the methodology.

8.10.1 Limitations associated with the Covid 19 pandemic.

Covid 19 had a significant impact upon both phases of the research study. Although commencement of phase 1 preceded the start of the pandemic by three months, as a consequence of the length of period required to obtain an acceptable number of responses to the questionnaire coinciding with the enduring nature of the pandemic, it is reasonable to postulate respondents may have been affected by the global health situation at the time, and this was reflected in their responses to the survey. Particularly as FACT-B (Brady *et al.*, 1997) focused upon wellbeing, a domain widely acknowledged to have been significantly impacted by the isolation and uncertainty prevalent during the Covid-19 pandemic.

In addition to the concerns associated with the escalating mortality and morbidity attributable to the pandemic (Msemburi *et al.*, 2023), the transition of routine medical appointments, including vital components of cancer care such as regular follow-up assessments, to online formats (Bizot *et al.*, 2021), coupled with postponement of medical screening procedures (Myers *et al.*, 2023), mammograms and blood tests, may have heightened apprehension around the potential of undetected disease progression (Kállay *et al.*, 2022).

The pandemic may also have had an impact upon the dynamics of the relationship between the women and their dogs (Nieforth and O'Haire, 2020), potentially affecting their responses to the modified MDORS (Dwyer *et al.*, 2006). Social isolation during this period may have precipitated the evolution or enhancement of the roles played by the dogs (Rohlf *et al.*, 2024). In some instances, they may have assumed more of a surrogate role (Veveers cited in Dotson and Hyatt, 2008) especially as many individuals spent additional time at home, often alone, having adopted remote working arrangements (Victor and Mayer, 2023) or due to pandemic shielding requirements (Smith *et al.*, 2022). Conversely, it should be noted the existence of conflicting messages regarding the potential risk of zoonotic transmission of Covid-19 (DEFRA, 2020), may have adversely affected the relationship.

The pandemic also led to an unforeseen hiatus between the two study phases, as there was a necessity to devise a computer interface to enable the modification of the data capture methods, prompted by the constraints imposed on in-person visits (Public Health England, 2020). Given the pre-Covid strategy entailed utilising in-person video recording for the Phase 2 interviews, it was determined participants expressing interest in partaking in the second phase would be requested to either produce their own recordings or written narratives, addressing the open-ended question which was posed to all candidates. One participant completed a series of videos, which they subsequently

uploaded remotely to the organisation's secure database, another authored a comprehensive summary detailing their experiences as a dog guardian living with breast cancer.

The initial intention was to apply a criterion to enable selection of participants from those volunteering to take part in phase 2 (9 participants), to interview, this resulted in 8 out of the 9 volunteers (those with the highest FACT-B score and highest score for emotional closeness of the modified MDORS (Dwyer *et al.*, 2006)), being contacted; however, due to lack of response, to secure an adequate number of cases to ensure the research was viable, all 9 of the volunteering respondents were approached, via a phased email, mailing process. This yielded two additional candidates who participated in telephone-based interviews following the Covid-19 pandemic.

This variance in initial data capture method and prolonged duration of data collection will have undoubtedly impacted the resultant narratives, which were constructed from the original data sources (self-video, own written narrative, or telephone interview), and subsequent follow up telephone-based interview. Furthermore, all narratives incorporated comment about the impact of Covid 19 on the individual participants; hence, it is reasonable to infer the pandemic exerted influence across all facets of the study.

8.10.2 Limitations associated with participant recruitment.

In view of data indicating 55,000 women are diagnosed with breast cancer in the UK each year (CRUK, 2024), coupled with projections suggesting there are significantly more female dog guardians in the UK than male (Anderson *et al.*, 2023), the completion rate of the questionnaire fell significantly below expectations. However, this observation should be considered within the broader backdrop of the prevalence of the Covid 19 pandemic, which resulted in many breast cancer support groups, (one of the key methods of participant recruitment) becoming temporarily inactive and in some cases permanently non-operational, thereby potentially impacting participation rates.

Data obtained from phase 1 study did fulfil its intended purpose, offering valuable insights into the quality of life experienced by women diagnosed with breast cancer, as well as nature of the bond between the women and their canine companions. Furthermore, the aim of phase 1 was to identify women willing to engage in the second phase of the research, hence, the impact of a smaller cohort of phase 1 respondents resulted in a reduced pool of candidates able to participate in phase 2. Inclusion of additional individuals in the phase 2 would have been preferable, as it could have enabled a more comprehensive exploration, and broader insight into understanding of how canine companionship contributes positively to the experience of breast cancer survivors. Therefore, if the

research were to be repeated, consideration should be given to alternative sources of participant recruitment, particularly in view of a significant reduction in breast cancer support groups post pandemic.

8.10.3 Limitations associated with the selection of research instruments.

Quantitative instruments employed in phase 1, were selected due to their alignment with the research objectives, their assessed reliability, and did elicit responses permitting a greater understanding of the individual's wellbeing and emotional dynamics with their canine companions. However, during the evaluative period, it emerged utilisation of the modified MDORS (Dwyer *et al.*, 2006) constrained the ability to compare results with similar studies including those of Ingram and Cohen-Filipic, (2018) which employed a version of FACT (Webster *et al.*, 2003). LAPS (Johnson *et al.*, 1992) is becoming one of the most frequently used instruments within studies assessing dog-guardian relationships, therefore, given its popularity, coupled with its established reliability and validity, it is recommended to enable increased cross study comparison, consideration be given to its use in future studies. As both FACT-G (Cella *et al.*, 1993) and FACT-G7 (Yanez *et al.*, 2013) were derivatives of FACT-B (Brady *et al.*, 1997), comparison in respect of this instrument was not so problematic.

Application of the narrative approach resulted in a substantial volume of data, of notable quality, this as noted by Hsu and McCormack, (2012) is significantly influenced by the formulation of the research question, and how it is articulated to participants. As a range of data capture methods (including self-video recordings, written narratives, and telephone recordings) were employed, it is conceivable despite the same question being posed across the different contexts, (as the question was written then sent by email in two instances while verbalised during a telephone conversation initiated by the researcher in the remaining two occurrences,) the variation in administration may have influenced the research outcomes.

Although the written question did generate rich data suitable for inclusion in the study, for methodological parity, it would have been advantageous if the researcher had been able to articulate the question at the onset of each data capture episode during the initial collection phase. However, it is plausible reduced researcher co-production during the initial data acquisition, allowed participants greater autonomy and freedom over the presentation of information. Participants may have felt relaxed, in control and more at ease to express themselves. It should be noted all participants were subsequently asked the research question during each follow up call, affording them the opportunity to offer further commentary throughout the conversation; in each circumstance they were only asked to disclose information within their comfort level.

Therefore, it should be acknowledged lack of uniformity of data capture method between participants may have impacted the narratives, associated stories, and resultant interpretation, as amalgamation of the transcripts from each data collection point, for each participant, contributed to the formation of the overall narrative for that individual.

8.10.4 Limitations associated with application of method.

Whilst the narrative method was an adaptation of the model proposed by Sundin and Fahy, (2008), which itself was based upon Denzin's 6 step interpretative interactionism (Denzin, 2001a) combined with (Lieblich *et al.*'s., (1998) holistic approach, lack of familiarity with techniques and the inherent subjectivity, intrinsic to the narrative approach, inevitably influenced the process of restorying and hence interpreting the lived experiences of the participants. In circumstances beyond the scope of the doctoral research, where feasible, it would be prudent to enlist a secondary researcher to independently analyse the interview data, to assess whether there is a difference or similarity of interpretation, thereby reducing the possibility of bias (Thyer, 2010, pg. 366).

From a moral and ethical perspective, it was imperative to respect the right of privacy of all the women throughout the research. Women diagnosed with breast cancer may face inherent vulnerability due to their health condition, independent of the challenges posed by the widespread COVID-19 pandemic prevailing at the time (Miguel Johnson *et al.*, 2021). Moreover, despite the potential for the disease status of the cancer to remain relatively stable post-diagnosis, it was recognised there was a possibility the participants could have fluctuating health, thereby influencing their participation in the study and responses during individual interviews.

Consequently, women agreeing to partake in the second phase of the study were contacted only once, via email, to enquire about their willingness to participate. Likewise, only one attempt was made, again via email, to contact those women who engaged in the initial stages of the phase 2 data collection to determine their availability for subsequent interviews. This would inevitably have had an impact upon the participation rate. Furthermore, as one of the interviewees who had taken part in the first part of the phase 2 interviews, despite experiencing significant health challenges, did not respond to the invitation to the follow up call, the volume of data obtained is not as plentiful as may have been achieved, had further requests for participation been sent. However ethical considerations take precedence over the quantity of data obtained, and it is felt richness of data was still achieved.

Delay between the phases of the study due to researcher time limitations, disruptions stemming from the pandemic, the need to analyse questionnaire responses, transcribe the interviews and complete

preliminary interpretation of narratives may also have influenced the overall participant response and consequently, the resultant narratives. Whilst involving a third-party transcriber may have reduced delays, the accuracy of the transcription then becomes dependent upon external parties and heightens the risk of unauthorised data dissemination, moreover subtle nuances inherent in the interviews may have been overlooked or lost. The researcher considered personal involvement in this aspect pivotal to the data interpretation. This approach allowed for a more intimate familiarity with the participant's stories, fostered empathetic engagement, and facilitated the researcher's growth, particularly given their novice status in respect of narrative analysis. However, it is acknowledged this approach may have prolonged the overall research timeline.

8.11 Summation of limitations impacting the research

The quantitative data (phase 1) served as a foundation for the narrative analysis conducted in the subsequent phase (phase 2), enabling a deeper exploration of the lived experiences of the selected participants. Through the amalgamation of the quantitative findings with the qualitative narratives, the study provides a holistic understanding of the complex bond between the women with breast cancer and their canine companions. The impact of the pandemic coupled with the selection of research instruments, researcher time constraints and lack of familiarity with the narrative process will have influenced the outcome of the research. However, whilst the study is constrained by limitations in data quantity, prompting recommendations for further investigation, it does offer novel, valuable insights into the beneficial impact of pre-existing relationships between women breast cancer survivors and their canine companions, particularly in terms of effective distraction. This new understanding, therefore, has the potential to assist women in similar situations to enhance their coping mechanisms, and holds promise for transferability to different cancer contexts, thus underscoring the significance of the research output despite challenges encountered.

These difficulties and other aspects of the research process will now be deliberated in the context of a personal reflective account.

8.12 The research experience – a reflective analysis

This reflective chapter, written in first person, presents the researcher with the opportunity to consolidate their thoughts and feelings about the research process and engage in a comprehensive reflective analysis of the entire scholastic experience, from the point of determination of the subject area, through to completion of the thesis.

Despite having attended several doctoral study sessions prior to commencement of my PhD journey, my understanding of the process was limited, to the extent I had not anticipated the PhD study would need to be within a specific subject area, therefore having presented my proposal there followed some discussion between my supervisors, as to whether it was more appropriate for it to have a psychological or sociological focus. Lacking familiarity with both academic domains, I realised at this juncture my PhD trajectory would incorporate a steep learning curve, hence my self-categorisation of novice.

Having determined a psychological approach was more fitting, I embarked upon my research journey, commencing with a literature review. One of the elements I particularly wanted to explore early on, was the relationship between oxytocin and breast cancer, I personally felt it was important for me to understand, whether engagement with a dog may perpetuate any harm; not that the research process itself would be encouraging individuals to increase interaction with their pets, it was more concern, production of a study identifying the benefits of companion animals set against negative biochemical effects may be contradictory, potentially resulting in ethical dilemmas. Having satisfied myself the probability of beneficence was greater, as recent studies appeared to concur with the theory oxytocin conveyed a protective effect, I continued my voyage of discovery, developing skills of detection, analysis, self-discipline, and organisation amongst others, which ultimately, I feel have contributed to my personal growth and further development as an early career researcher.

Conscious of ensuring the methods adopted would enable the collection of relevant data whilst not proving too onerous to either the participants, or in terms of feasibility of the project, I dedicated considerable time to critique of techniques selected, in combination with evaluation of previous use and interpretation. This included debate around question suitability and application to the study, consideration of other options and justification for chosen approach.

Data collection was frustratingly slow, which likely had an impact upon the overall response. This was in part due to Covid restrictions directly affecting the planned data collection method, additionally I was cognisant of the impact of the pandemic on the participants, the implication it may have had on their wellbeing, vulnerability due to their health status and did not want to burden them with unnecessary challenges during this period. Furthermore, accommodating participant submitted videos posed a significant conundrum, requiring the institution to deploy new mechanisms to enable remote upload, resulting in delay whilst systems were created. It should, however, be acknowledged, from a transferability perspective this has resulted in the availability of an innovative solution, which may assist future doctoral students.

Engaging with the narratives required introspection, self-appraisal, and existential questioning. I felt able to relate to the women, being of similar age, recognised and appreciated some of the challenges they had encountered during their breast cancer trajectory, however had not anticipated the extent of the support afforded to the women through the relationship with their dogs. Discovering how the women's dogs had enabled them to cope more effectively in the face of adversity and capturing the essence and significance of the special relationships, demonstrated how crucial determination, in conjunction with dog guardianship, had been for the women's wellbeing.

To me the women were inspirational; to be able to tell their stories was an honour, it was, therefore, vital I conveyed them with empathy, honesty and in an educational format accessible to others. However, in accordance with the pragmatic approach, fundamental to the execution of this study, this research is not truly completed until the societal impact is realised, and dissemination initiated, hence, this will be the focus of the next stage of my research journey.

8.13 Conclusion of discussion

In conclusion this chapter has offered a pragmatic synthesis of the main findings from the two phases of the research, resulting in a comprehensive analysis and interpretation of the lived experiences of the women participating in the study. Additionally, these have been considered within the broader scholarly context and the limitations associated with the inquiry process. Furthermore, the position of "self" within the research has been scrutinised and the need for effective dissemination of the inquiry findings in line with the pragmatic approach, highlighted.

The following chapter builds upon the emergent themes arising from the narrative analysis, offering practical ways and strategies for health professionals and those in the canine industries to cement the relationships women dog guardians have with their dogs, increase awareness and understanding of the importance of the dog-guardian bond in cancer care, and considers how the sectors could collaborate to enhance the didactic relationship, hence wellbeing of all involved. Additionally, suggestions for further research and development are proposed, with the ultimate aim of improved care and support for all women experiencing breast cancer.

9 Relevance of findings and recommendations

9.1 Relevance and recommendations - healthcare practitioners

It is evident from the research, appropriate psychosocial support is essential for the promotion of wellbeing amongst women with breast cancer; the women in the study cited their canine companions as indispensable contributors to their overall welfare, fulfilling unmet needs (Herzog, 2011) and assuming integral roles within the familial framework. Consequently, it is advised HPs invest time in learning about the roles played by companion animals (Nitkin and Buchanan, 2020), particularly dogs, in the holistic care of women navigating the challenges of breast cancer. This could be through engagement with the growing evidence base of research highlighting the benefits and disadvantages of dog-guardianship whilst coping with breast cancer, or via more anecdotal sources.

Taking time to enquire whether women living with breast cancer have any care related responsibilities for companion animals (Hodgson *et al.*, 2015), akin to the manner in which HPs enquire about responsibilities concerning human dependents, would enable the HP to ascertain whether the woman has any pet (dog) care challenges associated with attending medical appointments (Currin-McCulloch *et al.*, 2023), hospitalisation, or require guidance about adapting any canine care related activities as a result of recent surgery, treatment side effects, or an increased risk of infection due to suppressed immunity (Chan and Rico, 2019). Tailored advice may then be provided based on the information ascertained and comprehensive understanding of potential challenges. With that objective in mind, it is suggested the following short question be incorporated into admission and assessment forms or “survivorship records” (Trigg, 2021). “Do you have any pets at home which rely on you for daily care or support?”; depending upon response to this enquiry, further questions could be posed to clarify nature of the relationship between woman and dog, and assess any impact of hospitalisation or treatment.

Should a HP identify a woman living with breast cancer has a dog with whom they indicate they have a close relationship, this awareness can be strategically employed in various ways. It may serve as a means to encourage the woman's involvement in physical activities conducive to wellbeing (Forbes *et al.*, 2016; Trigg, 2021), such as walking with an organised group or with other canine guardians, (activities of this nature are often recommended as part of social prescriptions), or participation in low-intensity canine-related social activities, for example mantrailing, scent work or dog parkour all of which can be completed at a walking pace (this would be dependent upon physical condition of both woman and dog, it is therefore recommended the woman consult her lead physician and a

certified dog training professional to discuss appropriateness of any proposed activity before commencement).

Moreover, possessing knowledge about the woman's dog provides the HP with a conversational entry point when engaging with her, with the dog serving as a social facilitator or bridge (McNicholas and Collis, 2000). Where prior knowledge of the dog is absent and the woman herself uses her dog as a social conduit to initiate conversation, the onus falls on the HP to proficiently pick up and interpret cues (Butow *et al.*, 2002), thereby skilfully develop a dialogue based on what they are hearing, requiring them to be competent communicators and possess enhanced communication skills. It is therefore recommended future HPs communication skills training incorporate information on the crucial role dogs can play in helping to initiate conversation, in conjunction with how to recognise and respond to verbal cues.

For the women tactile interaction with their dogs was considered important, it offered them comfort and reassurance; evidence supports the notion touching fur, possibly including faux fur, triggers the release of oxytocin (Johnson *et al.*, 2021). Whilst it is acknowledged allowing pet dogs in an oncology setting is not always feasible due to potential zoonotic risk (Cherniack and Cherniack, 2014) and practical considerations, a viable alternative is to provide a tray of pieces of faux fur in the reception or treatment areas of an oncology department for patients and others attending the department, who may derive benefits from tactile interaction to help themselves to; this could be accompanied by a succinct explanation of the therapeutic benefits (see faux fur worry worm in Appendix 18) in much the same way as knitted or crochet “pocket hugs” (Royal Ottawa Medical Health Centre, 2023) may be available on a reception desk or in a waiting area. In the absence of dogs this initiative serves as a tangible substitute and may provide comparable positive neurophysiological benefits (Löken *et al.*, 2009) to women with breast cancer attending an oncology department or similar setting.

Additionally, as images of “cute” dogs have been identified as promoters of relaxation (Lavan *et al.*, 2023), encouraging pet owners to bring with them a pleasing photograph of their pet, when attending for treatment to look at whilst in the waiting area, the period when anxiety is typically high (Crist and Grunfeld, 2013), may help to reduce the stress experienced, especially if HPs use this image as a way to facilitate conversation; this phenomenon could also be used for positive effect by providing a folder or display board of stock images of “cute” puppies, which could be viewed instead of the standard magazines or books sometimes available in waiting areas, again potentially resulting in increased neurotransmitter activity and cortisol reduction.

The women clearly valued the support afforded to them by their dogs, especially during the night when thoughts of FOR became more prevalent (Gormley *et al.*, 2021; Şengün İnan and Üstün, 2019) and appeared to appreciate the opportunity to share their nocturnal concerns, with their dog as the constant companion and non-judgmental listener (Nieforth and O’Haire, 2020), but also with the researcher as part of the narrative gathering process. Given HPs are often hesitant about discussing FOR, due to discomfort with the subject matter and it being a difficult conversation (Liu, Beith, *et al.*, 2019). This knowledge of how the dog/s appeared to serve as a catalyst for fostering a meaningful social interaction and appeared to facilitate a more genuine exchange about experiences of FOR, emphasises the significance of exploring the deeper connection between individuals and their dogs, rather than merely asking basic questions about ownership or the dog’s name, and can pave the way for a more profound and meaningful conversation. Furthermore, gaining insight into a dog’s nighttime role can assist HPs in comprehending the impact of a hospitalisation and the emotional strain of being apart from a canine partner, which often holds significance comparable to that of being apart from a significant other.

Initial breast cancer treatment often necessitates short overnight hospital stays or a period of recuperation, both may involve a brief separation of the woman from their dog, with longer separations becoming more probable in the advanced stages of disease as with Claire.

Given the common practice identified by Hoffman and colleagues, (2018), of co-sleeping with dogs or them being present in bedrooms at night as in the case studies, it is recommended in advance of any planned admission for optimum sleep quality whilst apart, and to minimise potential stress for both the dog and guardian, where possible preparations for separation and adjustments to sleeping patterns should be considered. The specifics of this process should be tailored to the unique dynamics of each dog-guardian partnership, with potential guidance from a certified dog training professional if required to facilitate a smooth transition.

9.2 Relevance and recommendations - canine industry professionals

The bond between the women and their dogs was evidently meaningful and crucial for their overall wellbeing. Canine professionals can aid fostering and maintenance of this through the provision of specialised services and recognising the unique impact breast cancer may have on their clients.

In addition to the earlier suggestions for preparing for separation and engaging in low-impact canine related exercise, qualified dog industry professionals could offer targeted activities for women with breast cancer, either independently or in conjunction with the volunteer sector or HPs as part of a support group. Offering a support group where women are invited to attend with their dogs (Trigg,

2021) provides an opportunity to engage women in wellbeing activities or discussions, with the dog becoming the conduit of conversation (Wood *et al.*, 2015), the goal being to facilitate easier communication and promote a sense of comfort and relaxation among participants. Having professionals from both the canine industry and healthcare present, provides opportunities to address any cancer-related concerns which may affect dog-guardianship (Currin-McCulloch *et al.*, 2023), such as managing exercise requirements of the dog whilst recovering from axillary surgery or coping with stress without it impacting upon the relationship with the dog.

Additional support group activities might include establishing a dog walking group specifically for women living with breast cancer, harnessing the positive effects of physical activity as well as exploiting the advantage of dogs as social conduits, or organising a course or workshop to teach women canine massage techniques, a way to promote the release of beneficial oxytocin in both themselves, and their dogs through tactile interaction (Morrison, 2016). Moreover, yoga, recognised for its benefits for individuals with breast cancer (Cramer *et al.*, 2017), could be provided as an activity for women to attend with their dogs, offering a social experience, gentle relaxation, and another opportunity for tactile engagement.

Considering the potential for involvement of canine professionals in these activities, it is recommended cancer awareness training be provided to those in the canine industries, to enable them to develop appropriate resources and understanding to provide suitable support for their customers who may be experiencing cancer and attending their classes, employing their services or expressing interest in participating in any of the aforementioned initiatives.

9.3 Relevance and recommendations - voluntary care and social prescribers

Social prescribing is a novel approach involving recommendations of activities, engagements, or services tailored to address some or all of an individual's unmet needs (Lee *et al.*, 2023). Social prescribers are typically employed within primary care settings, often affiliated with a GP surgery or clinical commissioning group. A social prescriber's main responsibility is to signpost individuals to support services and financial help, making them a hub of information about volunteer services and community groups (Tierney *et al.*, 2020). Furthermore, they may also take on the direct organisation of certain wellbeing activities including wellness walks. Social prescribers or independent walking groups leaders could partner with local canine professionals in the development of a walk targeted at dog guardians with breast cancer (Ingram and Cohen-Filipic, 2018), offering an opportunity to “talk

and walk”, with the potential to culminate in a social gathering or meeting of the support group at a nearby cafe.

Additionally social prescribers could assist in the creation and dissemination of resources to support dog guardians with cancer; this could include information about gaining support with veterinary care expenses, cost of pet food, arranging care for the dog whilst hospitalised, or services such as, The Cinnamon Trust, (2019) who offer practical assistance for the chronically ill, fostering their pets and ensuring long-term support for bereaved animals, all challenges which may arise during the cancer trajectory or come to the foreground as part of the worry associated with FOR.

9.4 Further study and development

Prior studies have explored the relationship between dog guardianship and its impact on emotional wellbeing and stress levels in the context the cancer experience (Ingram and Cohen-Filipic, 2018; Kogan *et al.*, 2023; Trigg, 2021); however, to the best of the researcher's knowledge, this study represents the first attempt at conducting a comprehensive narrative analysis, of the lived experiences of female dog owners who are breast cancer survivors.

It is recognised, by virtue of the small number of cases incorporated in the research and the subjective nature of the study, that the findings are not representative of all women breast cancer survivors who are dog guardians. Instead, they provide a glimpse into the lives of the participants and offer potential insights into the supportive role pet dogs can play for women facing similar circumstances. It is recommended further narrative enquiries be undertaken with a more expansive cohort; this may yield further insights into coping mechanisms which could be leveraged for the wellbeing of women. Targeted investigations could explore whether dog-guardianship fosters distinct coping strategies across a variety of demographic factors, including cancer-related variables (e.g., time since diagnosis, stage of disease), individual attributes (e.g., age, gender, marital status), and canine-specific variables (e.g., age, breed, time since acquisition).

Furthermore, a longitudinal study may provide greater insight into the fluctuating nature of the relationship between a woman and her dog across the duration of the disease, such a study could assist in the identification of whether there exists a distinct period during which the dog-human relationship holds more relevance or encounters particular challenges. This knowledge could facilitate tailored provision of resources and support, potentially from professionals within the canine industries to be targeted at critical junctures to preserve and enhance the dog-guardian bond throughout the cancer trajectory.

Previous research has identified benefits of permitting dogs in hospital and oncology care settings, including a reduction in distress, worry, pain and fatigue (Orlandi *et al.*, 2007; Fleishman *et al.*, 2015; Chubak *et al.*, 2017; Osório and Silva, 2017), whilst it is acknowledged feasibility may be limited in certain areas due to the risk of zoonotic infections in the immunocompromised and other practicalities, the researcher still contends this is an area warranting further exploration. The women derived multiple benefits from the companionship of their dogs during the challenging circumstances encountered throughout their cancer journey, many of which it is possible may translate to an oncology context.

Whilst all recommendations proposed in the preceding section would necessitate feasibility assessments to evaluate their acceptance, effectiveness in achieving desired outcomes, and cost implications prior to implementation, each proposition is considered potentially viable, consequently, each recommended action, should they be adopted, merits consideration as an evaluation project. The evaluation process should not only encompass the fundamental feasibility components, but also assess any impact upon the coping ability of the women experiencing the intervention, the perspective of the professionals involved, and an often-overlooked aspect in comparable studies, the impact on the wellbeing of the dog. This is particularly relevant where pet dogs may be introduced into unfamiliar settings or interact with other people or dogs outside their usual social circle as part of an intervention, such as may occur should dogs be permitted into support groups or care environments.

It is essential to remember dogs are sentient beings (Pulina, 2023), as such they should be able to opt out of any activities they could find stressful, therefore should any of the recommendations be implemented, it may be prudent to provide women considering attending a group session with their dog with a short education programme which will equip them with the ability to discern signs of stress in their dogs, and assess in advance of attending whether their canine companions are suited to group activities. Placing either the dog or the potentially distressed woman in a stressful situation would yield no benefit to either party.

The establishment of a support group for women to attend with their dogs presents a variety of opportunities for further investigation. A comparative study comparing the experiences of participants attending a group with their dogs to those without, may provide further insights into whether the perceived advantages of canine companionship in such settings are indeed realised. Additionally, it would be pertinent to ascertain whether any benefits derived from the presence of a dog extend to participants who attend a dog friendly group but do not themselves bring a dog, or if

they are solely experienced by the attendant dog guardian. A similar impact assessment could be undertaken in relation to a dog-related walking group or exercise class.

The role of dogs as social lubricants within the context of cancer is an area in which there appears to be a paucity of research. The introduction of a simple question into the assessment process enables healthcare professionals not only to gather information regarding potential dog related factors which may influence an individual's treatment, recovery, or hospitalisation but also presents an opportunity for multiple studies to assess whether identifying and addressing these factors contributes to an enhanced quality of life for women affected by breast cancer. Furthermore, a qualitative investigation aimed at exploring the emotional impact of offering women an opportunity to engage in discussions about their dogs, may yield further insights into the potential utility of the social facilitation factor for both those with cancer and healthcare professionals.

As distraction emerges as a prominent function of dogs, particularly in the context of understanding the therapeutic effects and theoretical basis of coping mechanisms experienced by dog guardians (Holder *et al.*, 2020), as well as in the realm of AAI's (Beetz, 2017), it would be pertinent to further investigate this phenomenon. Holder and colleagues, (2020) hypothesised the novelty element of the dogs in the context of AAI's accounted for the distraction experienced, whilst novelty may have contributed to the distraction provided by the women's dogs; as there was some comment about their dogs being sources of amusement, it is suggested there exists additional, yet undetermined factors that may have influenced the distraction provided by the dogs in the current study. These may, as postulated in the discussion, relate to a spectrum of sensory effects, which have not been fully appreciated in the context of AAI's, or they may involve additional factors, currently unknown. A comprehensive examination of the types of dog related distraction, employed by the women, informed by their perceptions of the dog's role as a distractor, may not only enhance understanding of the dog's potential contribution, but also provide valuable insight into the optimisation of the effectiveness of AAI's.

Given distraction has been identified as a frequently adopted strategy for mitigation of rumination (Nolen-Hoeksema *et al.*, 2008), and potentially moderation of worry surrounding fear of recurrence, this offers multiple opportunities for exploration of the mechanisms associated with dogs as distractors within this context, particularly in relation to nocturnal fear of recurrence, a time when individuals often find themselves alone with intrusive thoughts. Additionally, as it has been identified HPs frequently find discussion about FOR particularly challenging, therefore are reluctant to initiate such discussions (Liu, Butow, *et al.*, 2019); the role of the dog as a social lubricant in such situations, it is suggested, be investigated. Within the current study the focus upon dogs, although not directly

involved in the interaction between the researcher and participants, certainly appeared to make it easier for individuals to share their fears and concerns.

The field of haptics is gaining increasing attention as a relatively new area of interest that may offer the potential to evoke neurophysiological and neurobiological responses similar to those elicited during interactions between humans and animals, via artificial, robotic tactile devices (Jewitt *et al.*, 2021). Whilst it is plausible neurobiological effects particularly oxytocin release may occur in response to tactile interaction with synthetic fur used in haptic devices (Flagg *et al.*, 2012), mirroring the effects observed with contact with a dog (Odendaal and Meintjes, 2003), or cat (Johnson *et al.*, 2021), this assertion remains to be definitively established. Although the neurobiological aspects are acknowledged to lie beyond the primary scope of the present study, the impact of engagement with faux fur and the advantages it may confer warrants further investigation. It is therefore strongly advocated, a randomised clinical trial (the gold standard within robust clinical research paradigms) to refute or confirm this theory be conducted by the scientific community in the near future.

Conducting an initial quantitative, option-based self-reported study would be valuable to ascertain whether there are any psychological benefits derived from tactile interaction with faux fur, by women attending a breast or oncology clinic, additionally, assessing any associated impact on the oxytocin levels of the participants would provide further insights into this phenomenon. Although it is acknowledged accurate measurement of oxytocin levels presents clinical challenges (MacLean *et al.*, 2019) necessitating sophisticated laboratory facilities which may not be readily available. Furthermore, full understanding of the implications of oxytocin release in women with breast cancer remains an area of ongoing scientific enquiry (Liu *et al.*, 2020), therefore it is recognised multiple variables may potentially hinder the feasibility of this proposal.

Hence there exists many areas for further exploration into the multifaceted aspects of dog guardianship in the context of breast cancer. These include investigations into the neurobiological effects, distraction mechanisms, the role of companionship and support in various settings, as well as the function of the dog as a social facilitator. By pursuing these lines of enquiry, it is anticipated a greater understanding of the complex relationship between women and their dogs, and the implications to their wellbeing in respect of breast cancer may be developed, ultimately leading to improved care and support for all women facing the challenges of breast cancer, as well as those in the wider cancer community.

10 Conclusion

This research has thoroughly examined the role and perceived benefits of companion canines in the lived experience of women with breast cancer, hence this final chapter will provide a synopsis and synthesis of the primary conclusions, provide a summation of the study and provide direction for further exploration of related concepts.

The increase in breast cancer survivorship and gradual shift in focus to encompass not only survival in chronological terms but also in regard to quality of life (Arnold *et al.*, 2022), has led to the recognition cancer related distress is linked to the extent and nature of unmet needs the woman with breast cancer is experiencing (Şengün İnan *et al.*, 2023). Following on from this, focus has been on establishing the nature of unmet needs and suggestions for sub populations which may enable them to address their unmet needs (Markovitz *et al.*, 2015), this has led to the creation of a range of programmes targeted at meeting the unfulfilled needs of those various sub-populations, these have often been costly, resource intensive and of varying success (Zabora *et al.*, 2001; Fallowfield and Jenkins, 2014; Dekker *et al.*, 2020; van Maaren *et al.*, 2024).

Consequently, a more bespoke, individual holistic approach is required (Fallowfield *et al.*, 2021). Therefore, currently in the UK, all cancer patients are offered a holistic needs assessment (Grassi and Watson, 2024), which may encompass a distress thermometer evaluation (Holland and Bultz, 2007), concerns checklist and symptom assessment (Stapleton *et al.*, 2016). Whilst this is a step forward and the provision of psycho-oncology has significantly improved over the last decade in response to the IPOS statement (Holland and Bultz, 2007; Holland *et al.*, 2011; Bultz, 2016), it should be acknowledged based upon the current model of NICE, (2004), adopted nationally a large proportion of women who are at risk of experiencing cancer related distress are potentially being relied upon to source their own networks of support (Transforming Cancer Services Team, 2020); however, at the same time it is recognised some women will not be in a position to engender support from those around her or will not find the type of support offered helpful (Fong *et al.*, 2017).

Whilst it is appreciated dog guardians are a specific subpopulation of women with breast cancer, the study demonstrates the women's dogs played a significant role in their lives and survivorship, suggesting this may be the same for other women contending with breast cancer. The research has illustrated that whilst the term "distraction" may refer to the coping mechanisms elucidated from the narrative analyses, its meaning is different for every participant and may be viewed as an individual construct dependent upon the guardian, dog, and the individual's context; it is also fluid and

constantly changing (Barraclough, 1999). However, providing distraction especially during times when FOR is at the fore-front of any thoughts (Mehnert *et al.*, 2009), or when the women were on their own, particularly at night was invaluable (Curran *et al.*, 2017), coupled with ability of the dogs to be able to support in other ways, such as being non-judgemental listeners (Kurdek, 2009; Carlini, 2016; Evans-Wilday *et al.*, 2018) or a facilitator of social engagement (Wood *et al.*, 2015), especially during the loneliness of not only the disease but also the pandemic, positioned the dogs as being a valuable addition to the social support of the women (Bowen *et al.*, 2021). This enhanced coping facilitated by the dogs, mainly through distraction and mutual activities, may have contributed to the oxytocin experienced (Handlin *et al.*, 2012), initiating a biochemical effect, which could have strengthened the bond and relationship between the dog and guardian (Churchland and Winkielman, 2012), and may have also stimulated the release other neurochemicals thereby fostering a greater sense of wellbeing (Dsouza *et al.*, 2020).

Whether dogs responded to the emotions or licked tears away because they were salty is inconsequential; it is the perception the dogs contributed to the greater sense of emotional wellbeing that is of significance, a placebo effect may be just as beneficial. Whether this resulted in a reduction in cancer related distress in empirical terms is not known, nor the impact upon wellbeing quantified as the study did not attract sufficient a response for evaluation of this nature. The women, however, perceived the dogs as being instrumental in the reduction of their distress and increase in their wellbeing, and as Herzog, (2011) posits, the perception pets (dogs) have positive impact is the therapeutic aspect of the interaction.

It is clear it would be advantageous for HPs to become more aware of the role dogs may assume in the maintenance of wellbeing and survivorship of women with breast cancer. Therefore, aligned with the pragmatic approach leading to societal benefit (Kelly and Cordeiro, 2020), it is hoped the stories contained within this thesis will be shared to facilitate learning and educate others about the vital role pet dogs play in the wellbeing of those with cancer, and the importance of helping women maintain and enhance the relationship, as well as stimulating further research. HPs can help maintain this bond by recognising the role dogs assume in the wellbeing of these women through the development of sensitive questioning, for example they could ask one simple question “do you have any pets at home which rely on you for daily care or support”, picking up cues (Butow *et al.*, 2002), thoughtful engagement, and through working with those in the canine industries to develop strategies which “exploit” the relationship for the benefit of both the women and dog, such as canine massage, dog parkour, scent work, yoga (Cramer *et al.*, 2017) or a walking group (Ingram and Cohen-Filipic, 2018).

This may go some way to alleviating the distress so many women experience at some point during their disease trajectory, thought to be as many as sixty two percent of all women with breast cancer (Sun *et al.*, 2022), thereby reducing the burden not only on them but also on limited psychological services available.

Whilst it should be remembered the researcher is not recommending women with breast cancer acquire a dog for this purpose, and the existing bond between the dog and guardian helps facilitate this coping enhancement, it does position dogs as a valuable form of complementary support (Cohen, 2002). It should also be noted dogs are sentient creatures (Crump *et al.*, 2022), as such should be afforded choice as to whether they want to engage at this level (Glenk and Foltin, 2021). The women in the study certainly appeared to offer their dogs unconditional love and regarded them as partners rather than assistants or providing a service. Dogs are generally social animals (Kirk *et al.*, 2019), these being no exception, they offered companionship, proximity and an opportunity for tactile engagement which was one element the women particularly appeared to value (Beetz, 2017), and an area which would benefit from further exploration, especially around the potential benefits of engaging with synthetic fur (Müller *et al.*, 2015; Johnson *et al.*, 2021). The researcher, therefore, calls upon the scientific community to further the research in this area, and to establish if a link between carcinoma of the breast and oxytocin exists.

This research builds upon the studies of Ingram and Cohen-Filipic, (2018); Trigg, (2021), Kogan and colleagues., (2023); Currin-McCulloch and colleagues, (2023). Although this was a small-scale exploratory study, producing results not generalisable, it does offer validation to other women with close relationships with their dogs, that this is a relationship to be valued by professionals, nurtured and maintained, because not only does it aid the individual but may also help to facilitate better communication between woman and HP through the dog's role as a social conduit (Wood *et al.*, 2015). Hence, recommendations of simple yet potentially impactful methods could enhance the quality of life for women with breast cancer, whilst further strengthening the women's coping mechanisms. The researcher therefore calls upon a combined approach from the fields of oncology, anthrozoology and psychology to come together to further develop and implement these strategies.

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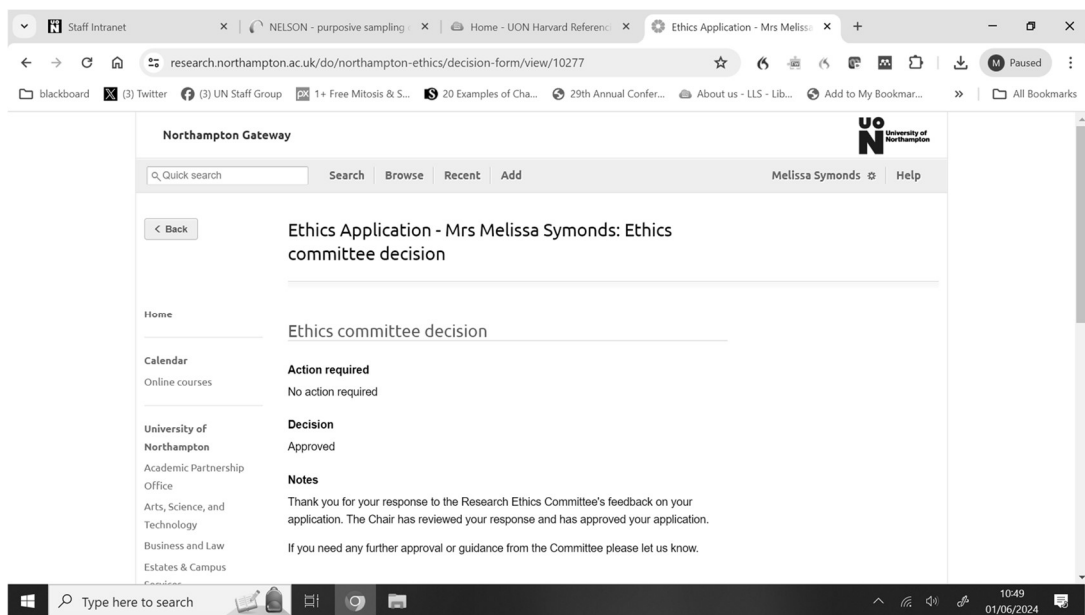
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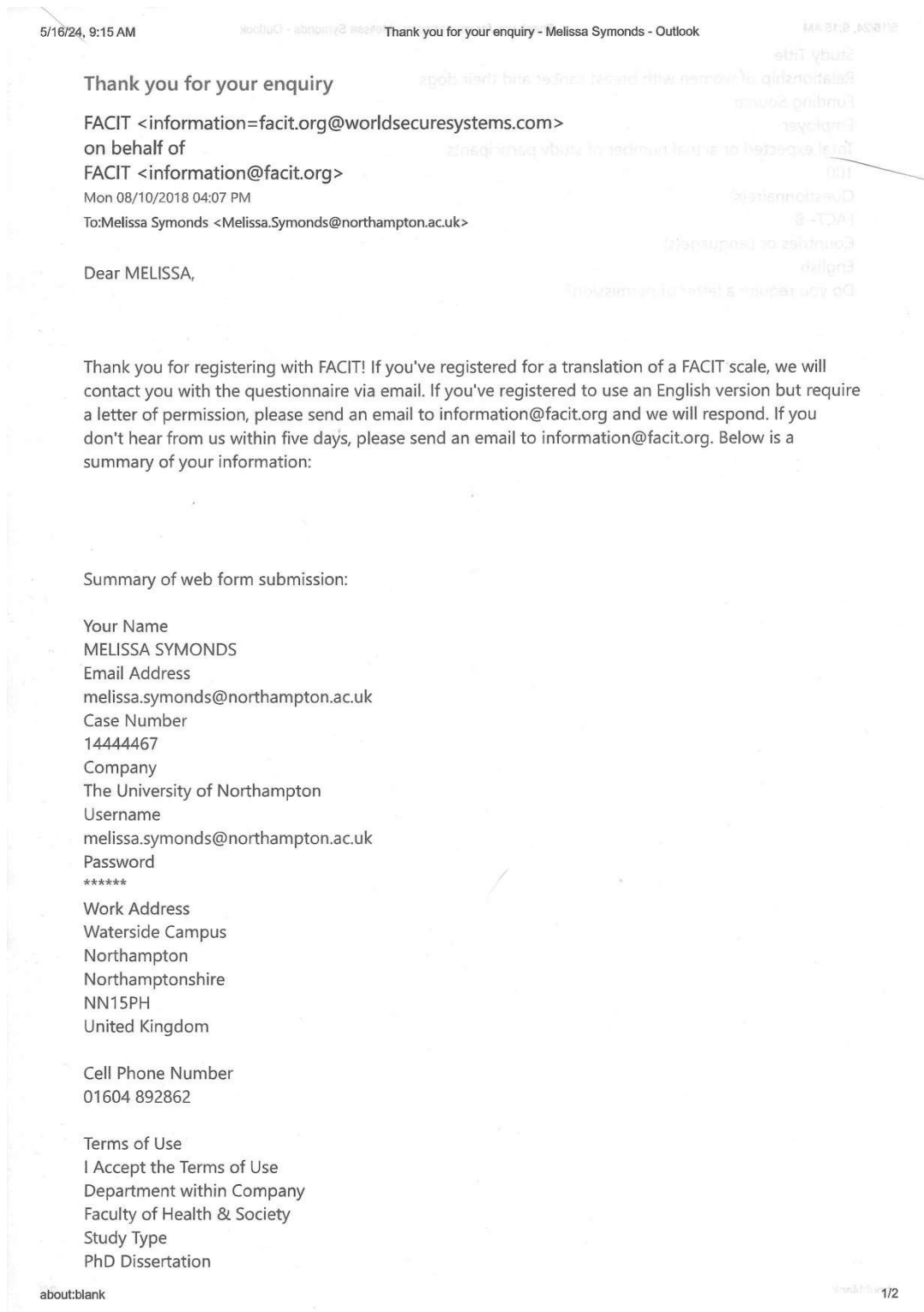
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12 Appendices

Appendix 1 Ethical Approval Document



Appendix 2 Permission to use FACT-B within the data collection



5/16/24, 9:15 AM

Thank you for your enquiry - Melissa Symonds - Outlook

5/16/24, 9:15 AM

Study Title
Relationship of women with breast cancer and their dogs
Funding Source
Employer
Total expected or actual number of study participants
100
Questionnaire(s)
FACT- B
Countries or Language(s)
English
Do you require a letter of permission?

Thank you for registering with FACT! If you've registered for a translation of a FACT scale, we will contact you with the questionnaire via email. If you've registered to use an English version but require a letter of permission, please send an email to information@fact.org and we will respond. If you don't hear from us within five days, please send an email to information@fact.org. Below is a summary of your information:

Summary of web form submission

Your Name
MELISSA SYMONDS
Email Address
melissa.symonds@northampton.ac.uk
Case Number
1444457
Company
The University of Northampton
Username
melissa.symonds@northampton.ac.uk
Password

Work Address
Watney Campus
Northampton
Northamptonshire
NN1 5BH
United Kingdom
Cell Phone Number
01604 892662

Terms of Use
I accept the Terms of Use
Department within Company
Faculty of Health & Society
Study Type
PhD Dissertation

about:blank

2/2 about:blank

Appendix 3 Participation information for Phase I

Incorporated within the electronic questionnaire with institution logo

Hello

My name is Melissa Symonds, I am a PhD student based in the Psychology Department at the University of Northampton. I currently work in nurse and allied health professional's undergraduate and post graduate education provision. I have a background in oncology and radiotherapy having worked as a therapeutic radiographer, and an interest (due to also being a dog trainer) in human – dog interaction.

I am conducting this study which will explore the relationship between women living with breast cancer and their dogs and would like to invite you to participate.

This sheet provides information about the study and what participation will involve. I hope it answers any questions you may have but if you do have any further questions please do contact me
melissa.symonds@northampton.ac.uk

Participant Information Sheet – Online survey

Thank you for considering taking part in this study.

Before you decide whether you wish to participate it is important you understand why the study is taking place and what it will involve. Please take time to read through the following frequently asked questions below, and please do not hesitate to contact me if there is anything else you would like to know.

What is the purpose of the study?

I am interested in finding out about the rapport you have with your dog and your wellbeing in relationship to your living with breast cancer. Your insights will be used to help professionals like the ones who may be caring for you understand about the bond women with breast cancer have with their dogs, and the role your dogs have in your life.

What will I have to do if I agree to take part?

You will be invited to complete a short survey, this is all online, anonymous (although you may leave your contact details if you would like to participate further in the study) and should take no longer than 10 minutes of your time. You are free to ask any questions about the study before commencing, during and after the study.

Will my participation remain confidential?

Your responses will be downloaded and stored securely, whilst we will be asking you to provide some background details for example age, time since diagnosis etc we will not be taking any identifying information (unless you would like to participate further in the study, this is entirely optional).

You can withdraw from the study at any point during the online completion by simply closing the browser. Please note you cannot save your answers to return to them later.

If you have opted to leave contact information and consent to further participation in the study, and subsequently change your mind, you may withdraw this consent to be contacted, at any time.

All data gathered will be kept for 5 years to allow for reports to be written and any potential publication. The data will be stored securely during this time and then destroyed appropriately.

Do I have to take part?

The research is completely voluntary. If you do not want to participate, that is okay, you have the right not to participate. You can also stop at any time if you do not want to finish the study.

What will happen to the results of the survey?

Anonymous data from this study will be used to inform the writing of my PhD thesis and subsequent publication of the thesis and associated reports.

Who has reviewed the study?

This research has been approved by the Research Degrees Ethics Committee of The University of Northampton

How do I take part?

If you would like to take part in the research simply click “next”. By completing the survey, you are consenting to taking part in the research. However, we also ask that you “tick” a consent statement.

If you decide you would no longer take part in the research, you are free to withdraw at any point during the survey without providing a reason by simply closing the browser. Your data will not be stored. Please note you will be unable to withdraw after submission of the survey unless contact details have been submitted.

Contact for further information

If you have any questions relating to this study, please do not hesitate to contact me, Melissa Symonds, email melissa.symonds@northampton.ac.uk

If you have any concerns about this research, please contact my PhD supervisor/s Dr Federico Farini Federico.farini@northampton.ac.uk or Dr Roz Collings roz.collings@northampton.ac.uk

Appendix 4 Consent form for Phase I

Incorporated into the electronic questionnaire

Consent form

Please read each statement and then confirm that you agree or disagree with each of the statements, before continuing to the next section.

I confirm that I have read and understand the information provided for this current study. [Required]

Yes

No

I confirm I have had the opportunity to consider the information, ask questions and have these answered satisfactorily. [Required]

Yes

No

I understand that my involvement is voluntary and that I am free to withdraw at any time during completion of the survey [Required]

Yes

No

I understand that my data is anonymous and therefore I will be unable to withdraw upon submission of my responses [Required]

Yes

No

I understand that any identifying information I disclose will remain confidential and that it will be destroyed at the end of the project.[Required]

Yes

No

I agree to take part in this research [Required]

Yes

No

Appendix 5 Questionnaire

Formatted for illustrative purposes only.

Women with breast cancer's relationship with their dogs.

* Indicates required question

Consent form

Please read each statement and then confirm that you agree or disagree with each of the statements, before continuing to the next section.

1. I confirm that I have read and understand the information provided for this current study *

Mark only one oval.

☐ Yes ☐ No

2. I confirm I have had the opportunity to consider the information, ask questions and have these answered satisfactorily. *

Mark only one oval.

☐ Yes ☐ No

3. I understand that my involvement is voluntary and that I am free to withdraw and any time during completion of the survey. *

Mark only one oval.

☐ Yes ☐ No

4. I understand that my data is anonymous and therefore I will be unable to withdraw upon submission of my responses. *

Mark only one oval.

☐ Yes ☐ No

5. I understand that any identifying information I disclose will remain confidential and that it will be destroyed at the end of the project. *

Mark only one oval.

☐ Yes ☐ No

6. I agree to take part in this research. *

Mark only one oval.

☐ Yes ☐ No

About you

7. Age

Please enter your age in numerical format

8. Marital status

Mark only one oval.

- ☐ Living in a couple: Married or civil partnered
- ☐ Living in a couple / Cohabiting - never married or civil partnered
- ☐ Living in a couple / Cohabiting- previously married or civil partnered
- ☐ Not living in a couple: - never married or civil partnered
- ☐ Not living in a couple: -previously married or civil partnered

9. In what year did you receive a breast cancer diagnosis?

10. Please indicate, if known the stage of breast cancer

Mark only one oval.

- ☐ Stage 1
- ☐ Stage 2
- ☐ Stage 3
- ☐ Stage 4

11. Are you currently receiving any of the following cancer treatments?

Check all that apply

☐ chemotherapy including targeted therapy / immunotherapy / hormone therapy

☐ radiotherapy

☐ other

12. Do you live in the UK? -please note you do not have to live in UK to take part in *
this research

Mark only one oval.

☐ Yes ☐ No

13. If living in the UK, please indicate which region you live in

Mark only one oval.

☐ The North East - County Durham, Darlington, Hartlepool, Middlesbrough, Northumberland, Redcar and Cleveland, Stockton-on-Tees, Tyne and Wear.

☐ Yorkshire and the Humber - East Riding of Yorkshire, South Yorkshire, West Yorkshire, Lincolnshire (part), North Yorkshire.

☐ East Midlands – Derbyshire, Staffordshire, Leicestershire, Rutland, Northamptonshire, Nottinghamshire, Lincolnshire (part).

☐ East of England - Norfolk, Suffolk, Cambridgeshire.

☐ London

☐ South East - Berkshire, Buckinghamshire, East Sussex, Hampshire, the Isle of Wight, Kent, Oxfordshire, Surrey, West Sussex.

☐ West Midlands – Herefordshire, Shropshire, Staffordshire, Stoke-on-Trent, Telford and Wrekin, Warwickshire, Worcestershire.

☐ Scotland

☐ Wales

☐ N.Ireland

14. Do you own a dog? *

Mark only one oval.

☐ Yes ☐ No

15. How many dogs do you have? *

Mark only one oval.

☐ 1

☐ 2

☐ 3

☐ 4

☐ 5

☐ more than 5

Your dog

In this section you will be asked a number of questions about your relationship with your dog / one of your dogs.

If you have more than one dog for ease please answer the following questions in relation to your favourite dog or the dog with whom you have the closest relationship.

16. How many years have you had your dog?

17. What breed is your dog?

18. What age (if known) is your dog?

19. How hard is it to look after your dog?

Mark only one oval.

- ☐ very easy
- ☐ easy
- ☐ neither hard nor easy
- ☐ hard
- ☐ very hard

20. How often do you kiss your dog?

Mark only one oval.

- ☐ never
- ☐ once a month
- ☐ once a week
- ☐ once every few days
- ☐ at least once a day

21. I wish my dog and I never had to be apart.

Mark only one oval.

- ☐ strongly disagree
- ☐ disagree
- ☐ neither agree or disagree
- ☐ agree
- ☐ strongly agree

22. My dog makes too much mess

Mark only one oval.

- ☐ strongly disagree
- ☐ disagree
- ☐ neither agree or disagree
- ☐ agree
- ☐ strongly agree

23. How often do you play games with your dog?

Mark only one oval.

- ☐ never
- ☐ once a month
- ☐ once a week
- ☐ once every few days
- ☐ at least once a day

24. It bothers me that my dog stops me from doing things I enjoyed before I owned it.

Mark only one oval.

- ☐ strongly disagree
- ☐ disagree
- ☐ neither agree or disagree
- ☐ agree
- ☐ strongly agree

25. How often do you take your dog to visit people?

Mark only one oval.

- ☐ never
- ☐ few times a year
- ☐ once a month
- ☐ once a fortnight
- ☐ once a week

26. It is annoying that I sometimes have to change my plans because of my dog.

Mark only one oval.

- ☐ strongly disagree
- ☐ disagree
- ☐ neither agree or disagree
- ☐ agree
- ☐ strongly agree

27. My dog costs too much money

Mark only one oval.

- ☐ strongly disagree
- ☐ disagree
- ☐ neither agree or disagree
- ☐ agree
- ☐ strongly agree

28. How often do you buy your dog presents?

Mark only one oval.

- ☐ never
- ☐ few times a year
- ☐ once a month
- ☐ once a fortnight
- ☐ once a week

29. My dog is constantly attentive to me.

Mark only one oval.

- ☐ strongly disagree
- ☐ disagree
- ☐ neither agree or disagree
- ☐ agree
- ☐ strongly agree

30. How often do you give your dog food treats?

Mark only one oval.

- ☐ never
- ☐ once a month
- ☐ once a week
- ☐ once every few days
- ☐ at least once a day

31. How often do you tell your dog things you don't tell anyone else?

Mark only one oval.

- ☐ never
- ☐ once a month
- ☐ once a week
- ☐ once every few days
- ☐ at least once a day

32. How often do you feel that looking after your dog is a chore?

Mark only one oval.

- ☐ never
- ☐ once a month
- ☐ once a week
- ☐ once every few days
- ☐ at least once a day

33. How often does your dog stop you from doing things you want to?

Mark only one oval.

- ☐ never
- ☐ once a year
- ☐ once a month
- ☐ once a week
- ☐ once a day

34. I would like to have my dog near me all the time.

Mark only one oval.

- ☐ strongly disagree
- ☐ disagree
- ☐ neither agree or disagree
- ☐ agree
- ☐ strongly agree

35. How often do you groom your dog?

Mark only one oval.

- ☐ never
- ☐ once a month
- ☐ once a week
- ☐ once every few days
- ☐ at least once a day

36. If everyone else left me my dog would still be there for me.

Mark only one oval.

- ☐ strongly disagree
- ☐ disagree
- ☐ neither agree or disagree
- ☐ agree
- ☐ strongly agree

37. How often do you feel that having a dog is more trouble than it is worth?

Mark only one oval.

- ☐ never
- ☐ once a month
- ☐ once a week
- ☐ once every few days
- ☐ once a day

38. My dog helps me get through tough times.

Mark only one oval.

- ☐ strongly disagree
- ☐ disagree
- ☐ neither agree or disagree
- ☐ agree
- ☐ strongly agree

39. How often do you hug your dog?

Mark only one oval.

- ☐ never
- ☐ once a month
- ☐ once a week
- ☐ once every few days
- ☐ at least once a day

40. My dog provides me with constant companionship.

Mark only one oval.

- ☐ strongly disagree
- ☐ disagree
- ☐ neither agree or disagree
- ☐ agree
- ☐ strongly agree

41. How often do you have your dog with you while relaxing, i.e. watching TV?

Mark only one oval.

- ☐ never
- ☐ once a month
- ☐ once a week
- ☐ once every few days
- ☐ at least once a day

42. My dog is there whenever I need to be comforted.

Mark only one oval.

- ☐ strongly disagree
- ☐ disagree
- ☐ neither agree or disagree
- ☐ agree
- ☐ strongly agree

43. How traumatic do you think it will be for you when your dog dies?

Mark only one oval.

- ☐ not traumatic at all
- ☐ not traumatic
- ☐ neither traumatic nor not traumatic
- ☐ traumatic
- ☐ very traumatic

Adapted from the Monash Dog Owners Relationship Scale (Dwyer *et al*, 2006)

Living with breast cancer

In this section you will be asked a number of questions about your experiences of living with breast cancer.

Below is a list of statements that other people with your illness have said are important.

Please indicate which response is most appropriate to your situation, as it applies to the past 7 days.

(This scale is known as the FACT-B scale it, has been employed in many published studies in the UK and abroad)

Copyright information and reference to scale was included at the end of FACT-B questions.

Appendix 6 Signposting information

It is not anticipated that our discussion should be in any way upsetting but should you be affected by anything we talk about, these are some organisations you may like to contact for support.

Macmillan Cancer Support

National charity that provides free support and guidance to those with or caring for people with cancer.

Tel 0808 808 0000

<https://www.macmillan.org.uk/>

Breast Cancer Care

The only UK wide charity providing care, information and support to people affected by breast cancer.

Tel 0808 800 6000

<https://www.breastcancercare.org.uk/>

Breast Cancer Now

National charity dedicated to fighting breast cancer through research & awareness.

Tel 0333 20 70 300

<https://breastcancernow.org/>

Breast Cancer Care and Breast Cancer Now will be merging to form a new charity during 2019.

Breast Cancer Haven

Provides, completely free of charge, a wide range of therapies which help people to deal with the physical and emotional side effects of breast cancer.

Tel 020 7384 0099

<https://www.breastcancerhaven.org.uk>

Your local support groups, general practitioner or oncology department will also be able to signpost you to additional regional support.

Appendix 7 University press release



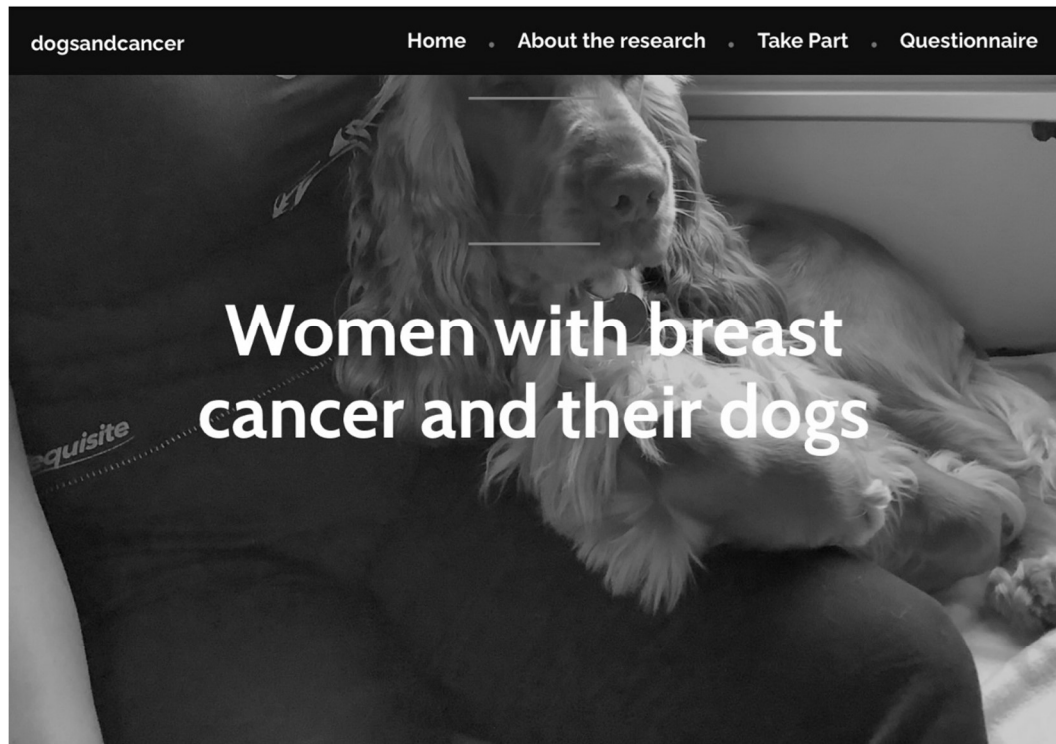
The relationship between women who have experienced breast cancer and their dogs and whether this positively impacts on their health forms new University of Northampton research.

Melissa Symonds, Senior Lecturer in Oncology is conducting the research for her PhD and is looking for women in the local region and UK wide to lend their views in an online survey.

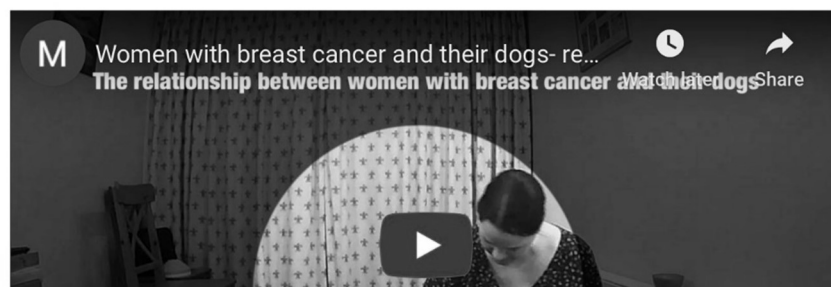
Melissa's aim is to take their responses to help inform healthcare professionals about the important role dogs play in the lives of women with breast cancer so that they can help support the bond women (with breast cancer) have with their four-legged friends.*



Appendix 8 Screenshots from website and Facebook page



*A study investigating the relationship
between women with breast cancer
and their dogs*



The questionnaire...

The research involves completion of a short questionnaire. The survey is online and takes around 20 minutes to complete. The questions cover the physical, emotional and social impact of having breast



cancer and asks about the relationship you have with dogs, such as the practicalities of looking after them, how attentive and messy you may feel your dog is, the emotional bond between you and your dog, and how you feel your dog impacts on your life.

My aim is to help inform healthcare professionals about the important role dogs play in the lives of women living with breast cancer, so that they can help support the bond women (with breast cancer) have with their canine friends.

To access the questionnaire please click on the link below

<https://northampton.onlinesurveys.ac.uk/breast-cancer-and-dogs>

Please see below for further information about participation.

 Privacy ...



Breast Cancer and Dogs - a research project

Posts

About

Photos

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1 share



Like



Comment



Share

Breast Cancer and Dogs - a research project



12 Jan 2021 · 🌐

Please share this Facebook page and or the web address.
Many thanks



dogsandcancer.wordpress.com

dogsandcancer

See insights and ads

Boost post

6 shares



Like



Comment



Share

Breast Cancer and Dogs - a research project updated their profile picture.



8 Jan 2021 · 🌐



Home



Video



Notifications



Menu

Appendix 9 Modified MDORS scoring criteria

Modified MDORS, adapted from (Dwyer *et al.*, 2006; Howell *et al.*, 2017)

Instructions

In relation to your favourite dog or the dog with whom you have the closest relationship.

Please answer the following questions, indicating your answer below.

****Note**

Numbers corresponding to answers were not displayed on the questionnaire, nor were the categories (DOI, EC, PC) of the question.

Questions

1) How hard is it to look after your dog? (PC)

1 = very easy, 2 = easy, 3 = neither hard nor easy, 4 = hard; 5 = very hard

2) How often do you kiss your dog? (DOI)

1 = never, 2 = once a month, 3 = once a week, 4 = once every few days, 5 = at least once a day

3) I wish my dog and I never had to be apart. (EC)

1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

4) My dog makes too much mess. (PC)

1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

5) How often do you play games with your dog? (DOI)

1 = never, 2 = once a month, 3 = once a week, 4 = once every few days, 5 = at least once a day

6) It bothers me that my dog stops me from doing things I enjoyed before I owned it. (PC)

1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

7) How often do you take your dog to visit people? (DOI)

1 = never, 2 = few times each year, 3 = once a month, 4 = once a fortnight, 5 = once a week

8) It is annoying that I sometimes have to change my plans because of my dog. (PC)

1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

9) My dog costs too much money. (PC)

1= strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

10) How often do you buy your dog presents? (DOI)

1 = never, 2 = few times each year, 3 = once a month, 4 = once a fortnight, 5 = once a week

11) My dog is constantly attentive to me. (EC)

1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

12) How often do you give your dog food treats? (DOI)

1 = never, 2 = once a month, 3 = once a week, 4 = once every few days, 5 = at least once a day

13) How often do you tell your dog things you don't tell anyone else? (EC)

1 = never, 2 = once a month, 3 = once a week, 4 = once every few days, 5=at least once a day

14) How often do you feel that looking after your dog is a chore? (PC)

1 = never, 2 = once a month; 3=once a week; 4=once every few days; 5 = at least once a day

15) How often does your dog stop you from doing things you want to? (PC)

1 = never, 2 = once a year, 3 = once a month, 4 = once a week, 5 = once a day

16) I would like to have my dog near me all the time. (EC)

1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

17) How often do you groom your dog? (DOI)

1 = never, 2 = once a month, 3 = once a week, 4 = once every few days, 5 = at least once a day

18) If everyone else left me my dog would still be there for me (EC)

1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

19) How often do you feel that having a dog is more trouble than it is worth? (PC)

1 = never, 2 = once a month; 3=once a week; 4=once every few days, 5=once a day

20) My dog helps me get through tough times. (EC)

1 = strongly agree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

21) How often do you hug your dog? (DOI)

1 = never, 2 = once a month, 3 = once a week, 4 = once every few days, 5 = at least once a day

22) My dog provides me with constant companionship. (EC)

1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

23) How often do you have your dog with you while relaxing, i.e. watching TV? (DOI)

1 = never, 2 = once a month, 3 = once a week, 4 = once every few days, 5 = at least once a day

24) My dog is there whenever I need to be comforted. (EC)

1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

25) How traumatic do you think it will be for you when your dog dies? (EC)

1 = not traumatic at all, 2 = not traumatic, 3 = neither traumatic nor not traumatic, 4 = traumatic, 5 = very traumatic

Scoring, add scores as indicated for each question, total each for each criteria EC, PC, DOI

DOI: Dog–Owner Interaction subscale.

EC: Perceived Emotional Closeness subscale.

PC: Perceived Costs subscale.

Divide DOI by 8 for average score for DOI

Divide EC by 9 for average score for EC

Divide PC by 8 for average score for PC

Dog–Owner Interaction 1 = less interaction ... 5 = great interaction

Emotional Closeness 1 = less emotional closeness ... 5 = strong emotional closeness

Perceived Costs 1 = high perceived cost ... 5 = low perceived cost

Total average score = (average DOI + average EC + average PC) / 3

1 = less positive relationship 5 = very positive relationship

Appendix 10 Results of phase I data collection

Pseudonym	DOI	PC	EC	PWB	SWB	EWB	FWB	BCS	FACT-G	FACT-B
Andrea	4.00	1.38	4.33	28.00	12.00	19.00	23.00	34.00	82.00	116.00
Barbara	3.50	1.38	4.56	22.00	24.00	13.20	14.00	25.00	73.20	98.20
Clare	4.75	1.13	5.00	23.00	5.00	8.00	22.00	24.00	58.00	82.00
Diane	4.38	1.88	3.89	23.00	21.00	13.00	16.00	14.00	73.00	87.00
Emma	4.00	1.75	4.78	21.00	15.00	15.00	21.00	13.00	72.00	85.00
Fay	3.25	2.13	4.00	15.00	10.00	14.00	11.00	19.00	50.00	69.00
Gina	4.13	1.63	4.33	24.00	21.00	21.00	24.00	21.00	90.00	111.00
Hania	4.75	1.13	5.00	20.00	22.00	24.00	26.00	29.00	92.00	121.00
India	4.25	1.25	4.89	23.00	5.83	22.00	19.00	35.00	69.83	104.83
Jasmine	4.00	1.38	3.22	15.00	19.00	21.00	23.00	20.00	78.00	98.00
Kylie	3.75	1.25	4.44	15.00	21.00	23.00	11.00	14.00	70.00	84.00
Lily	4.25	1.63	4.44	26.00	21.00	17.00	24.00	17.00	88.00	105.00
Maya	4.13	2.13	3.89	19.00	28.00	13.00	16.00	18.00	76.00	94.00
Naomi	3.00	2.00	4.78	13.00	22.00	16.00	17.00	16.60	68.00	84.60
Olivia	2.50	1.50	4.22	16.00	15.00	11.00	6.00	15.00	48.00	63.00
Patricia	4.13	1.88	4.56	27.00	15.00	21.00	22.00	26.00	85.00	111.00
Quinn	4.00	1.63	3.89	18.00	21.00	15.00	23.00	28.00	77.00	105.00
Rachel	4.25	2.00	3.67	16.00	5.00	13.00	14.00	14.00	36.00	50.00
Suzzane	4.63	1.13	4.67	28.00	16.00	15.00	24.00	28.00	83.00	111.00
Teagan	4.63	1.75	4.78	19.00	14.00	10.00	17.00	26.00	60.00	86.00
Uma	3.88	2.00	2.89	28.00	22.00	22.00	28.00	33.00	100.00	133.00
Valerie	3.63	2.38	4.11	7.00	11.00	13.00	11.00	12.00	42.00	54.00
Wendy	3.63	1.50	4.56	20.00	21.00	13.00	17.00	19.00	71.00	90.00
Xena	4.00	1.75	4.11	13.00	28.00	19.00	12.00	25.00	72.00	97.00
Yasmin	4.75	1.13	4.56	22.00	28.00	13.00	24.00	25.00	87.00	112.00
Zara	3.63	1.50	4.00	24.00	25.00	17.00	26.83	24.00	92.83	116.83
Zivah	4.25	1.50	5.00	10.00	18.00	9.00	10.50	21.00	47.50	68.50
average	4.00	1.62	4.32	19.81	17.99	15.93	18.60	22.06	71.90	93.96
max	4.75	2.38	5.00	28.00	28.00	24.00	28.00	35.00	100.00	133.00
min	2.50	1.13	2.89	7.00	5.00	8.00	6.00	12.00	36.00	50.00

Key

mMDORS

DOI	Dog–Owner Interaction subscale.
EC	Perceived Emotional Closeness subscale.
PC	Perceived Costs subscale.

FACT-B

PWB	Physical Well Being
SWB	Social Well Being
EWB	Emotional Well Being
FWB	Functional Well Being
BCS	Breast Cancer Scale
FACT-G	Functional Assessment of Cancer Therapy - General
FACT-B	Functional Assessment of Cancer Therapy - Breast

mMDORS Descriptives

		Statistic	Std. Error
Dog Owner Interaction (DOI)	Mean	4.00148	.103217
	95% Confidence Interval for Mean	Lower Bound	3.78932
		Upper Bound	4.21365
	5% Trimmed Mean	4.03611	
	Median	4.00000	
	Variance	.288	
	Std. Deviation	.536330	
	Minimum	2.500	
	Maximum	4.750	
	Range	2.250	
	Interquartile Range	.620	
	Skewness	-.872	.448
	Kurtosis	1.202	.872
Perceived Costs (PC)	Mean	1.61815	.067268
	95% Confidence Interval for Mean	Lower Bound	1.47988
		Upper Bound	1.75642
	5% Trimmed Mean	1.60654	
	Median	1.62500	
	Variance	.122	
	Std. Deviation	.349536	
	Minimum	1.130	
	Maximum	2.380	
	Range	1.250	
	Interquartile Range	.500	
	Skewness	.296	.448
	Kurtosis	-.718	.872
Emotional Closeness (EC)	Mean	4.31724	.101706
	95% Confidence Interval for Mean	Lower Bound	4.10818
		Upper Bound	4.52630
	5% Trimmed Mean	4.35385	
	Median	4.44000	
	Variance	.279	
	Std. Deviation	.528480	
	Minimum	2.890	
	Maximum	5.000	
	Range	2.110	
	Interquartile Range	.780	
	Skewness	-.921	.448
	Kurtosis	.860	.872

FACT(B) component descriptives

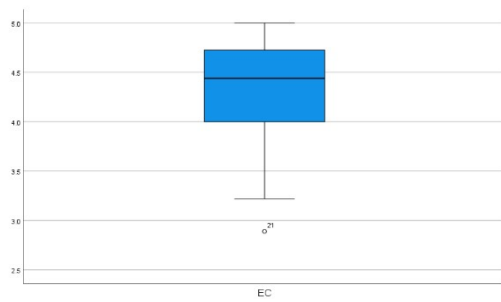
		Statistic	Std. Error
Physical Well Being	Mean	19.81481	1.083464
	95% Confidence Interval for Mean	Lower Bound	17.58772
		Upper Bound	22.04191
	5% Trimmed Mean	20.02881	
	Median	20.00000	
	Variance	31.695	
	Std. Deviation	5.629845	
	Minimum	7.000	
	Maximum	28.000	
	Range	21.000	
	Interquartile Range	9.000	
	Skewness	-.376	.448
	Kurtosis	-.429	.872
Social Well Being	Mean	17.99370	1.291054
	95% Confidence Interval for Mean	Lower Bound	15.33990
		Upper Bound	20.64750
	5% Trimmed Mean	18.15967	
	Median	21.00000	
	Variance	45.004	
	Std. Deviation	6.708513	
	Minimum	5.000	
	Maximum	28.000	
	Range	23.000	
	Interquartile Range	8.000	
	Skewness	-.479	.448
	Kurtosis	-.455	.872
Emotional Well Being	Mean	15.93333	.862911
	95% Confidence Interval for Mean	Lower Bound	14.15959
		Upper Bound	17.70707
	5% Trimmed Mean	15.92593	
	Median	15.00000	
	Variance	20.105	
	Std. Deviation	4.483817	
	Minimum	8.000	
	Maximum	24.000	
	Range	16.000	
	Interquartile Range	8.000	
	Skewness	.199	.448
	Kurtosis	-.956	.872
Functional Well Being	Mean	18.60481	1.144379
	95% Confidence Interval for Mean	Lower Bound	16.25251
		Upper Bound	20.95712
	5% Trimmed Mean	18.73516	
	Median	19.00000	
	Variance	35.359	
	Std. Deviation	5.946370	
	Minimum	6.000	
	Maximum	28.000	
	Range	22.000	
	Interquartile Range	10.000	
	Skewness	-.320	.448
	Kurtosis	-.951	.872
Breast Cancer Scale	Mean	22.05926	1.273254
	95% Confidence Interval for Mean	Lower Bound	19.44205
		Upper Bound	24.67647
	5% Trimmed Mean	21.89918	
	Median	21.00000	
	Variance	43.772	
	Std. Deviation	6.616021	
	Minimum	12.000	
	Maximum	35.000	
	Range	23.000	
	Interquartile Range	9.400	
	Skewness	.292	.448
	Kurtosis	-.791	.872

FACT-B and FACT-G Descriptives

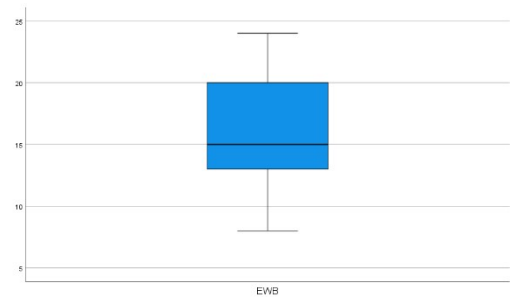
		Statistic	Std. Error
Functional Assessment of Cancer Therapy - General	Mean	71.90222	3.183386
	95% Confidence Interval for Mean	Lower Bound	65.35868
		Upper Bound	78.44577
	5% Trimmed Mean	72.35265	
	Median	73.00000	
	Variance	273.617	
	Std. Deviation	16.541358	
	Minimum	36.000	
	Maximum	100.000	
	Range	64.000	
	Interquartile Range	25.000	
	Skewness	-.533	.448
	Kurtosis	-.343	.872
Functional Assessment of Cancer Therapy - Breast	Mean	93.96148	3.987643
	95% Confidence Interval for Mean	Lower Bound	85.76476
		Upper Bound	102.15820
	5% Trimmed Mean	94.35021	
	Median	97.00000	
	Variance	429.335	
	Std. Deviation	20.720398	
	Minimum	50.000	
	Maximum	133.000	
	Range	83.000	
	Interquartile Range	27.000	
	Skewness	-.415	.448
	Kurtosis	-.269	.872

Appendix 11 Analysis of phase I data

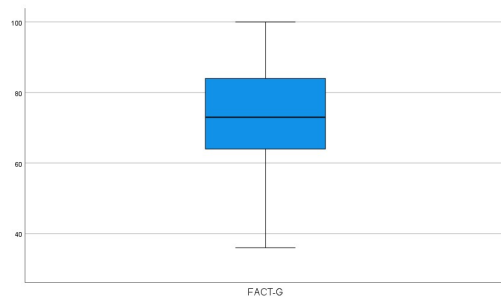
Evaluation of parametric alignment using box plots



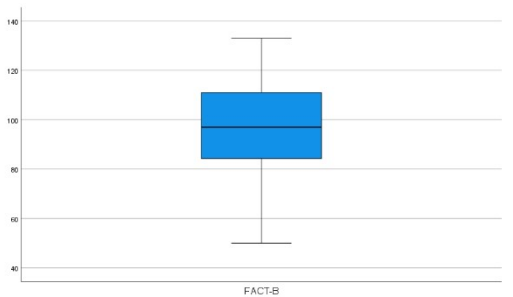
Box plot of Emotional Closeness scores



Box plot of Emotional Well Being scores



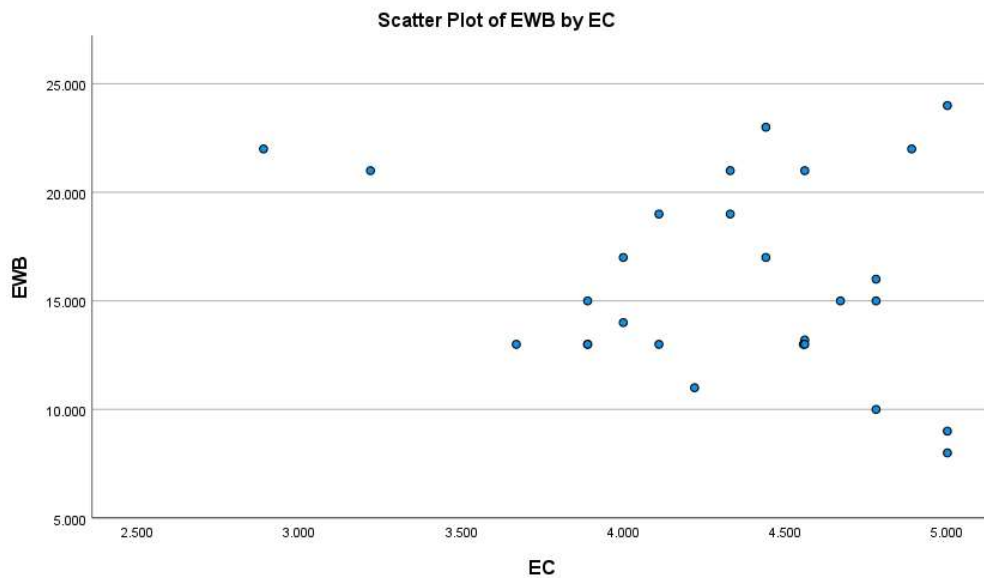
Box plot of FACT-B



Box plot of FACT-G (derivative of FACT-B)

Result - box plots suggest non-parametric data, therefore Spearman's rho coefficient applicable.

Assessment of potential relationship between variables using scatter plots



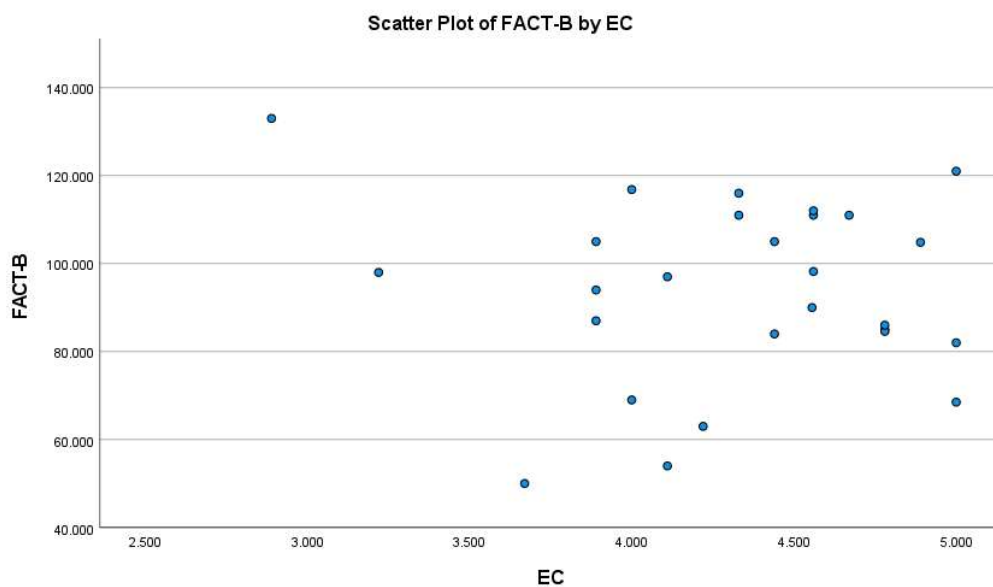
Scatter plot to ascertain likelihood of relationship between EWB and EC.

Result - due to random distribution of data points and outliers plot indicates potential for a relationship to exist is considered low.

Non Parametric Correlation

		EC		EWB
Spearman's rho	EC	Correlation Coefficient	1.000	-.100
		Sig. (2-tailed)	.	.621
		N	27	27
	EWB	Correlation Coefficient	-.100	1.000
		Sig. (2-tailed)	.621	.
		N	27	27

Result - Correlation coefficient indicates there is no evidence in the data to conclude a relationship exists.



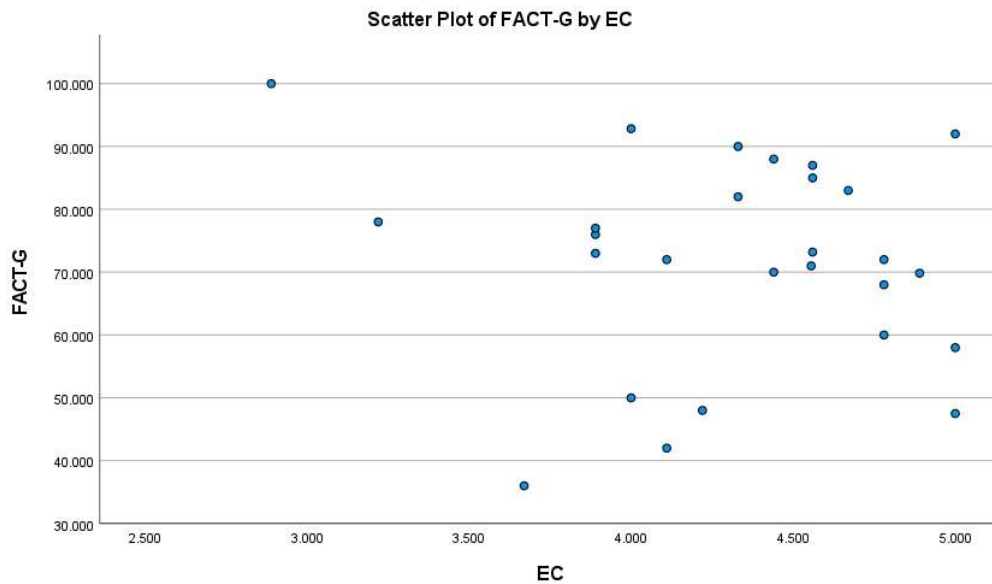
Scatter plot to ascertain likelihood of relationship between FACT-B and EC

Result - due to random distribution of data points and outliers plot indicates potential for a relationship to exist is considered low.

Non Parametric Correlation

		EC		FACT-B
Spearman's rho	EC	Correlation Coefficient	1.000	-.029
		Sig. (2-tailed)	.	.886
		N	27	27
	FACT-B	Correlation Coefficient	-.029	1.000
		Sig. (2-tailed)	.886	.
		N	27	27

Result - Correlation coefficient indicates there is no evidence in the data to conclude a relationship exists.



Scatter plot to ascertain likelihood of relationship between FACT-G and EC

Result - due to random distribution of data points and outliers plot indicates potential for a relationship to exist is considered low.

Non Parametric Correlation

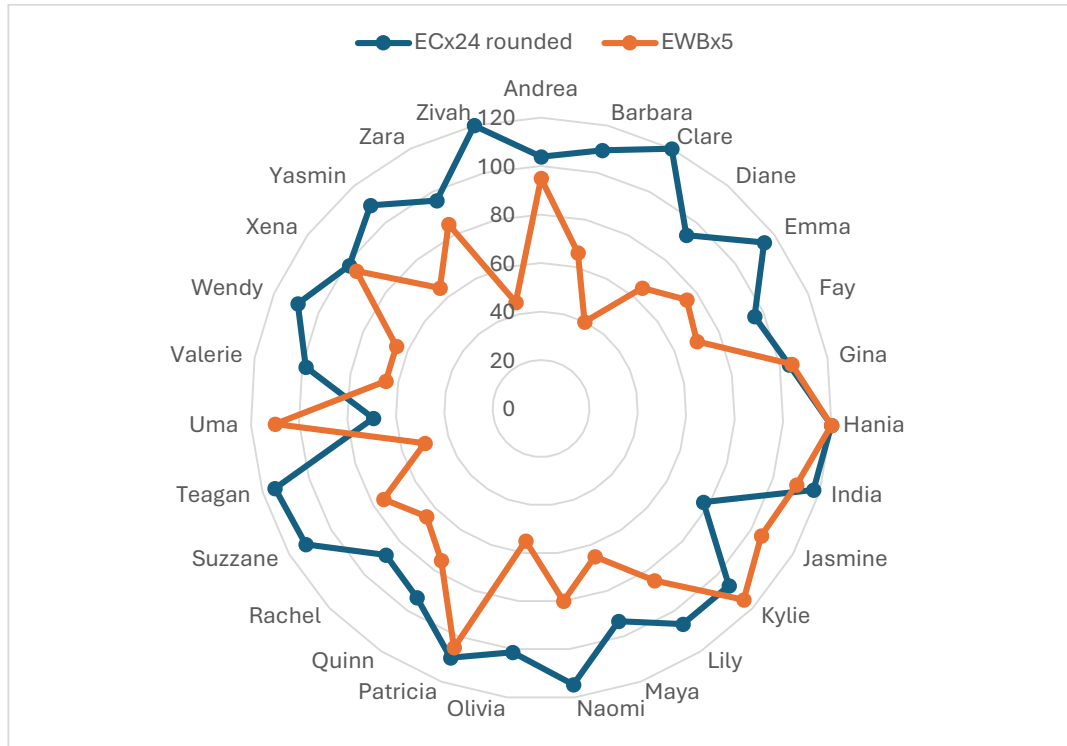
		EC	FACT-G
Spearman's rho	EC	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
		N	27
	FACT-G	Correlation Coefficient	-.144
		Sig. (2-tailed)	.472
		N	27

Result - Correlation coefficient indicates there is no evidence in the data to conclude a relationship exists.

Appendix 12 Relationship between EC (mMDORS) & EWB (FACT-B)

Radar chart showing the relationship between EC (mMDORS) & EWB (FACT-B) scores for each participant (as shown by common multiples).

Emotional Closeness (EC) ≤ 24 = less emotional closeness 120 = strong emotional closeness
Emotional Well Being (EWB) 0 = low emotional wellbeing 120 = high emotional well being



Whilst examination of each individual's scores provide insight, cases of note are Hania who scored the highest for both EC and EWB, suggesting she had a close relationship with her dog and experienced high levels of emotional wellbeing and Clare who scored the maximum (120) for EC, also the lowest recorded score for EWB, indicating she too had a close relationship with her dog but that her emotional wellbeing had diminished.

Appendix 13 Analysis of response frequency for the mMDORS questions

Dog–Owner Interaction (DOI) 1 = less interaction 5 = great interaction
 Emotional Closeness (EC) 1 = less emotional closeness 5 = strong emotional closeness
 Perceived Costs (PC) 1 = high perceived cost 5 = low perceived cost

PC Q1 How hard is it to look after your dog?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	3	11.1	11.1	11.1
	2	13	48.1	48.1	59.3
	3	9	33.3	33.3	92.6
	4	2	7.4	7.4	100.0
Total		27	100.0	100.0	

DOI Q2 How often do you kiss your dog?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	4	14.8	14.8	14.8
	3	1	3.7	3.7	18.5
	4	3	11.1	11.1	29.6
	5	19	70.4	70.4	100.0
Total		27	100.0	100.0	

EC Q3 I wish my dog and I never had to be apart

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	2	7.4	7.4	7.4
	3	2	7.4	7.4	14.8
	4	13	48.1	48.1	63.0
	5	10	37.0	37.0	100.0
Total		27	100.0	100.0	

PC Q4 My dog makes too much mess

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	9	33.3	33.3	33.3
	2	15	55.6	55.6	88.9
	3	2	7.4	7.4	96.3
	5	1	3.7	3.7	100.0
Total		27	100.0	100.0	

DOI Q5 How often do you play games with your dog?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	2	7.4	7.4	7.4
	3	1	3.7	3.7	11.1
	4	6	22.2	22.2	33.3
	5	18	66.7	66.7	100.0
Total		27	100.0	100.0	

PC Q6 It bothers me that my dog stops me from doing things I enjoyed before I owned it

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	18	66.7	66.7	66.7
	2	8	29.6	29.6	96.3
	3	1	3.7	3.7	100.0
Total		27	100.0	100.0	

DOI Q7 How often do you take your dog to visit people

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	2	7.4	7.4	7.4
	2	11	40.7	40.7	48.1
	3	5	18.5	18.5	66.7
	4	1	3.7	3.7	70.4
	5	8	29.6	29.6	100.0
Total		27	100.0	100.0	

PC Q8 It is annoying that I sometimes have to change my plans because of my dog

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	10	37.0	37.0	37.0
	2	12	44.4	44.4	81.5
	3	3	11.1	11.1	92.6
	4	2	7.4	7.4	100.0
Total		27	100.0	100.0	

PC Q9 My dog costs too much money

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	12	44.4	44.4	44.4
	2	15	55.6	55.6	100.0
Total		27	100.0	100.0	

DOI Q10 How often do you buy your dog presents?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	2	7.4	7.4	7.4
	2	12	44.4	44.4	51.9
	3	5	18.5	18.5	70.4
	4	4	14.8	14.8	85.2
	5	4	14.8	14.8	100.0
Total		27	100.0	100.0	

EC Q11 My dog is constantly attentive to me

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	1	3.7	3.7	3.7
	3	7	25.9	25.9	29.6
	4	9	33.3	33.3	63.0
	5	10	37.0	37.0	100.0
	Total	27	100.0	100.0	

DOI Q12 How often do you give your dog food treats?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	4	6	22.2	22.2	22.2
	5	21	77.8	77.8	100.0
	Total	27	100.0	100.0	

EC Q13 How often do you tell your dog things you don't tell anyone else?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	5	18.5	18.5	18.5
	2	4	14.8	14.8	33.3
	3	4	14.8	14.8	48.1
	4	5	18.5	18.5	66.7
	5	9	33.3	33.3	100.0
	Total	27	100.0	100.0	

PC Q14 How often do you feel that looking after your dog is a chore?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	22	81.5	81.5	81.5
	2	4	14.8	14.8	96.3
	3	1	3.7	3.7	100.0
	Total	27	100.0	100.0	

PC Q15 How often does your dog stop you from doing things you want to?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	18	66.7	66.7	66.7
	2	6	22.2	22.2	88.9
	3	2	7.4	7.4	96.3
	4	1	3.7	3.7	100.0
	Total	27	100.0	100.0	

EC Q16 I would like to have my dog near me all the time

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	3	11.1	11.1	11.1
	3	3	11.1	11.1	22.2
	4	9	33.3	33.3	55.6
	5	12	44.4	44.4	100.0
	Total	27	100.0	100.0	

DOI Q17 How often do you groom your dog?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	2	7.4	7.4	7.4
	2	7	25.9	25.9	33.3
	3	10	37.0	37.0	70.4
	4	6	22.2	22.2	92.6
	5	2	7.4	7.4	100.0
	Total	27	100.0	100.0	

EC Q18 If everyone else left me my dog would still be there for me

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	1	3.7	3.7	3.7
	4	7	25.9	25.9	29.6
	5	19	70.4	70.4	100.0
	Total	27	100.0	100.0	

PC Q19 How often do you feel that having a dog is more trouble than it is worth?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	25	92.6	92.6	92.6
	2	1	3.7	3.7	96.3
	5	1	3.7	3.7	100.0
	Total	27	100.0	100.0	

EC Q20 My dog helps me get through tough times

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	1	3.7	3.7	3.7
	4	4	14.8	14.8	18.5
	5	22	81.5	81.5	100.0
	Total	27	100.0	100.0	

DOI Q21 How often do you hug your dog?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	1	3.7	3.7	3.7
	4	2	7.4	7.4	11.1
	5	24	88.9	88.9	100.0
	Total	27	100.0	100.0	

EC Q22 My dog provides me with constant companionship

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	1	3.7	3.7	3.7
	4	9	33.3	33.3	37.0
	5	17	63.0	63.0	100.0
	Total	27	100.0	100.0	

DOI Q23 How often do you have your dog with you while relaxing, i.e. watching TV?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5	27	100.0	100.0	100.0

EC Q24 My dog is there whenever I need to be comforted

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	1	3.7	3.7	3.7
	4	8	29.6	29.6	33.3
	5	18	66.7	66.7	100.0
	Total	27	100.0	100.0	

EC Q25 How traumatic do you think it will be for you when your dog dies?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	1	3.7	3.7	3.7
	4	5	18.5	18.5	22.2
	5	21	77.8	77.8	100.0
	Total	27	100.0	100.0	

Appendix 14 Participant information for phase II

Hello

As a PhD student based in the Psychology Department within the Faculty for Health and Society at the University of Northampton. I am conducting this study which will explore in detail the relationship between women living with breast cancer and their dogs, and would like to invite you to participate.

I currently work in nurse and allied health professional's undergraduate and post graduate education provision, have an interest (due to also being a dog trainer) in human – dog interaction in response to illness, and am a qualified therapeutic radiographer.

This sheet provides information about the study and what participation will involve. I hope it answers any questions you may have but if you do have any further questions please do contact me melissa.symonds@northampton.ac.uk

Information for participants – individual discussions

Dear *(insert name)*

Thank you for expressing interest in participating in this study.

Your insights will be used to help professionals caring for you to understand about the way in which having breast cancer may affect your relationship with your dog and life. I am interested in exploring your day-to-day experience of breast cancer and how it impacts upon caring for your dog/s.

Before you decide whether to take part it is important for you to understand what the study would involve and how it is being conducted.

Please take some time to read the information below.

What would my participation involve?

Initially I would like to arrange to visit you at home and at a mutually convenient time, this would be to meet you and your dog and provide you with an opportunity me to answer any questions you may have about the study before deciding whether to continue your involvement with the project.

This first meeting would be quite short and include a discussion of the consent form which I would leave with you so that you can have time to read through the document and decide in your own time whether you wish to continue with subsequent meetings.

If you decide to be involved a second and third final meeting would be arranged, during which we would chat about your experience of living with breast cancer and spending time with your dog, this meeting would be recorded using subtle video techniques and it would be great if your dog was present during this time.

The video would only be used to assist with the recall of the meeting when writing up notes, the spoken word would be transcribed and some notes about observations of your dog made, during this time the recordings would be held on a secure password protected data base, five years after the end of the study the recordings would be destroyed.

Do I have to take part?

Taking part is entirely voluntary and you do not need any special skills to be able to do so.

Will I need to sign to say I am happy to participate?

You will be asked to sign a consent a form which will be left with you at the first meeting for your consideration, you will also receive a copy of this completed form.

If at any time during the meetings or between them you decide you no longer wish to take part, then that is your choice and you will not have to provide an explanation for withdrawing.

What are the possible benefits of taking part?

Your insights will be used to help professionals like the ones who may be caring for you understand about the bond women with breast cancer have with their dogs, and the importance and role your dogs have in your life.

What are the possible risks or disadvantages of taking part?

There is a potential for stressful subjects to be brought up, as you will be asked to tell your story, however you will be able to give as much information as you feel comfortable with, and stop the interview at any point.

What if something goes wrong?

If you have any concerns about any aspect of the study or the way you have been approached or treated during the course of this study, please contact my PhD supervisor Dr Federico Farini (federico.farini@northampton.ac.uk)

Will my information be kept confidential?

All information collected during this study will be kept confidential. Only the researcher and project supervisors will have access to it.

Interview recordings, notes and transcripts with any identifying information will be held on a University password protected secure data system, and will be destroyed five years after the end of the study.

Data will be anonymised to ensure there is no identifiable information apart from that of the researcher, this data will be stored as encrypted files on a password protected computer in accordance with the General Data Protection Regulations (2018).

Confidentiality will only be compromised in accordance with researcher's duty of care to disclose any concern of risk or danger. In these circumstances the information disclosed will be reported to the appropriate official authority.

What will happen to the results of the study?

The results of this study will only be disseminated in appropriate academic forums such as journals or conference papers and form the basis of a PhD thesis. It is hoped that thesis will include anonymised quotes from participants and you will be asked as part of the consent process whether you would be happy for quotes or documented observations to be included in the academic text or would prefer to review their inclusion later during the write up process.

If you would like to be provided with a copy of the main findings of the study, post thesis writing, please indicate this on the consent form, or contact the lead researcher.

Who has reviewed the study?

This research has been approved by the Research Degrees Ethics Committee of The University of Northampton

Contact for further information.

Should you have any further questions or want to discuss anything informally, please do not hesitate to contact me by email melissa.symonds@northampton.ac.uk or phone 01604 892862.

Yours sincerely

Melissa Symonds
Post Graduate Researcher

Appendix 15 Participation information for phase II used during the Covid pandemic

Participation information for phase II adapted for use during the Covid pandemic, supplied on institution headed paper.

In person video recording converted to recorded to telephone calls, text amendments shown in bold italics.



Hello

As a PhD researcher based in the Psychology Department within the Faculty for Health and Society at the University of Northampton. I am conducting this study which will explore in detail the relationship between women living with breast cancer and their dogs and would like to invite you to participate.

I currently work in nurse and allied health professional's undergraduate and post graduate education provision, have an interest (due to also being a dog trainer) in human – dog interaction in response to illness, and am a qualified therapeutic radiographer.

This sheet provides information about the study and what participation will involve. I hope it answers any questions you may have but if you do have any further questions please do contact me melissa.symonds@northampton.ac.uk

Information for participants – individual discussions

Thank you for expressing interest in participating in this study.

Your insights will be used to help professionals caring for you to understand about the way in which having breast cancer may affect your relationship with your dog and life. I am interested in exploring your day-to-day experience of breast cancer and how it impacts upon caring for your dog/s.

Before you decide whether to take part it is important for you to understand what the study would involve and how it is being conducted.

Please take some time to read the information below and please contact me if you have any questions.

What would my participation involve?

As you have kindly expressed an interest in participating in the second part of my research and we have had a brief chat about it via email, this information is in reference to the next and subsequent phone calls which would be recorded.

If you decide to be involved in the **recorded interviews**, these will be arranged at a time that is convenient for you. During our call we would chat about your experience of living with breast cancer and spending time with your dog, this meeting would be recorded using **a Dictaphone**.

The recordings would be transcribed, and recordings and anonymised transcriptions held on a secure password protected data base. Five years after the end of the study the recordings would be destroyed.

Do I have to take part?

Taking part is entirely voluntary and you do not need any special skills to be able to do so.

Will I need to sign to say I am happy to participate?

You will be asked to sign a consent a form which **will be sent to you in advance of the first recorded conversation taking place**, you will also be offered a copy of this completed form for your records.

If at any time during **the calls** or between them you decide you no longer wish to take part, just let me know, don't feel you have to provide an explanation for withdrawing.

What are the possible benefits of taking part?

Your insights will be used to help professionals like the ones who may be caring for you understand about the bond women with breast cancer have with their dogs, and the importance and role your dogs have in your life.

What are the possible risks or disadvantages of taking part?

There is a potential for stressful subjects to be brought up, as you will be asked to tell your story, however you will be able to give as much information as you feel comfortable with and stop the interview at any point.

What if something goes wrong?

If you have any concerns about any aspect of the study or the way you have been approached or treated during the course of this study, please contact my PhD supervisor Dr Federico Farini (federico.farini@northampton.ac.uk)

Will my information be kept confidential?

All information collected during this study will be kept confidential. Only the researcher and project supervisors will have access to it.

Interview recordings, notes and transcripts with any identifying information will be held on a University password protected secure data system, and will be destroyed five years after the end of the study.

Data will be anonymised to ensure there is no identifiable information apart from that of the researcher, this data will be stored as encrypted files on a password protected computer in accordance with the General Data Protection Regulations (2018).

Confidentiality will only be compromised in accordance with researcher's duty of care to disclose any concern of risk or danger. In these circumstances the information disclosed will be reported to the appropriate official authority.

What will happen to the results of the study?

The results of this study will only be disseminated in appropriate academic forums such as journals or conference papers and form the basis of a PhD thesis. It is hoped that the thesis will include anonymised quotes from participants and you will be asked as part of the consent process whether you would be happy for quotes or documented observations to be included in the academic text or would prefer to review their inclusion later during the write up process.

If you would like to be provided with a copy of the main findings of the study, post thesis writing, please indicate this on the consent form, or contact the lead researcher.

Who has reviewed the study?

This research has been approved by the Research Degrees Ethics Committee of The University of Northampton

Contact for further information.

Should you have any further questions or want to discuss anything informally, please do not hesitate to contact me by email melissa.symonds@northampton.ac.uk or phone 01604 892862.

Yours sincerely

Melissa Symonds

PhD Researcher

Appendix 16 Consent form – for individual meetings

Original for in-person and participant recorded video submission

Consent form – for individual meetings

Project title: women with breast cancer, their relationship with their dogs

Please read each statement below and then confirm that you agree or disagree by placing your initials in the appropriate box.

	YES	NO
I confirm I have read and understand the information provided to me in regard to participating in this research.		
I confirm I have had the opportunity to ask questions about this research and have these answered satisfactorily.		
I agree to having my interview video recorded.		
I understand that my involvement is voluntary and that I am free to withdraw at any time.		
I understand that I can withdraw my answers in part or full anytime up to <u>two weeks after the third / final meeting has taken place.</u>		
I agree to my anonymised quotations being used in any scientific presentations or publications of this work.		
I agree to my data being used for this research.		
I agree to my data being in any subsequent work that builds on this current project.		

Signature and date of person giving consent (the participant).

Signature and date of person obtaining consent (the researcher).

Appendix 17 Consent form for individual phone discussion

Adapted due to Covid pandemic, text amendment shown in bold italics

Consent form – for individual phone discussion

Project title: women with breast cancer, their relationship with their dogs

Please read each statement below and then confirm that you agree or disagree by placing your **initials** in each of the appropriate boxes.

	YES	NO
I confirm I have read and understand the information provided to me in regard to participating in this research.		
I confirm I have had the opportunity to ask questions about this research and have these answered satisfactorily.		
<i>I agree to having my interview telephone conversation recorded.</i>		
I understand that my involvement is voluntary and that I am free to withdraw at any time.		
I understand that I can withdraw my answers in part or full anytime up to <u>two weeks after the third / final meeting/call has taken place.</u>		
I agree to my anonymised quotations being used in any scientific presentations or publications of this work.		
I agree to my data being used for this research.		
I agree to my data being in any subsequent work that builds on this current project.		

Signature (or print name) and date of person giving consent (the participant).

Signature and date of person obtaining consent (the researcher).

Appendix 18 Interview structure

Interview structure

First meeting

Thank you for offering to participate in my research.

This meeting is just to say hello to you and your dog (what's your dog's name?) and to have a chat about the research and answer any questions you may have.

Did you receive the information sheet about the research?

(Confirm receipt and refer to printed information sheet- which will be left with participant)

Do you have any questions about the study?

(Answer any questions)

Is there anything else you would like to know?

(Answer any questions)

Before we arrange the next meeting, I need to just explain the consent form which I will leave with you for your consideration.

This is the consent form

(Give consent form and go through questions)

Thank you for your time, its been lovely meeting you and (name of dog)

Would you like to arrange our next meeting now, or would you prefer I give you a ring in a weeks' time?

Second meeting (to take place no sooner than 2 weeks after first meeting)

Thank you for agreeing to meet with me again and for helping me with my research.

Before we continue could I just ask if you are happy to go ahead with the interview and ask you to sign the consent form please.

(Check and sign consent form)

The discourse for narrative analysis will be based upon an unstructured interview and as such the discussion will flow through the use of reflecting back the last comments made by the participant. Throughout the conversation the participant will be encouraged to continue their dialogue through the use of empathetic communication facilitative skills, including acknowledgement, clarification, appropriate silences and reflection.

As you know I am interested in finding out more about your relationship with (name of dog) and how having him /her during your cancer pathway / experience has helped you, from the score on the questionnaire I can see that you have a strong relationship with your dog (*name dog*).

Could you tell me more please about how things have been and how having (name of dog) has helped you during this difficult time

The discourse will continue until a natural break or either party indicates they wish to stop, it is anticipated that this will be at maximum of 1 ½ hours, but will be flexible depending upon the flow of the conversation.

I am conscious we have been chatting for (time) now and just wonder whether we should stop at this point as ...

Perhaps I could arrange to come back another week and we can continue the conversation.

Thank you for your time, when would be a suitable time for me to come and visit again?

Third meeting

Thank you for agreeing to meet with me again and for helping me with my research.

Before we continue could I just ask if you are happy to go ahead with the interview and ask you to sign the consent form again please.

(answer any questions & check and sign consent form)

Since we met last I have had an opportunity to listen to our conversation and remember you saying about...I just wondered if you could tell me a little more about how having (name of dog) has helped you during that time..

The discourse for narrative analysis will be based upon an unstructured interview and as such the discussion will flow through the use of reflecting back the last comments made by the participant.

Throughout the conversation the participant will be encouraged to continue their dialogue through the use of empathetic communication facilitative skills, including acknowledgement, clarification, appropriate silences and reflection.

The discourse will continue until a natural break or either party indicates they wish to stop, it is anticipated that this will be at maximum of 1 ½ hours, but will be flexible depending upon the flow of the conversation.

I am conscious we have been chatting for (time) now and just wonder whether we should stop at this point as ...

Thank you for your time, it's been great to meet you and to hear about your experiences and (name of dog), talking to you and others with breast cancer has helped me learn so much about the role dogs have in your life, many important aspects and factors that I feel that health professionals need to understand when providing care.

Explain how results will be compiled and that transcripts etc will be sent for consideration during the process. Final thank you and ensure contact details should any further questions arise.

Appendix 19 Guidance - own recording / written narrative

Dear

Thank you for agreeing to participate in the second part of my research and for completing the consent form, please find attached a signed by me copy of the consent form for your records.

Please also find attached some suggestions of how to record and share your thoughts, whether written or recorded, or a combination if you prefer.

Thank you for taking the time to help me with this research and please share as much, or little, information with me as you feel comfortable with, and do include stories and examples if they help to illustrate any points as these will really help me to understand your situation.

In order to protect your identity within the recording, or written account, please do not share your real name, but do use a pseudonym if you are happy to.

Don't worry if you have interruptions or want a break within a recording, and please feel free to record in any location, for example if you feel more comfortable to speak when at the bottom of the garden or on a walk that is fine.

When recording

Please start your recording with the date of the recording and your chosen pseudonym name, maybe something like "Hello it's Flo here on Monday, the 21st of April..."

When recording (video / audio) your response please record your thoughts as several short recordings, ideally up to 10 minutes long, this way you can check that your recording has worked, and it will hopefully make it easier to share with me.

Please do not worry if you have interruptions or want a break within a recording, and do feel free to record in any location, for example if you feel more comfortable to speak when at the bottom of the garden or on a walk that is fine.

When you have finished your recording please save your recording on your computer hard drive or within the cloud e.g. One Drive, Dropbox, iCloud, G cloud etc.

What to include in the recording or account

Introduce yourself

Please tell me a little about yourself, but only tell me what you are happy to share. It would also be good to know if, in this current time, you are being shielded/working from home/working out of the home and also a little about your employment situation and current living arrangements.

Introduce your dog

Please introduce me to your dog(s), by letting me know their names, how long you have had them, how come you came to share your life with them. If you would not mind, please briefly describe their personality and anything else you would like to share, if writing or audio recording it would be great if you could include a photo of your dog(s) as well.

Main research question

As you know I am interested in finding out more about your relationship with your dog/s and how having him /her during your cancer care pathway / experience has helped you, from the score on the questionnaire I can see that you have a strong relationship with your dog/s.

Could you please tell me more about how things have been and how having your dog has helped you during this difficult time.

How long does the account need to be?

Whilst I do not want to put any limits on the length of the recording or the written account, to give you an idea of length, if circumstances had been different and we have been able to meet face-to-face I would have anticipated that we would have had two one hour sessions where I would have hoped to record your thoughts and observe your dog/s.

How do I share my recording or written account?

When you are ready to share your recording or written account with me please could you let me know and we can discuss the best way to do this, there are several possibilities you could email a file (assuming it is not too large), email a link to the file on your cloud, save to my cloud or I could send you a password protected memory stick/flash drive.

How do I contact you?

Please email me

melissa.symonds@northampton.ac.uk

or phone 01604

Many thanks for all your help, and please do let me know if you have any questions or would like to discuss anything.

Kind regards

Melissa

Additional support

Whilst it is not anticipated that my research should be in any way upsetting but should you be affected by anything you talk about, these are some organisations you may like to contact for support.

Appendix 20 Tactile pocket hug

Tactile pocket hug – designed as a faux fur worry worm.

