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University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

The Influence of Attachment Styles, Dyadic Processes and Affective States on Health Outcomes of Women with Breast Cancer and their Identified Significant Other.

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**A thesis submitted in partial fulfilment for the requirements for the degree of Doctor of Philosophy
(Nursing Research)**

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"No one is useless in this world who lightens the burden of another"

Charles Dickens

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Declaration

This is to declare that the content of this thesis is my own work and has not been submitted for another degree, either at University College Cork or elsewhere, where the work of others has been used to augment an argument it has been referenced accordingly. I have read and understood the regulations of University College Cork concerning plagiarism

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Abstract

Background: Breast cancer is one of the most common diagnosed cancers in Ireland (National Cancer Registry Ireland (NCRI), 2014). In today's healthcare system women with breast cancer are now more than ever being supported through their disease trajectory by the significant others in their lives. While significant others of women with breast cancer are increasingly being involved in their care, little research has been conducted that explores the relationship between women with breast cancer and their significant other. The rationale for this study was prompted by the current change within the Irish healthcare system whereby a transference of breast cancer services to outpatient settings and day procedures means that now more than ever significant others of women with breast cancer are involved in their care. Exploring this relationship is beneficial to healthcare professionals who care for these women as it can aid in further understanding the care needs of these individuals.

Aim: To examine the influence of attachment style, dyadic processes and affective states on quality of life for women with breast cancer and their identified significant other, using the principles of attachment theory (Bowlby, 1969) and underpinned by a framework devised by Pietromonaco, Uchino and Schetter, (2013).

Method: A cross sectional correlational survey design was used. Data were collected using a multi-scale questionnaire devised by the researcher, consisting of validated instruments which were administered to both the woman with breast cancer and her significant other. The questionnaire consisted of: questions assessing socio-demographics, The Relationship Questionnaire (RQ), The Berlin Social Support Scale, The Hospital Anxiety and Depression (HADS) Scale, The Relationship Satisfaction subscale and the Functional Assessment to Cancer Therapy scale (for use with both Breast Cancer and General Populations). Data were analysed using SPSS software 22.0. The Actor-Partner Interdependence Model (APIM) was used in analysing dyadic data.

Sample: A convenience sample of women with breast cancer (n=147) and significant others (n=127) was recruited by the researcher from a pre assessment clinic and an outpatient clinic within a breast care centre, at a large urban hospital in the South of

Ireland. A significant other was defined as the individual the woman identified as being most significant in their care, at the current time. Data from 114 dyad pairs (i.e. both the woman with breast cancer and her identified significant other) who completed the questionnaire, were extracted to form the dyad sample in the study.

Findings: It was found that affective states relating to anxiety and depressive symptoms were strongly and negatively correlated with quality of life for both the women with breast cancer and their significant other ($p \leq 0.001$). Significant others were found to report poorer quality of life (*M*=77.3, *SD*=4.25) than women with breast cancer (*M*=88.6, *SD*=10.61). Furthermore, the dyadic data analysis identified that being a significant other of a woman with breast cancer was associated with a lower quality of life ($p \leq 0.05$).

Conclusion: The study identified that the principles of attachment theory are applicable to the breast cancer context. The framework devised by Pietromonaco et al., (2013) was found to be applicable to this context, although adaptation was required. This research has provided substantial rationale for studying dyads in the breast cancer context as it has highlighted the impact that a breast cancer diagnosis has not only on the woman with breast cancer but on her significant other and their relationship. Thus, clinicians, practitioners and researchers need to be aware of the important role that dyadic relationships play in the care trajectory of the woman with a breast cancer diagnosis and their impact on the woman’s significant other.

Introduction

Globally, breast cancer is recognised as one of the most commonly diagnosed cancers, affecting over 1.7 million people annually, it accounts for 23% of all cancer diagnoses and 14% of cancer deaths (Howlander, Noone, Krapcho, Garshell, Miller, Altekruse, Kosary, Yu, Ruhl, Tatalovich, Mariotto, Lewis, Chen, Feuer and Cronin, 2014). Breast cancer presents serious life time health risks with 1 in 8 women expected to be diagnosed with breast cancer (Jemal, Bray, Center, Ferlay, Ward and Forman, 2011; National Cancer Registry Ireland (NCRI), 2016). While males are also affected by breast cancer, this is considered to represent less than 3% of overall number of diagnoses globally (World Health Organisation (WHO), 2013). Cancer of the breast effects women in both the developed and developing world and has the highest mortality rate (458,000 deaths) among women globally (WHO, 2016). The USA and UK represent the countries with the highest rates of breast cancer, however incidences are high worldwide.

In Ireland the majority of breast cancer diagnoses are females between the ages of 45 and 65, with less than 1% representative of a male population (NCRI, 2014). Despite the high incidence rates of breast cancer among women, over 80% are estimated to survive breast cancer 5 years following diagnosis (Parkin, Pisani and Ferlay, 2008; Irish Cancer Society, 2013). The WHO attributes these survival rates to early detection and screening programmes (WHO, 2013). These advanced screening programmes are leading to earlier detection rates, which impact on disease outcomes. As a result of these screening programmes and increases in life expectancy, the incidence of breast cancer is projected to rise within the forthcoming years (WHO, 2016).

Increasingly breast cancer care is being provided on an outpatient basis. This is particularly evident in Ireland where the transference of healthcare services to outpatient and community settings is growing. As a result of this alteration within the healthcare setting, the family, friends and support networks of women with breast cancer are now more than ever involved in the care process. It is estimated that the care provided by families and friends of women with breast cancer saves the Health Service over two billion euro per annum (Guidera, 2001). This figure is indicative of the resource that these significant others provide (Guidera, 2001: Irish Cancer Society, 2013). The importance of significant others and carers within our healthcare system has also been recognised at national and policy levels, with the Health Service Executive (HSE) report on Irish Government and Health Care Policy on Family Carers/Older People, stating that "family carers play a valuable role in our society" (HSE, 2011 p.1) and that policies and programmes should be reflective of this (HSE, 2011).

Caregiving can be divided into formal and informal caregiving. Formal care is defined as any care (private or public) where professional aid has been organised and paid for, usually by national means (WHO, 2013). In contrast to this, the term informal carers refers to any person, such as a family member, friend or neighbour, who provides regular, ongoing assistance to another person without payment for the care given (WHO, 2013). Within the Irish healthcare system, the majority of care provided to women with breast cancer is delivered by family and friends (Guidera, 2001; Irish Cancer Society, 2013). While in most cases the identified caregiver is the spouse or partner of the woman with breast cancer, studies have shown that other categories of carers also exist. The significant other of the woman with breast cancer is the person with whom she feels most connected (Kunzler, Nussbeck, Moser, Bodenmann and Kayser, 2014). This can be a mother, sister, sibling or friend etc. As a shift occurs in the health services where informal care takes precedent, an understanding of the relationship between women with breast cancer and their identified significant other may provide healthcare professionals with an insight into how this relationship can assist the woman with breast cancer.

This thesis provides a detailed discussion of the important role that significant others play in the life of the woman with breast cancer. Research has identified the effect that a breast cancer diagnosis can have on women and their significant others (Schmidt, Nachtigall, Wuethrich-Martoneb and Strauss, 2002). The diagnosis can alter the existing relationship and present further challenges for both the woman and her significant other (Kunzler et al., 2014). This PhD study aims to examine the relationship dynamic between women with breast cancer and their significant others. The thesis is divided into chapters, in chapter one an overview of breast cancer is presented. In chapter two the theoretical literature that was searched in order to identify a theoretical framework for the research study is outlined. In chapter three the empirical literature reviewed pertaining to supportive relationships within a breast cancer context is discussed. The methodology for the research study is presented in chapter four. The results of the study are presented in chapter five and finally chapter six provides a detailed analytical discussion of the findings in relation to the literature.

Chapter I Breast Cancer: An Overview

Introduction

This chapter provides an overview of the epidemiology of breast cancer, its staging and treatments as well as the impact that a breast cancer diagnosis can have on women and their significant other. The effect that breast cancer has on the woman's relationship is also discussed.

1.1 Epidemiology

Cancer is defined as the abnormal mutation of cells during the division process in cell growth. Such prolific growth can be linked to cellular DNA (Deoxyribonucleic acid) damage and other processes whereby cancer cells avoid the programmed death of cells (apoptosis) (Fernald and Kurokawa, 2013). These cancerous cells can combine together: collections of these immature abnormal cells are defined as tumours (WHO, 2013). Tumours can be benign or malignant. Benign tumours are not considered cancerous. The cells in benign tumours appear normal and do not invade nearby tissues or spread to other parts of the body. Malignant tumours are cancerous. These tumours can spread beyond the original tumour to other parts of the body (NCRI, 2014). Breast cancer is the term used to refer to a malignant tumour that has developed in the cells of the breast tissue (WHO, 2011). Breast cancer cells can invade nearby healthy breast tissue affecting the lymph nodes in the axilla region (WHO, 2011). These lymph nodes are part of the lymphatic system that drains foreign substances out of the body via nodes and vessels (WHO, 2011). Cancer cells can infiltrate the lymph nodes and then travel to other parts of the body (WHO, 2011), haematological spread of cancer is also a significant concern.

While the specific aetiology of breast cancer is unknown, breast cancer has been associated with common risk factors, such as tobacco smoke, radiation and other carcinogens (NCRI, 2014). In addition, a high percentage of cancers are considered treatable with surgery, radiotherapy or chemotherapy, especially when associated with early detection (WHO, 2013). While the precise cause of breast cancer is not always known, recently interest has grown in distinguishing between risk factors for different subtypes. Up to 10% of breast cancer cases are hereditary and a woman's chance of developing breast cancer is increased if any of her first degree relatives have breast cancer, particularly if more than one relative has been affected. Women who carry the BRCA1 gene mutation have a 65% chance of developing breast cancer, while those who carry the BRCA2 mutation have a 45% chance (American Cancer Society, 2013). Among family history and genetics, other factors, such as, exposure to low doses of radiation such as X-rays or a history of benign breast disease can also increase the risk of developing breast cancer (American Joint Commission on Cancer (AJCC), 2013). The risk factors associated with breast cancer can be extensive and may be more than one. The major determinant of breast cancer risk is excessive exposure to oestrogen (WHO, 2013). While the aetiology of breast cancer remains relatively unknown, its stage can be determined. Staging of the disease can present challenges to the woman and her significant other. The stages and treatment in breast cancer are discussed in the following section.

1.2 Staging and Treatments

After the diagnosis of breast cancer, the cancer is then staged (Appendix 1). Staging of the breast cancer can be clinical or pathological, the use of both systems is recommended by the National Comprehensive Cancer Network (NCCN, 2014). Staging of breast cancer is done for several reasons: it aids in the direction and coordination of treatment, allows for the comparison of similar breast cancers cases and determines prognosis timelines (NCCN, 2014). The clinical staging of breast cancer is outlined in Appendix 1. The American Joint Committee on Cancer (AJCC) recommends the TNM breast cancer staging system (AJCC, 2014). This system was revised in January 2010 and is seen as the main staging protocol used in breast cancer. This involves classifying the Tumour, Node and Metastasis of the cancer. This TNM model is supplemented with information relating to pathology, histology and receptor status.

Following on from the diagnosis and staging of the breast cancer, the appropriate treatment is then considered. The main aim of treatment in breast cancer is to cure or considerably prolong the life expectancy of the woman, while maintaining their quality of life. There are several treatments available to women with breast cancer. These range from surgical intervention, chemotherapy, hormonal therapy (anti-oestrogen), radiotherapy as well combined treatments and regimes (Irish Cancer Society, 2013). Surgical intervention is often the first treatment carried out in breast cancer (WHO, 2013). Breast-conserving surgeries including lumpectomies, as well as mastectomies and lymph node dissections are the main types of surgery. Prophylactic surgery and breast reconstruction are also surgical options. The NCCN (2014) specify that women with Ductal Carcinoma in Situ (DCIS) should be initially treated with breast conserving surgeries plus radiation where possible. Research into breast cancer surgeries comparing mastectomies and breast conserving surgeries has shown similar survival outcomes for women (NCCN, 2014). Factors that impact on the type of surgery performed include the type of cancer, stage of cancer, age and preference of the patient, quality of life and long term prognosis (NCCN, 2014). As with most surgical procedures, complications can occur. The main areas of concern for breast cancer surgeries are the potential risks of infection and delayed healing.

While surgery is often the more common treatment in breast cancer, other treatment options available to women include chemotherapy, radiotherapy, hormone therapy and combined therapy. Chemotherapy is a systemic therapy, affecting the whole body. There are several chemotherapy agents available. Chemotherapy travels through the bloodstream and uses this pathway to target the cancerous cells. Whilst chemotherapy is primarily used in the early stages of breast cancer to destroy cancer cells (AJCC, 2014), it can also be used to reduce the size of the tumour pre surgery or in adjuvant with other therapies (NCCN, 2014). Chemotherapy treatments can present extensive symptoms to women receiving them and often nurses caring for women going through chemotherapy need to provide support, information and knowledge (Beaver, Williamson and Briggs, 2016).

Hormones are naturally occurring substances in the body. This treatment is used if the breast cancer is hormone receptor positive. It is most often used as an adjuvant therapy to help reduce the risk of the cancer coming back post-surgery, but it can be used as neo-adjuvant treatment, as well (NCRI, 2013). Hormone therapy medicines can also be used to help shrink or slow the growth of advanced-stage or metastatic hormone-receptor-positive breast cancers (Irish Cancer Society, 2013). Radiotherapy is the use of high energy rays to cure cancerous cells. It can be given before surgery (neo-adjuvant) to reduce the tumour or after surgery (adjuvant) to treat any remaining diseased cells (NCCN, 2014). Radiotherapy is also often used in conjunction with other therapies such as chemotherapy or hormone therapy (WHO, 2013). The use of radiotherapy to treat symptoms in the palliative context is also discussed in literature (Ferris et al., 2001).

1.3 Impact of Breast Cancer

Breast cancer has a huge impact on the woman and her significant other. This impact can be physical in terms of symptoms and alterations in body image following surgery or treatment, psychological in relation to low mood, depression and fear, social in relation to loss of friends, and relationships, financial in terms of healthcare costs and loss of earnings and emotional in relation to feelings of sadness, hopelessness or helplessness. While the physical effects of treatments are clearly evident, the emotional and psychological side effects can also present huge challenges for the woman. These include anxiety, depression, fear and stress (Belcher et al., 2011). In women with breast cancer, these feelings may be caused by many things, including changes in how they are able to fulfil family or work roles (Beaver et al., 2016). They might feel grief at the losses and changes in their lives that breast cancer brings. The fear of death, suffering, pain, or all the unknown things that lie ahead can cause great emotional distress as well as the combined task of dealing with the physical ailments.

Family members, significant others and caregivers may also feel symptoms of emotional distress (Pinkert et al., 2013). They may feel frustrated or afraid of losing their loved one to breast cancer. The increased support that the woman with breast cancer needs may also mean that the significant other or family member has to change their role also and take on more responsibility and tasks. Women with breast cancer often require support from their significant other or family (Kunzler et al., 2014). Furthermore, a breast cancer diagnosis requires the woman to adapt but also impacts on the adaptation of the significant other. This can cause increased emotional side effects, as the uncertainty can be frightening. In times of this uncertainty it is important for women to feel supported. For this reason the relationships that women have with the individuals in their lives are important considerations in their care.

1.4 Relationships in Breast Cancer

It is well documented in the literature that breast cancer can result in an alteration to the woman and her family's life (Hagerty-Lingler et al., 2008; Kunzler et al., 2014). Breast cancer can also significantly impact on the woman's relationships (Kunzler et al., 2014; Beaver et al., 2016). Since the majority of women with breast cancer are being supported and cared for by their family (Hautamaki-Lamminen et al., 2013), this relationship needs to be explored further. The relationship between women with breast cancer and their significant other is fundamentally complex and dynamic (Hagerty-Lingler et al., 2008). The relationship can be challenged by the breast cancer diagnosis (Kunzler et al., 2014). It can involve several elements and be affected by internal and external stimuli. Studies have linked the quality of life of the woman with breast cancer to the quality of life of their caregiver (Akechi et al., 1998; Chen et al., 2004; Manne et al., 2004; Hagerty-Lingler et al., 2008). Similarly, research on relationships and health have highlighted a correlation between the quality of relationships and health status (Pietromonaco et al., 2013).

The transference of oncology care, particularly breast cancer care to outpatient and day care clinics has resulted in the significant other of these women having a greater role to play in the outcomes for the woman with breast cancer. Therefore, knowledge of the relationship that exists between women with breast cancer and their identified significant other is important to the woman's overall health as these significant others are becoming more prevalent within healthcare. Examining the influence that relationships have on women with breast cancer and their significant others' health outcomes could provide further directions for future care that incorporates relationship elements as key factors.

Summary

This chapter provided a brief overview of breast cancer, pertinent epidemiology, its staging, treatments and impacts on the individuals affected by it. Breast cancer in women is one of the most common cancers diagnosed worldwide. The transference of cancer services to outpatient clinics in an attempt to incur cost savings, places the significant individual of the woman with breast cancer at a central point within her care. Knowledge of the relationship that women with breast cancer have with this significant other and the impact of this relationship on health outcomes for both people in the relationship can aid healthcare professionals (HCP's) in providing practical evidence based support. This is specifically important as previous research with women with breast cancer has identified the need for support from their significant other and the importance of having significant others involved in their care (Hagerty-Lingler et al., 2008). The following chapter discusses the theoretical literature pertinent to women with breast cancer and their significant other.

Chapter II Theoretical Literature

Introduction

Breast cancer is recognised as a prominent health problem within our current healthcare system and the impact that a breast cancer diagnosis has on the relationships between women with breast cancer and their significant other can be extensive. The theoretical literature around breast cancer and relationships was explored, in an attempt to source a theory or model that could be applied to this context. Within this chapter, theoretical literature on women with breast cancer and their significant other is reviewed. The term significant other refers to several types of individuals, as the significant other for women with breast cancer may not be the same person for all women diagnosed with breast cancer. Therefore, for the purpose of this review the significant other is broadly considered the spouse, partner, mother, sibling, child, relative or friend. These significant others are deemed so important that it is estimated that they provide over half of all care to women with breast cancer (Foley, 2008). The review focused on the supportive informal relationships of women with breast cancer.

The discussion outlines theories that can aid in understanding the relationships of women with breast cancer and their significant others. The rationale for choosing the attachment theory is provided. In particular, work depicted by Pietromonaco et al., (2013) (Figure 2.1) is referenced and used as a framework. Although the connections between interpersonal relationships and health are well established (Spiegel et al., 1989; Cohen, 2004; Umberson and Montez, 2010), less is known about the interpersonal processes through which relationships influence health outcomes, despite previous recommendations for this type of research (e.g., House et al., 1988). Therefore, investigating the relationship that women with breast cancer have with their significant other as well as its impact on health outcomes in the breast cancer context, will provide new knowledge necessary to inform changes occurring within current healthcare practices.

2.1 Aim

The aim of this section is to source, identify and present theoretical perspectives including theories, models and frameworks which could be used in the study of the supportive relationship between women with breast cancer and their significant other. These theories, models and frameworks are outlined briefly with further supplemented information including developers, description as well as the pros and cons for use in the current study in Appendix 3.

2.2 Search Strategy

The researcher sought theoretical literature which focused on relationships in terms of health and support as these were identified as the important components for the theory for this study context (Appendix 2). The databases Medline, PubMed, Psych Info, CINAHL, Web of Knowledge and Cochrane library were searched using keywords significant other, family, partner, intimate, relationship(s), care, caring, framework, model(s) and theory. Inclusion criteria for the theoretical literature were: 1) relationships 2) involving two people or more individually 3) the ability to accommodate an external variable such as health and illness processes e.g. breast cancer and a caring/family context. Exclusion criteria were theoretical literature that: 1) did not focus on relationships 2) did not address support, caring or partnership 3) focused on one single aspect of relationships as oppose to viewing the entire relationship interaction as a process. An overview of the theories and models considered with a brief commentary is outlined in Appendix 3.

2.3 Overview of Theories Identified

Several theories and models were reviewed. These included the Bio Psychosocial Model of Care (Santrock, 2007), the McMaster Model of Family Functioning (Epstein et al., 1978), the Social Exchange Theory (Thibaut and Kelley, 1959), the Caring Model (Watson, 1979) and the Attribution Theory (Heider, 1958). The first model was the Bio Psychosocial Model of Care which links the mind, body and spirit as having a significant impact on the health status of an individual (Engel, 1977).This model is particularly useful in the chronic illness context where the individual can be seen to be affected by aspects other than the disease itself. This model views the biological, psychological and social parts of an individual’s life as variables that can affect health outcomes (Santrock, 2007). Its uses are primarily found within the context of the Health Sciences, especially in relation to medical care and practices. This model could provide a useful framework for an overview of the physical and psychological aspects of breast cancer from the woman’s perspective specifically, rather than viewing both the woman with breast cancer and the significant other together. However, its usefulness for a study on women with breast cancer and their relationship with their significant other is limited, as the model does not provide a perspective on the dyadic process underpinning a relationship between two individuals (Fishbein and Ajzens, 1975).

The McMaster Model of Family Functioning identifies core components needed for family structure (Epstein et al., 1978). The model has 6 domains (1) problem solving (2) communication (3) roles (4) behavioural control (5) affective involvement and (6) affective responsiveness. The model focuses on the family constantly striving to maintain the family unit as secure. It suggests that when a family is presented with a problem or threat, a 7 step process occurs where the family attempt to resolve the issue. This model presents the idea that involvement in families requires the maintenance of defined roles and behaviour that benefit the family unit as a whole. Communication including nonverbal, masked or indirect is also seen as a key element of family functioning. While this model could provide insight into family dynamics, as the focus of this review is on the relationship dyad of the woman and her significant other the model was deemed inappropriate as it is more concerned with the family unit in its totality. As this study was focused on the dyadic relationship between the woman with breast cancer and her significant other this model was not selected.

The Social Exchange Theory (Thibaut and Kelley, 1959) clarifies when and why individuals develop and continue some personal relationships while ending others. The theory is based on a system of rewards and costs. This theory states that relationships work by comparing benefits gained versus costs to the person, to attain those benefits. It is proposed that people want to make the most of the benefits while lessening the costs (Mini-max Principle). Thibaut and Kelley (1959) maintained that, by nature, humans are selfish. Thus, as a human being, one tends to look out for oneself first and foremost. The theory has three core components: outcome, comparison level and comparison level of alternatives. The idea of weighing up cost versus benefits in the caring trajectory was seen as overly simplified as these relationships are dynamic and work beyond cost versus benefits.

Doctor Jean Watson's Caring Model (1975-1979) begins by defining the major elements of the caring process. Watson defines caring as involving: (a) the carative factors (b) the transpersonal caring relationship and (c) the caring occasion or caring moment. Watson views the "carative factors" as a guide for the core elements of nursing practice. She uses the term "carative" to contrast with conventional medicine's "curative" factors. Her carative factors attempt to "honour the human dimensions of nursing's work and the inner life world and subjective experiences of the people we serve" (Watson, 1997, p. 50). Watson identified 10 initial steps of the caring process, these were later developed into 14 steps (clinical caritas processes) (Watson et al., 1998). The original 10 carative factors were: 1. Formation of a Humanistic-altruistic system of values; 2. Instillation of faith-hope; 3. Cultivation of sensitivity to one's self and to others; 4. Development of a helping-trusting, human caring relationship; 5. Promotion and acceptance of the expression of positive and negative feelings; 6. Systematic use of a creative problem-solving caring process; 7. Promotion of transpersonal teaching-learning; 8. Provision for a supportive, protective, and/or corrective mental, physical, societal, and spiritual environment; 9. Assistance with gratification of human needs; 10. Allowance for existential-phenomenological-spiritual forces (Watson, 1979). Watson further developed her theory (The Theory of Human Caring) with the refinement of these carative factors into clinical caritas processes (Watson, 1979,1988,1994,1997) and the emergence of other aspects including: (1) Expanded views of self and person (transpersonal mind body spirit unity of being; embodied spirit; (2) Caring-Healing Consciousness and intentionality to care and promote healing; (3) Caring consciousness as energy within the human environment field of a caring moment; (4) Phenomenal field/unitary consciousness: unbroken wholeness and connectedness of all.

Watson's theory highlights the uniqueness of the relationship (between nursing professionals and patients) and connection and the need for this to ensure wholeness and harmony. Watson describes the human interaction as sacred and the need to see both parts consciously, as both can benefit from the caring interaction. However, other aspects such as financial activities, household organisation and child rearing may be evident in relationships that are not part of the caring interaction alone. As the focus of this review is on the relationship dynamic between women with breast cancer and their significant other and is not solely focused on caring, the theory was not selected.

Another theory explored in this review was Attribution Theory (Heider, 1958). According to Heider (1958), a person can make two attributions (1) internal attribution: the belief that a person is behaving in a certain way because of something about the person, such as attitude, character or personality (2) External attribution: the belief that a person is behaving a certain way because of something about the situation he or she is in (Heider, 1958). Our attributions are also significantly driven by our emotional and motivational drives. Attribution theory is concerned with how individuals interpret events and how this relates to their thinking and behaviour. The attribution theory assumes that people try to determine why people do what they do (Jones et al., 1972). This theory applies to the search for meaning in human actions. It attempts to explain why humans act in certain ways. While the theory is applicable to relationships in determining why people behave in certain ways as this type of question is not what is posed by the researcher this theory was not chosen.

2.4 The Attachment Theory

Finally, following review of the above theories and models the Attachment Theory (Bowlby, 1969) was chosen for this review as it specifically focuses on intimate relationships within a dyad context and also facilitates the influence of external variables such as the environment. Attachment theory was also chosen as it is has been used extensively in research on relationship processes and outcomes over the past 25 years, has been shown to have wide explanatory power, and has clear relevance for dyadic relationships and health processes (George and Solomon, 1996; Birnbaum et al., 1997; Ciechanowski et al., 2002; Mikulincer and Shaver, 2007). Initial research with Attachment Theory focused on exploring child/maternal bonds however, more recently it has been used to explore adult relationships.

Attachment Theory was originally devised by John Bowlby (1969, 1973) and discussed extensively in the literature (Bretherton, 1992 developmental psychology), (Kirkpatrick and Shaver, 1992 romantic relationships), (Cassidy and Berlin, 1994 child development), (George and Solomon, 1996 caregiving), (Lopez and Brennan, 2000 marriage break-ups), depicts the biological and innate survival tactic of vulnerable parties in seeking security from an identifiable carer or individual (Bowlby, 1969).

John Bowlby initially began his work on attachment theory whilst volunteering in a centre for maladjusted children while attending college. Working in this centre led Bowlby to develop an interest in psychology, specifically child psychology. In an attempt to understand why some children adjust well in life and others do not, Bowlby conducted several experiments. Bowlby's first experiments were of a direct observation design. In his 1944 study Bowlby investigated maladjusted children in a guidance centre. Bowlby compared the relationships of children in the care centre who were deemed "delinquents" with those who were seen as "non-delinquent". Findings showed that a higher percentage of "delinquents" experienced some form of separation from their mother within their first 5 years of life. The delinquent sample found it more difficult to establish and maintain loving, permanent relationships. Bowlby concluded from this, that any degree of separation within the first five years of life, significantly impacts on the child's development.

Bowlby, Ainsworth, Boston and Rosenbluth's study in 1957 explored the effect that a disturbance in the mother-child relationship would have on the child's ability to make relationships. Using observational methodology Bowlby (1957) assessed children and their primary caregiver (mother). The results of the study indicated that prolonged separation of a child from their caregiver resulted in several disturbances to the child's personality. Later Bowlby (1960) investigated grief and mourning in infancy and childhood. With direct observation, Bowlby (1960) categorised the responses that children experience when removed or separated from their mother. Bowlby concluded that the child experiences three phases when separation occurs i.e. Protest, Despair and Detachment.

Attachment Theory attempts to explain human interactions and relationships (Bowlby, 1969). Bowlby (1969) looked at infants and their primary carers, in an attempt to determine the nature of close bonds. Bowlby tried to explain how infants exhibit attachment and understand different attachment styles. In numerous studies Bowlby observed that when children were left with their parent (mother) in a room, the child would freely explore the room. When a stranger entered the room the child would seek out the mother figure and cease to wander around the room. If the child was left alone with the stranger the child would exhibit symptoms of distress e.g. crying, cowering in a corner. These symptoms are explained by Bowlby (1969) as an instinctive reaction to a threat. The term social releaser is used to describe the innate behaviours that the infant exhibits. These social releasers are used to ensure that close proximity to the mother figure is maintained. Bowlby described the presence of a human instinctive attachment bond. He also highlighted the physical, emotional and psychological distress that a threat to this bond can present. Bowlby concluded that the child-mother figure attachment bond is a framework on which all other attachments develop (Bowlby, 1969).

An attachment is defined as a tie or fastening linking one element with another (Bowlby, 1969). Attachment, especially between people, is often positively defined as affection or devotion (Prior and Glaser, 2006) although harmful attachments, for example to a damaging substance or person, can also exist. In the Attachment Theory attachment is seen to be a tie or bond between an individual and an attachment figure. This “attachment bond” that forms is argued to provide security, a sense of safety and protection. For example in children, a secure attachment bond to a caregiver was seen as indicative of the child being able to explore their external environment and feel secure (Bowlby, 1969). Thus, the appropriate development of the attachment bond is seen as essential to cognitive development and social interaction on a wider scale. When the infant begins to crawl or walk they use the attachment figure (familiar person) as a secure base to explore from. The way the caregiver responds leads to the development of styles of attachment. These then lead to internal frameworks which guide the individual's perceptions, emotions, thoughts and expectations in later relationships (Bowlby, 1969). These behaviours evolved because they increase the probability of survival of the child (Bowlby, 1969).

Attachment Theory is seen as evolutionary since it proposes that those who utilise the bond do so in an attempt to survive. Later Bowlby’s (1973) term 'environment of evolutionary adaptedness' (EEA) refers to the environment from which biological systems are evolved. It is suggested that human behaviour involves instincts which can be traced back thousands of years (Bowlby, 1973 p.69). Although the environment in which we as humans now function differs from that of a thousand years ago, Bowlby (1973) argues that the tactics used by humans to survive remain evident in modern society. This environment was one in which humans were predominantly hunter-gatherers and protection from predators and other dangers was best achieved by staying close to a protective adult. It is here that the origins of the attachment bond arose. Pre historically the bond was required as a form of survival tactic to alert the caregiver to the needs of the vulnerable and to ensure longevity, thus the need for an attachment bond as a survival tactic by the child who is threatened, is presented (Bowlby, 1973). The Attachment Theory has several key components, these principle elements will now be described.

2.5 Principles of Attachment Theory

Bowlby (1973) believed that there are four distinguishing characteristics of attachment that people exhibit i.e. (I) Proximity Maintenance: (this is the desire to be near the person with whom one is attached), (II) Safe Haven: (where the vulnerable person will return to the attachment figure for comfort and safety in the face of a fear or threat), (III) Secure Base: (the attachment figure acts as a base of security) and (IV) Separation Distress: (the physical manifestation of anxiety or distress that occurs when the attachment figure is not present). The presence of these characteristics in a relationship supports the existence of an attachment bond. The individual may exhibit some or all of the traits described above (Bowlby, 1973).

With Bowlby's work on Attachment Theory as a guide, other researchers have used the theory in their works. Pietromonaco et al., (2013) developed a framework based on Bowlby's (1969) Attachment Theory. A diagrammatic representation of this framework can be seen in Figure 2.1 (Pietromonaco et al., 2013). Pietromonaco et al., (2013) suggests that a relationship exists between the dyadic processes of relationships and the health processes. The associations between dyadic processes (relationship orientation, relationship behaviours and relationship mediators and outcomes) and health processes (physiology, affective states, health behaviours and health and disease outcomes) are illustrated in Figure 2.1. Attachment style (relationship orientation) can shape dyadic relationships. The dyadic processes include relationship behaviours (i.e. support seeking, caregiving, social negativity) and relationship mediators and outcomes (i.e. partner responsiveness, relationship satisfaction, commitment). Both positive and negative dyadic processes i.e. caregiving, social negativity (as seen in Figure 2.1) are included in the framework due to the distinct effects on health and disease outcomes. In this regard, social negativity (e.g. conflict, insensitivity, dismissiveness), can predict adverse health-related outcomes (Brooks and Dunkel Schetter, 2011). Each partner's dyadic processes can influence, and be influenced by physiological responses, affective states, and health behaviour and health and disease outcomes.

In relation to women with breast cancer the need to feel "secure", "supported" and "intimate" with their partners is well documented (Hagerty-Lingler et al., 2008). These words identified by women with breast cancer are synonymous with terms used in attachment theory. The women's statements are representative of Bowlby's "safe haven" and "secure base" characteristics where the woman with breast cancer returns to her partner for support. Some women also identified the link between poorer support from partners and increased levels of distress, discontentment and depression (separation distress) (Bowlby, 1969). Originally devised for use with partner dyads in a general context, Pietromonaco et al., (2013) also support the use of the framework with "other specialised areas of research (p 501 and 502).

Figure 2.1. Framework of Attachment Theory (Original)

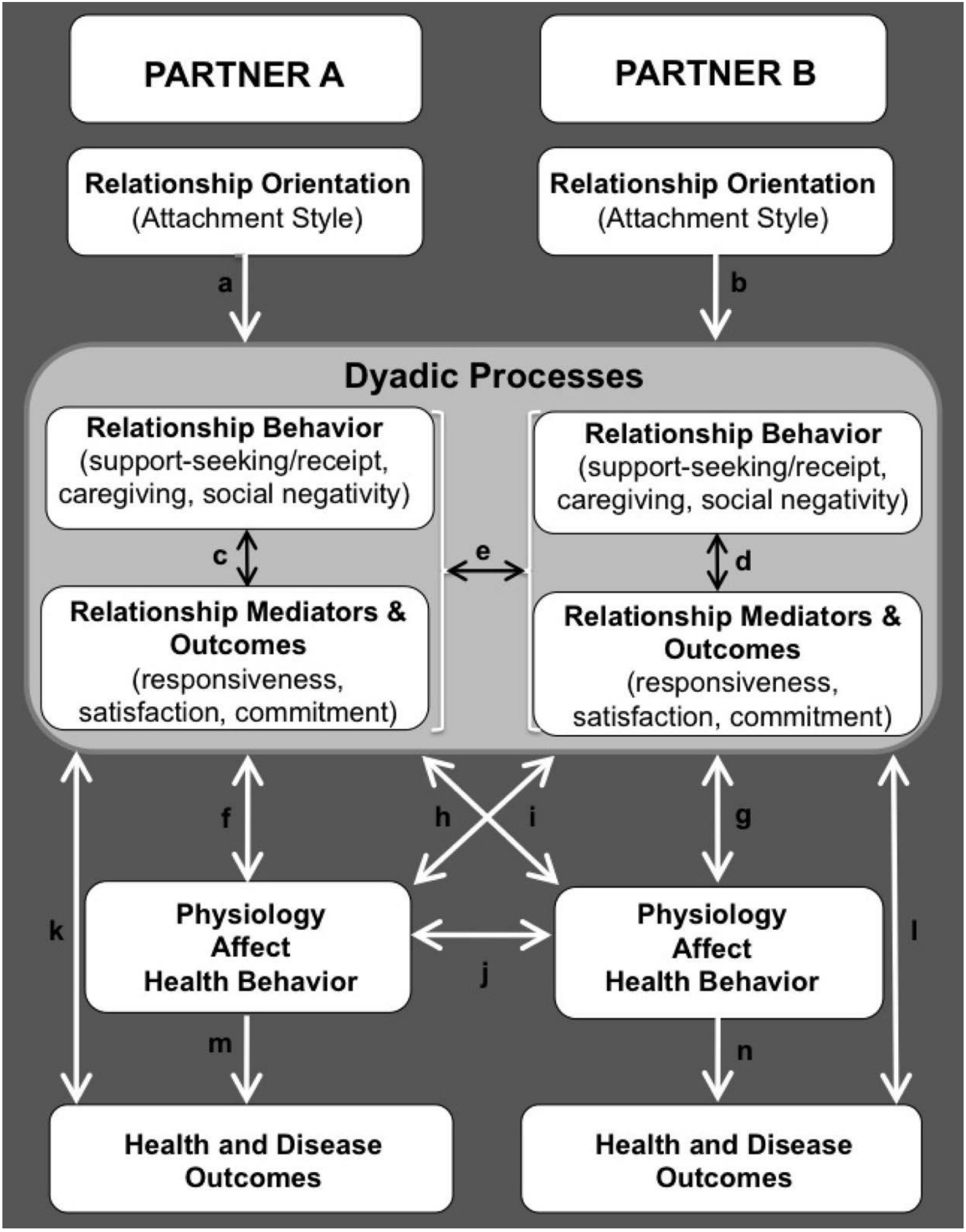


Figure 2.1 Demonstrates Bowlby's (1969) Attachment Theory as depicted by Pietromonaco, P. R., Uchino, B. & Schetter, C. D. (2013) framework. Close Relationship Processes and Health: Implications of Attachment Theory for Health and Disease. Health Psychology, 32, p 499-513 (Replicated with Permission).

The following is a detailed description of each of the elements described in Pietromonaco et al., (2013) (Figure 2.1 and Appendix 4).

2.6 Conceptualisation of Attachment Theory

2.6.1 Relationship Orientation

Relationship orientation is the term used to describe the attachment style of the individual. This according to Bowlby's (1969) classifications can be secure, avoidant, ambivalent or dismissive. The type of attachment style that an individual has is argued to significantly impact on the relationship dyad overall. Those with secure attachment styles will seek to use the dyad to provide security, safety and protection. Individuals with secure attachment styles will demonstrate positive attitudes, behaviours and thought processes, even when presented with negative mediators or outcomes (Pietromonaco et al., 2013). The relationship dyad will be positive whereas avoidant or insecure attachment styles are associated with more negative outcomes (Pietromonaco et al., 2013). The existence of the attachment style is argued by Pietromonaco et al., (2013) as a mental state dealing with the psychological aspects of how the individual forms attachments. In breast cancer, the relationship can be between two individuals: focusing on the woman with breast and her partner (can be spousal or non-spousal) or a constellation of caregivers; here the family members or friends may share the responsibilities of providing care (Usita et al., 2004).

The relationship dyad it not always a couple or partner situation but can involve numerous people; it may be a sibling relationship or non-intimate partner dyad (Hagerty-Lngler et al., 2008). The relationship orientation (attachment style) is evident in situations where multiple caregivers or relationship cohorts exist, in this case however the complexity of the processes (both dyad and health) will increase as there is a greater number of variables, behaviours, attitudes and attachment styles to accommodate. The process of informal caregiving between women with breast cancer and their significant other(s) is reciprocal (Hagerty-Lingler et al., 2008). It involves all parties actively participating in the relationship. In terms of attachment style the dyadic process and the health process as depicted by Pietromonaco et al., (2013) will now be described.

2.6.2 Dyadic Processes

As a dyad involves two parts or individuals, in order to ensure adequate representation of the dyadic processes, research must incorporate a model of explanation of these processes that considers both partners (Pietromonaco et al., 2013). The dyadic process as outlined by Pietromonaco et al., (2013) incorporates the relationship behaviours, the relationship mediators and the relationship outcomes. These will now be detailed.

Relationship Behaviours

As outlined by Pietromonaco et al., (2013), associations between health and relationships can be explained using the attachment theory principles. The dyadic processes include relationship behaviours and relationship mediators and outcomes. Relationship behaviours are those behaviours or acts within the dyad that each individual in the relationship exhibit. Relationship behaviours can be positive or negative. Pietromonaco et al., (2013) presents support seeking/ support receipt, caregiving and social negativity as relationship behaviours. Support seeking behaviour is where a person attempts to locate help or to be cared for. Support receipt refers to the receiving of care. This balance between seeking and receipt is essential in terms of relationships, as many dyads function on the basis of needing and giving assistance when required. Caregiving is the provision of physical, psychological, emotional and social care and support (Hagerty-Lingler et al., 2008).

Social negativity is included as both positive and negative behaviours require consideration (Pietromonaco et al., 2013 p 502). Social negativity is a broad term attributed to any “bad” social attitude or behaviour (Canary et al., 1995; Campo et al., 2009; Butler et al., 2011). Pietromonaco et al., (2013) identifies “conflict and insensitivity” as potential socially negative behaviours (Pietromonaco et al., 2013 p. 502). Social negativity is seen as potentially causing adverse health outcomes due to being associated with a lack of support (Beach et al., 2005; Pietromonaco et al., 2013). Therefore, negative behaviours within the relationship context need to be considered when exploring the dyadic relationship.

In the context of breast cancer, relationship behaviours are those actions that both people in the relationship demonstrate when involved in relationship interactions. This term deals with whether the couple use the dyad to seek support and comfort from each other or whether they have a relationship where both either act independently of each other or act negatively toward one another. Relationship behaviours are diverse and it is expected that alterations exist in behaviours within the dyadic process. The relationship mediators and outcomes as presented by Pietromonaco et al., (2013) are discussed in the next section.

Relationship Mediators and Outcomes

Relationship mediators are external stimuli that affect the relationship. A mediator is defined as a force that attempts to resolve or bring about agreement (Oxford Dictionary, 2012). Mediators can enhance the relationship process. In the context of attachment, mediators relate to elements that influence the relationship and attachment style of the individuals in the relationship such as responsiveness (Pietromonaco et al., 2013). Responsiveness in this context refers to partner responsiveness. Pietromonaco et al., (2013) emphasise the important role of partner responsiveness in relationships. “Partner responsiveness is a key concept in relationship science and refers to individuals’ perceptions that their partners are accepting, understanding, and caring” (Reiss and Shaver, 1988 cited by Pietromonaco et al., 2013 p502).

Relationship outcomes are the results of the relationship (Pietromonaco et al., 2013). This is the effect that behaviours, mediators and attachment styles have on the overall dyadic outcomes. The outcome is the consequence or way something ends up following a set of actions or a certain situation (Pietromonaco et al., 2013). This, in terms of attachment relates to the way the attachment style, behaviours and inner dyadic process affect the outcomes of the relationship. Pietromonaco et al., (2013) refers to examples of relationship outcomes as satisfaction and commitment although others also exist.

Satisfaction is the contentment with something that has been done, given or achieved (Oxford Dictionary, 2012). Pietromonaco et al., (2013) defines relationship satisfaction as a state of contentment with the relationship. This is important when considering the balance of the relationship. Satisfaction cannot be achieved unless both parties are distributing relational aspects in a way that provides both with the necessary requirements to function.

The final outcome depicted in Figure 2.1 is commitment. This refers to loyalty, commitment indicates "a state of being bound emotionally or intellectually to a course of action or to another person or persons" (Pietromonaco et al., 2013 p.502). Individually the core concepts of relationship mediators and outcome are multifaceted, when combined into the dyadic process their intricacy can increase. This is representative of the complex nature of relationships as a whole. The dyadic processes presented above are clear indications of relationship complexities. The health processes will be discussed hereafter with further reference to Figure 2.1.

2.6. Health Processes

As seen in Figure 2.1, physiological response, affective state, health behaviour and health and disease outcomes comprise of the health processes component of the framework. Health processes relate to the internal and external health relatable areas that can affect the dyadic processes (Pietromonaco et al., 2013). Health processes are intrinsically linked with the dyadic processes, for example a supportive person (relationship behaviour), who has a responsive partner (mediator) may associate a higher level of satisfaction with their relationship (outcome) and as a result may experience less depression (affective state), less stress (physiological), participate in more physical activity (health behaviour) and as a result experience fewer negative health outcomes. The link between physiological responses and affective states is clearly depicted by Pietromonaco et al., (2013) with the use of arrows indicating the direction of influence. Each of the components of the health process will now be described.

Physiological Responses

Physiology refers to the inner functions of the body. In terms of attachment style the physiological responses that relationship orientations and the dyadic processes can bring is relevant to the current study. Pietromonaco et al., (2013) highlight that the physiological responses are affected by the dyadic processes (relationship behaviours, mediator and outcomes), however the two way direction of the arrow illustrates how physiology can also affect the mediators, outcomes and behaviours (Figure 2.1). It is proposed that increases in stress (physiological) can result in increased depressive symptoms/low mood (affective state), lower satisfaction (outcome), a less responsive partner (mediator), a less supportive individual (behaviour) (Pietromonaco et al., 2013). While Figure 2.1 does not present any examples of physiological responses, these can be surmised as including stress, distress, nervousness etc. (Hagerty-Lingler et al., 2008).

Affective States

Affective states are essentially the moods or feelings of individuals (Brooks and Dunkel Schetter, 2011). Literature has presented links between affective states and health outcomes (Blanchard, Courneya and Laing, 2001; Brooks and Dunkel Schetter, 2011). A person who is in a poorer functioning relationship may be more prone to low mood or depression (Brooks et al., 2011). Depression has been associated with a higher number of physical ailments (Northouse et al., 2005; Kim et al., 2007) and poorer quality of life (Bergelt el at., 2008).

Health Behaviours

Health behaviours include personal decisions that have a direct resulting impact on our health as a whole (WHO, 2013). Some of these include low levels of physical activity, smoking, excessive alcohol consumption and poor nutrition. In terms of Attachment Theory it is proposed by Pietromonaco et al., (2013) that health behaviours can affect and are affected by the mediators, outcomes and relationship behaviours. It is apparent that the relationship as illustrated by Figure 2.1 (Pietromonaco et al., 2013) is not one way but instead encompasses a variety of pathways (Figure 2.1), each pathway is represented by arrows and different letters (a-n). For example the health behaviour of smoking has been linked with increased incidence of stroke (disease) and hypertension (condition), as a result the quality of life of the individual can be affected and overall health status decreased (health) (Carver et al., 1998).

2.6.4 Health and Disease Outcomes

According to Pietromonaco et al., (2013) the individuals' attachment style and dyadic process are considered to influence the health process. The health process incorporates both health and disease as a holistic definition of "health" is required to encompass both health and disease aspects. Health can relate to the level of physical, psychological, emotional or social wellbeing. Disease is considered to be affected by attachment styles, the dyadic process and health behaviour. A positive attachment style or relationship orientation is seen to result in less disease comorbidities (Pietromonaco et al., 2013).

Pietromonaco et al's., (2013) prototype framework does not specify nationality, gender and age categories, however the idea that differences may need to be accounted for in terms of socio-demographic criteria is alluded to. This framework based on Bowlby's

(1969) Attachment Theory is complex. A discussion on the application of Attachment Theory to the mother-child context will now be presented.

2.7 Application of Attachment Theory to Mother-Child Relationships

In terms of the mother-child interaction, pre-attachment behaviours were found to occur in the first six months of life (Bowlby, 1969). These behaviours such as the infant's smile, babble, and cry aim to attract the attention of the potential caregiver. Although infants are able to distinguish the primary carer at this initial phase, these behaviours are generally directed at any individual within the first few weeks. In the second phase (2-6 months) the infant specifically addresses the behaviours to one caregiver. Attachment behaviours in this phase included following and clinging. It was found (in Ainsworth, 1967 and Bowlby, 1973), that the child would cry and exhibit physical symptoms of distress when feeling insecure, unsafe or unprotected. In seeking comfort from the mother, the child's physical symptoms would decrease indicating a sense of safety, security and protection. This bond can be seen to be extremely important to the child's welfare and development. A child's level of vulnerability is significantly greater than that of an adult. In this relationship the "attachment bond" is one sided and only applies to the child. The child has formed attachment to the parent. The child requires the parent to respond to its needs instinctively. It is important to note that the "attachment bond" is not synonymous with the child's love for the parent. It is a survival mechanism to ensure longevity.

While initially developed by Bowlby, the attachment theory has been widely studied and developed (Ainsworth and Wittig, 1969; Ainsworth and Bell, 1970, Ainsworth, 1978, Ahnert, Gunner, Lamb and Barthel, 2004, Behrens, Mains and Hesse, 2007). Bowlby's theory is now used extensively in psychology and in the understanding of child development. Its uses in mental health are also evident with studies involving the attachment theory published widely (Goodwin, 2003; Ma, 2006; Berry and Drake, 2010).

Psychologists such as Mary Ainsworth further expanded on Bowlby's work throughout the 1970's. Studying children (from 100 families) between the ages of 12 to 18 months, Ainsworth and colleagues placed the children in a situation where they were briefly left alone and then reunited with their mother (Ainsworth and Bell, 1970; Ainsworth, 1971). The experiment was conducted in a small room where the researcher observed the participants via a one way glass system. Toys and entertaining objects were provided in the room in an attempt to make the room more appealing. In the study "Strange Situations" Ainsworth and Bell (1970) presented three types of attachment styles: secure attachment, ambivalent-insecure attachment, and avoidant-insecure attachment. The findings indicated that most children demonstrated secure attachment styles.

Securely attached infants will freely explore their environment if the caregiver is present, typically engages with strangers, and are often upset when the caregiver departs while happy to see the caregiver return. Ainsworth (1978) linked secure attachment with parents who consistently (or almost always) respond to their child's needs. Such children are certain that their parents will respond whenever they feel insecure. Thus, the parent forms a secure base for the child. Anxious-resistant insecure attachment is also called ambivalent attachment. Children with an anxious-resistant attachment style will explore less (in the Strange Situation) and are often wary of strangers, even in the presence of the caregiver (parent). When the mother leaves the room, the child becomes upset (cries, crawls to door). When the parent returns, the child acts ambivalent (Ainsworth, 1978). A child with an anxious-avoidant attachment style will avoid or ignore the parent when he or she returns (Ainsworth, 1978). These infants are often seen as demonstrating a mixture of both avoidance and resistance. The child shows no favor to the parent over the stranger. This attachment style can be caused from little or no interaction between the parent and the child during infancy and early childhood.

Researchers Main and Solomon (1990) added to the theory with a fourth attachment style known as “disorganized-insecure attachment”. This style can be defined as the lack of an 'organised' strategy for dealing with stresses (i.e. the strange room, the stranger, and the comings and goings of the caregiver). Evidence from Main and Solomon (1990) suggests that children with disorganized attachment may experience their caregivers as frightening or frightened. A frightened caregiver is alarming to the child, who uses the caregivers’ response to situations as a guide to know how to act themselves. An intimidating caregiver is usually aggressive towards the child and puts the child in a dilemma which Main and colleagues refer to as being harmful to the child’s development. In other words, the caregiver is both a source of alarm and safety for the child. This can provide the child with an internal dilemma as the item of fear is also the person of comfort.

Interactions witnessed by the child are seen as erratic, and so the child cannot form an organized template for interactions. Other studies have supported Ainsworth's conclusions and additional research has revealed that these early attachment styles can help predict behaviours in later life (Berry, Gunn and Andrews, 1980 (individuals with Down syndrome), Thompson and Lamb, 1984 (emotional responsiveness in infants), Bridges, Connell and Belsky, 1988 (infant-father situations), Braungart and Stifter, 1991 (infants), Nakagawa, Lamb and Miyaki, 1992 (Japanese infants).

In relation to validation of the Strange Situation (Ainsworth, 1978), a meta-analysis of 2,000 infant-parent dyads, including several studies with non-Western language and/or cultural bases, attachment classifications depicted by Ainsworth (1978) were found to be globally distributed (Van Ijzendoorn and Kroonenberg, 1988). Various countries, including Japan, Israel, Germany, China, the UK and the USA were included in the study using the Strange Situation (Ainsworth, 1978) study as a template. The research showed that though cultural differences existed, the four styles, secure, avoidant, ambivalent, and disorganized were evident within the studies regardless of the country of origin. This supports the rationale that attachment theory is innate which allows infants to adapt to their environment. It is not specific to country, origin, ethnicity or gender. These global distributions were consistent with Ainsworth et al.'s (1978) original attachment classification. It is important to note that while attachment style may influence a relationship, other factors such as temperament, environment, health status and life experiences also impact on relationships (Main and Solomon, 1990; Target et al., 2003).

Later a study by Jin, Jacobvitz, Hazen, and Jung (2012) in Korea explored if mother-infant attachment relationships are culture-specific. The results of the study were compared to a national sample and showed that the four attachment patterns of secure, avoidance, ambivalent, and disorganized, existed in Korea. These attachment styles were already seen as being applicable to the other cultures as demonstrated in the above study by Van Ijzendoorn et al., (1988).

In summary, the application of Attachment Theory to the mother child context has been widely researched as apparent from the above studies. Maternal-child relationships are seen to severely impact on the child’s psychological and developmental health. More recently researchers have begun using Attachment Theory to explain adult relationships. The application of Bowlby’s attachment theory to the adult context will now be discussed.

2.8 Application of Attachment Theory to the Adult Context

Although initially used with infant caregiver bonds, the theory is applicable to relationship dynamics across the life span. This theory may provide interesting insights into adult relationship bonds, in the context of breast cancer. Early research focused on classifying attachment styles and linking attachment style to coping or symptom experience (Vetere and Meyers, 2002; Abdul Kadir et al., 2013). Other research has evolved to investigate how attachment style influences coping and adjustment to chronic conditions (Schmidt et al., 2002; Randall et al., 2012). While adult interactions may differ from the mother-child relationship, when presented with a threat, adults may also seek security and protection. Adult relationships may use the attachment bond to feel safe and secure when a threat is present. Adult interactions may be seen as a two way system of this attachment bond, whereby at different stages different partners would require comforting and the provision of security, safety and protection from their partner.

Thus, in adult relationships the "attachment bond" can work in both ways and be utilised by both parties. In a child's attachment the primary caregiver's sensitivity to the needs of the child are essential to survival of the child. The caregivers need to meet the child's needs is one of the main reasons why the "attachment bond exist". Following the review of the theoretical literature, it can be surmised that adult partner dyads also display the need to maintain sensitivity to each other's needs.

Throughout the 1980s, the theory was extended to involve attachment bonds in adults. A variety of adult interactions were seen to exhibit attachment behaviour. These include peer relationships at all ages, romantic and sexual attraction, and responses to the care needs of infants or the infirmed and elderly. It is believed that those who do not experience secure attachment may develop sensitivity to rejection in later life (Bowlby, 1973).

A study by Vetere and Myers (2002) aimed to explore whether individuals who possess a repressive coping style exhibit an avoidant attachment style. Conducted within the context of romantic relationships the study used (1) the Marlowe–Crowne Social Desirability Scale (MC) and (2) the Bendig version of the Taylor Manifest Anxiety (MAS) scale (Bendig, 1956). Two measures of romantic adult attachment were used: a categorical measure devised by Hazan and Shaver (1987) and a dimensional measure the Romantic Adult Attachment Style Questionnaire (RAASQ) devised by Simpson (1990). Those who demonstrated repressive coping styles scored significantly higher on the avoidant attachment scale of the RAASQ. The results indicate that individuals with repressive coping styles, reported higher levels of romantic avoidant attachment than non-repressors. These findings identified a potential link between repressive coping and adult attachment style.

Similar results were demonstrated in a study by Schmidt et al., (2002). This study used the attachment theory (Bowlby, 1969) as a framework to identify coping strategies in the context of chronic disease. One hundred and fifty patients were investigated using the adult attachment interview (AAPR coding system) and a coping interview (Bernese Coping Modes). Self-reported coping modes, social support, the subjective health status and the quality of life, were also assessed by self-report measures at two or more sampling points. The sample (n= 150) of patients in the study were suffering from (a) breast cancer (n=54), (b) chronic leg ulcers (n=52) and (c) female alopecia (n= 44). Findings indicated a moderate effect of attachment styles on coping strategies. Insecure attachment was related to less flexible coping. Coping strategies also differed across the different attachment styles. Researchers noted that ambivalently attached individuals showed more negative emotional coping while avoidant attached individuals showed more diverting strategies. Schmidt et al., (2002) concluded that two levels of coping should be considered. It is suggested that secure attachment might be considered to be an important inner stimulus in the emotional adaptation to chronic disease. As breast cancer itself is viewed as a chronic condition as defined by the above study, applying the attachment theory to the proposed study seems appropriate.

Similarly, Davies et al., (2009) performed a cross-sectional study on a large population-based sample (n=2,509) to investigate whether, compared to pain free individuals (n= 1,006), participants with chronic widespread pain (n=462) or other pain (n=1,041), were more likely to report insecure adult attachment styles. Participants completed a self-rated assessment of adult attachment style which was categorized as secure (i.e. normal attachment style) or insecure (preoccupied, dismissing or fearful). The sample rated their pain intensity and pain-related disability on an 11 point Likert scale. These groups were identified i.e. those who were pain free, had chronic pain and those who had other pain. Individuals with chronic widespread pain (CWP) were more likely to report a preoccupied, dismissing or fearful attachment style than those free of pain. Among individuals with chronic widespread pain, insecure attachment style was associated with the number of pain sites. These findings suggest that treatment strategies based on knowledge of attachment style, possibly using support and education, may alleviate distress and disability in people at risk of, or affected by, chronic widespread pain. This study demonstrates that individuals with "insecure" adult attachment styles are shown to experience more pain than people with secure attachment. The results of Davies et al's., study (2009) support the visible effects that attachment styles have on the overall symptom experience. This correlates with Pietromonaco et al., (2013) depiction of Attachment Theory, which identifies a link between dyadic processes and health processes.

Another study by Cairo Notari et al., (2013) examined the association between treatment-related physical symptoms of breast cancer, anxious or avoidant attachment, and psychological distress in women. This study was part of a larger project on the role of social support in women facing cancer. Women (n=72) were recruited during hospitalization. Their mean age was 53.7 years. After surgery, women completed a questionnaire with the following self-reported scales: the European Organization for Research and Treatment of Cancer (EORTC-QLQ BR23) for physical symptoms scale; the Experiences in Close Relationships-revised (ECR-R) for adult attachment scale; and the Brief Symptoms Inventory (BSI-18) for psychological distress scale. The findings showed that anxiety was a direct predictor of distress. Avoidant attachment was seen as having a moderating effect on the relationship between physical symptoms and distress. Physical symptoms, anxious attachment style and neo-adjuvant treatment were all identified as predictors of distress.

This study shows that attachment style plays a role in adjustment to breast cancer (Cairo Notari et al., 2013). These results demonstrate that women's response to stress is not only determined by the disease but also by their way of regulating emotions which is a trait of their personality. Interventions aiming at helping women to cope with breast cancer should take into account individual variability in emotion regulation and relationship characteristics, if they are to be more efficient. The findings of this study support further research into the use of attachment theory in the breast cancer context.

In summary, establishing secure attachments is seen as occurring in an infant phase, however relationships in later life can be affected by our infant bonds (Bowlby, 1969; Vetere et al., 2002; Reblin et al., 2008). In addition, adult attachment styles have the potential to impact on various health outcomes e.g. coping styles (Schmidt et al., 2002), level of pain (Davies et al., 2009) and level of psychological distress (Cairo Notari et al., 2013). Investigating the dyadic elements of the relationship between women with breast cancer and their significant other will allow healthcare professionals to target their care to meet the needs of these women and their identified significant other. In addition, exploring whether the relationships that women with breast cancer developed as children impact on their current relationship, may be beneficial to the future care provision for women with breast cancer. The process of informal caring is widely visible in breast cancer. Many caregivers are related to the woman with breast cancer. This, combined with the identified effect breast cancer has on the relationship between the women and their significant other, suggests that investigating this relationship is worthwhile.

Breast cancer can be viewed as a threat to one's security. The adult relationship may use the "attachment bond" to deal with this threat. The theory is also easily adaptable to viewing both women with breast cancer and their significant other(s)/ support person as a dyad. Use of the attachment theory to explore the dimensions of the relationship that the woman with breast cancer and their caregiver share, may identify ways of integrating these other factors within the attachment theory as a framework. The theory may be useful in exploring the attachment bond that women with breast form with their significant other. Using the theory to determine if a link between successful attachment bonds and better adjustment to breast cancer diagnosis exist, may provide insight into this dyad. Application of this theory to women with breast cancer and their identified significant other will now be discussed.

2.9 Application of Attachment Theory to Women with Breast Cancer and their Significant Other Context

The properties of attachment theory and the mechanism by which it attempts to understand one's attachment to another was seen as applicable to the current study. Pietromonaco et al., (2013) describe attachment theory and link it with dyadic relationships. Using a framework (Figure 2.1) devised from Bowlby's attachment theory Pietromonaco et al., (2013) discuss the application of the theory for research in several health domains (e.g. self-regulation of health behaviour, pain, chronic disease) and its implications for interventions and future research. Their results revealed important gaps in knowledge about relationships and health. They concluded from the use of the framework that application of the attachment theory to health related issues can benefit from further research. A theoretical framework for studying health that is based on relationship science can accelerate progress by generating new research directions designed to pinpoint areas through which close relationships promote or undermine health. Furthermore, this knowledge can develop more effective interventions to help individuals and their partners cope with health related challenges (Tacon et al., 2001; Hagerty-Lingler et al., 2008; Ward et al., 2009; Badr, 2010).

This review of the literature revealed the importance of studying close relationships more thoroughly, it demonstrated the relevance that relationships have to health throughout the life span and to health related topics such as: pregnancy and birth, adjustment to chronic disease, caregiving, and depression. Several themes were identified by Pietromonaco et al., (2013) as relevant. Firstly, the dyadic relationship is critical to health, especially in relation to close relationships such as those with a marital partner. Secondly, it is important for future studies of couples in health/illness situations to consider both partners and not only perceptions of one of the individuals in the couple. Third, relationship science theories can possess value and give meaning to the study of health over the life span. Theoretical perspectives, including the attachment theory provide insightful avenues in terms of the application of health psychology to the study of close relationships.

Summary

In summary, while primarily developed within the mother-child relationship context, the attachment theory has been applied to the adult relationship context. Within the adult context, attachment theory has also been used to explore intimate relationships, addiction as well as psychological ailments. Further developments have resulted in the theory being used in the chronic illness context. The attachment theory appears to have certain elements which make it suitable for the purpose of studying women with breast cancer and their significant others. It has continued to develop and evolve ensuring its applications are valid in today's context. It has been elaborated on to include numerous instruments to provide measurable data and it has principles which appear relevant to the context of breast cancer and relationships, with minor adjustments required.

An overview of the attachment theory; including its principles, advances to the theoretical framework, its uses in research and how it could be applied to the proposed study, have been presented in this chapter. The empirical measurement of Attachment style is possible allowing for the linkage of attachment style to other variables (relationship process, health outcomes). In this regard, the empirical literature pertinent to women with breast cancer and their significant others will be reviewed, using Bowlby's Theory as interpreted by Pietromonaco et al's., (2013) as a framework, in the following chapter.

Chapter III The Informal Supportive Relationships of Women with Breast Cancer: A Literature Review

Introduction

A diagnosis of breast cancer and the associated treatments places an increased burden on women with breast cancer and their significant other (Hagerty-Lingler et al., 2008). Informal caregivers, such as partners, close family members, or friends provide essential support to women with breast cancer along the disease trajectory. These individuals may offer practical support by accompanying the woman to hospital and also psychological support to help the women cope with the uncertainty and fear. In some phases of the illness where the woman is lethargic from treatments, caregivers may provide assistance with physical activities along with giving emotional support. In most cases, the support person is a spouse or partner (Lethborg, Kissane and Burns, 2003; Lewis, Fletcher, Cochrane and Fann, 2008). However, the significant other can also be a child, parent, sibling or friend (Pinkert, Holtgrawe and Remmers, 2013). While the concept of caregiver burden is evident in the literature (Nikoletti, Kristjanson, Tataryn, McPhee and Burt, 2003), less research focuses on the impact that dyadic processes can have on health outcomes for women with breast cancer and their significant other(s). Therefore, a review of the literature was conducted to explore the impact of supportive relationships in the context of breast cancer on both the woman with breast cancer and their significant other.

The themes identified in the literature are discussed using the key principles of Attachment Theory (Bowlby, 1969) as interpreted by Pietromonaco et al., (2013) as a framework (Appendix 4).

3.1 Aim

The aim of the review was to source and discuss the empirical literature on the informal supportive relationships of women with breast cancer i.e. care provided by a non-professional source and their significant other. The objectives were:

(1) To establish what is already known about women with breast cancer and the informal care they receive.

(2) To determine what is known regarding the supportive relationships between women with breast cancer and their significant other(s).

3.2 Methodology of Review

3.2.1 Search strategy

The author searched several databases including PubMed, CINAHL, Medline, Embase, Cochrane, Web of Knowledge, Scopus and Psych Info (Appendix 5). The keywords cancer, support, relative, breast and patient were arranged according to the PICOT framework (Schardt, Adams, Owens, Keitz and Fontelo, 2007) i.e. Population, Intervention, Comparison, Outcome, and Timeframe (Appendix 6). Appropriate synonyms were adopted for these keywords to enhance the overall results. MeSH terms were also identified (Appendix 5). The search was limited to papers published between January 2000 and January 2014 (Appendix 5, 6 and 7).

The inclusion criteria were papers that:

- Focused on the woman-significant other dyad or patient-partner dyads within a breast cancer context
- Focused on relationships in breast cancer
- Focused on informal caring within breast cancer
- Referred to support in breast cancer

The exclusion criteria were papers that:

- Discussed treatment or regimens
- Focused on healthcare professionals
- Focused on other cancers but not breast cancer

The search identified a total of five hundred and forty one papers. Of these one hundred and seventeen were duplicates and were subtracted from the count, leaving four hundred and twenty four papers. Papers relating to palliative or hospice care were disregarded as the focus was not on specialist palliative care services or hospice settings (Figure 3.1). Papers focusing on treatments or support from healthcare professionals were also discounted from the review, since the review was more concerned with women with breast cancer and their significant other. A review of the title/abstract by the author as well as the reference lists from the chosen papers were also reviewed to identify any further studies (Aveyard, 2007). In addition forward citation of relevant papers was used to source more recent publications. Notifications from the databases were set up and maintained to ensure relevant data would be forwarded to the author. Papers that focused on the patient or relative or both were deemed suitable for the study and were included.

Finally, a total of forty nine papers were found to be applicable (Figure 3.1). Details of papers identified in the review containing authors, design of study, sample group and findings are outlined in Appendix 8a. Fourteen papers focused on women with breast cancer, while sixteen papers focused on the relative (either spouse or other carer). One was from the perspective of nurses and relatives and seventeen considered the perspectives of both the significant other and the woman with breast cancer together. The forty nine papers were a combination of qualitative (n=15) and quantitative (n=26) design, with two using a mixed method approach and randomised clinical trials (n=6)

(Appendix 8a and 8b). The majority of studies were conducted in America (n=30). The remaining took place in Israel (n=3), Australia (n=2), Germany (n=2), Japan (n=2), Taiwan (n=2), Belgium (n=1), Canada (n=1), France (n=1), Italy (n=1), Iran (n=1), United Kingdom (n=1), Switzerland (n=1) and The Netherlands (n=1). The key concepts of attachment theory (as depicted by Pietromonaco et al., 2013) will be used as a framework to present the review of the literature.

3.2.2 Methods Used to Appraise Studies

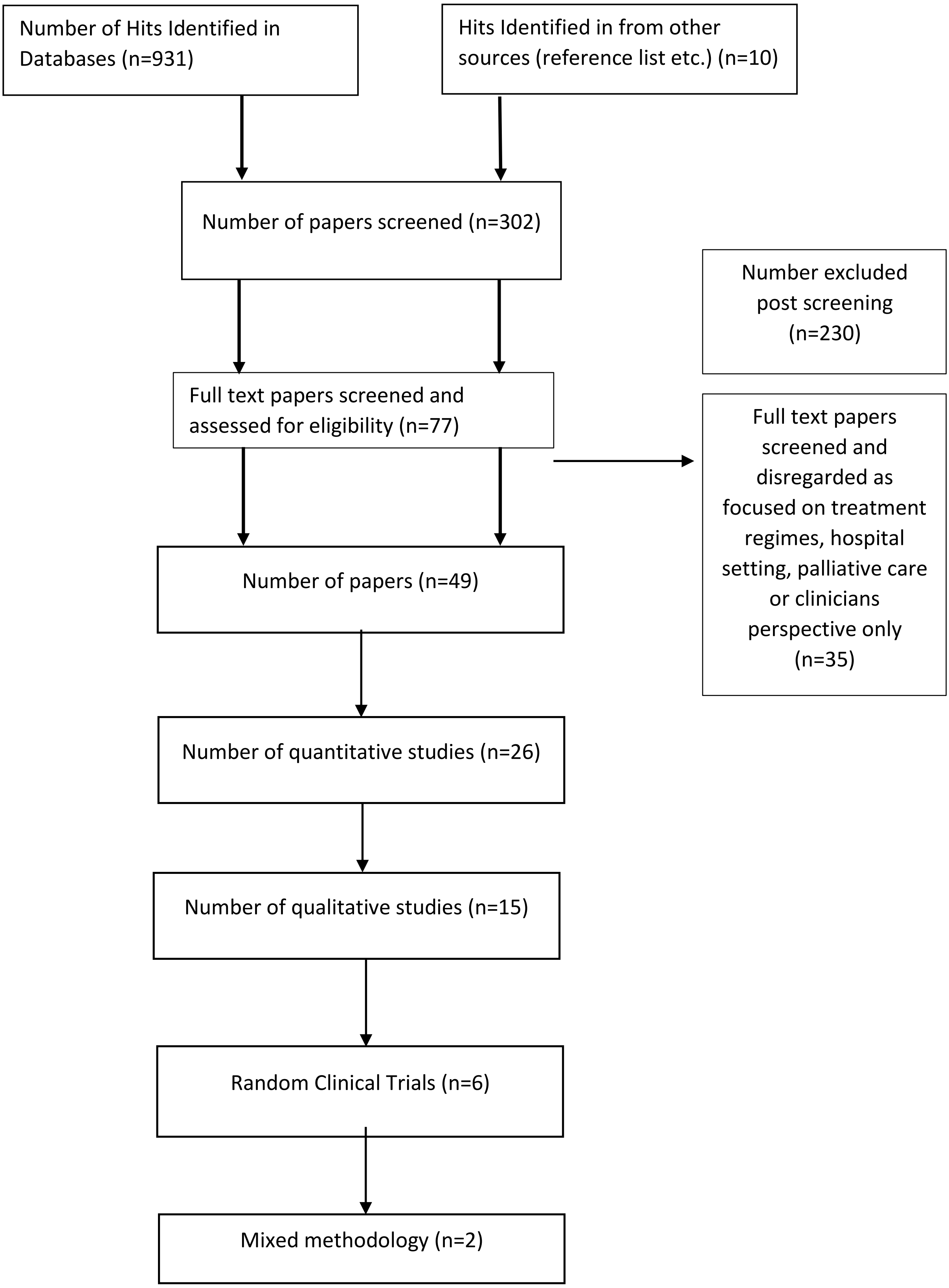
In order to ensure that the highest quality of papers was included in this review, an appraisal tool was used. Several tools were identified; these are reviewed in Appendix 9. The Standard Quality Assessment Criteria for Evaluating Primary Research Checklists for Quantitative and Qualitative Papers or QualSyst Appraisal Tool (Appendix 10) was deemed most suitable to this review. This tool allows for evaluation of both types (quantitative and qualitative) of methodology and facilitates a grading system that scores each paper (Kmet, Lee and Cook, 2004). The tool is also practical for use with Meta and Systematic analyses which were identified in the literature.

The tool consists of a 10 item checklist for qualitative papers and 14 item checklist for quantitative papers, with items scored as a 2 for yes, 1 for partial yes and 0 for no. The total for each paper is obtained through adding up of the scores for each item. Thus, each paper receives a total score out of 20 for qualitative papers and out of 28 for quantitative papers. Both the qualitative and quantitative checklists were used to assess studies of mixed methodology. The author carried out the initial assessment/screening process of the papers using the QualSyst tool. The papers and assessment tool were then given to two academic peers for review. Following the application of the appraisal tool 4 papers were removed as they scored below the acceptable 10/20 (qualitative) or 14/28 (quantitative) score.

3.3 Review of Literature Using Attachment Theory as a Framework

The following is a review of the literature, using themes identified in Bowlby's (1969) Attachment Theory as interpreted by Pietromonaco et al., (2013) as a framework (Figure 2.1). These themes are categorised under the headings of relationship orientation (i.e. attachment style), dyadic processes (i.e. relationship behaviours, relationship mediators and relationship outcomes) and health processes (i.e. physiological responses, health behaviours, affective states) and health and disease outcomes. The interdependent nature of relationships in the breast cancer context, suggests that viewing the woman and her significant other as a dyad may be worthwhile (Regan et al., 2012). Therefore, a review of the literature on women with breast cancer and the support they receive from others throughout the disease trajectory is presented.

Figure 3.1 PRISMA Application to Hits Achieved



3.4 Relationship Orientation

Relationship orientation is the first theme described by Pietromonaco et al., (2013). Pietromonaco et al., (2013) describes relationship orientation as relating to the "attachment style" that each individual in the relationship exhibits, i.e. secure, preoccupied, fearful, and dismissive. This is the way that each individual forms their attachment to another. In terms of rating the relationship orientations, secure styles are seen to be more positive than avoidant, ambivalent and dismissive. Pietromonaco et al., (2013) suggests that Partner A's attachment style may affect Partner B's relationship mediators and outcomes and vice versa; Partner B's attachment style may affect Partner A's physiological responses, affective state, and health behaviour.

Secure relationship orientations are seen to be indicative of more positive relationships. Studies on women with breast cancer and their significant others have identified the unique aspect of the couple's relationship and its linkage to the attachment styles of the individuals in the relationship (Dorros et al., 2010; Fagundes et al., 2014; Hsiao et al., 2014; Lim, 2014). It is asserted that those dyads which have better attachment styles (i.e. relationship orientations) have better overall functioning relationships (Fagundes et al., 2014; Lim, 2014). Women with breast cancer and their significant other who report a poorer relationship style have been found to be at a higher risk of maladjustment and psychological morbidity (Gale et al., 2001). This quantitative study investigated whether the existence of a cohabiting relationship was associated with psychological distress in women facing an acute health threat. Support and self-esteem were tested as predictors of distress. Women (n=158) with symptomatic breast problems who were referred to a diagnostic breast clinic participated in the study. Levels of psychological distress (stress, anxiety and depression), social support, and self-esteem and quality of partner relationship for women with partners, were measured using standardized self-report instruments. Women in low quality relationships experienced significantly more distress and received less support than women in high quality relationships. Social self-esteem and ideal social support were also found to be significant predictors of distress for women without partners and cohabiting women in low quality relationships. It would appear that women with breast cancer who report poor quality spousal relationships are at a higher risk of elevated psychological morbidity.

Women stated that the “secure” feeling of being safe impacted on how they dealt with the breast cancer diagnosis (Gale et al., 2001). Feelings of depression, security and safety have been linked with psychological adjustment and mental health status (Ben-Zur, Gilbar and Lev, 2001; Feldman and Broussard, 2005). The quality of the woman’s life is dependent on how well her relationships (whether intimate or social) provide for her needs (Manne et al., 2004; Wimberly et al., 2005). Secure relationships will give rise to more positive outcomes whereas the opposite can be seen for avoidant or dismissive relationships (Hsiao et al., 2014).

Similarly, Korziinska (2012) explored the association between attachment style and health and life satisfaction in their quantitative correlational study. This sample consisted of two groups: the study group (n=128 women with breast cancer) and the control group (n=112 women without any psychiatric or serious somatic illness). The Relationship Questionnaire, Physical Disposition Scale, Subjective Health Scale and The Satisfaction with Life Scale were used. Results demonstrated that in terms of the women with breast cancer as opposed to the control group: 1) insecure attachment was more frequent, 2) ratings of physical wellbeing and subjective health were positively correlated to relationship style 3) subjective health and life satisfaction were highest in women with secure attachment, regardless of the presence or absence of breast cancer.

Fagundes et al., (2014) explored attachment style and its influences on women with breast cancer and their quality of life outcomes. This study examined how individual differences in attachment style and self-regulatory capacity (as indexed by respiratory sinus arrhythmia (RSA)) were associated with the quality of life (QOL) of breast cancer survivors following surgery. Women (n=96) who had completed treatment for stage 0-IIIA breast cancer within the past 2 years participated in the study. RSA was assessed using electrocardiography data collected for 10 minutes. Relationship orientation (Attachment style) was measured using a modified version of the Experiences in Close Relationships Scale. QOL was measured with the Functional Assessment of Cancer Therapy-Breast scale. Findings of the study indicated that women with more attachment anxiety reported poorer QOL than those with less attachment anxiety. Women who indicated avoidant attachment style reported poorer QOL compared with those who were less avoidantly attached. The study concluded that a relationship existed between attachment style and QOL. A better QOL is associated with a more positive attachment style (relationship orientation).

A similar study by Hsiao et al., (2014) explored whether stress, depression, anxiety, sleep disturbances, insecure attachment and meaning in life were predictors of diurnal cortisol patterns in breast cancer survivors and their spouses (n=34 dyads). In this eight-month follow-up study participants completed the Medical Outcomes Study Sleep scale, the Beck Depression Inventory-II, the State Trait Anxiety Inventory, the Experiences in Close Relationships-Revised scale and the Meaning in Life Questionnaire. Diurnal cortisol was assessed using saliva samples obtained at seven time points throughout the day. For spouses, psychophysiological stress responses were mainly influenced by breast cancer survivors' insecure attachment. The findings of this study demonstrated that cortisol levels, associated with fight/flight response are associated with attachment style.

In summary, the findings of the studies reviewed reveal that attachment style is an important element of relationships that needs to be considered for a number of reasons. Firstly, poorer attachment styles have been linked to a higher risk of psychological morbidity (Gale et al, 2001). Secondly, there is a linkage between secure relationships and higher levels of life satisfaction and health status (Korziinska, 2012). Thirdly, secure relationships are associated more positive health outcomes (Fagundes et al., 2014). In addition, anxiety and stress are associated with more insecure relationships (Hsiao et al., 2014). Lastly, a poorer overall quality of life was noted in individuals with poorer attachment styles (Fagundes et al., 2014). Relationship orientation or attachment style influences dyadic functioning. While each individual involved in the relationship will have their own attachment style, developed from differing circumstances and experiences in their lives, these styles overall affect how both parties deal with aspects of the relationship including problems, difficult situations and challenges (Pietromonaco et al., 2013). In the following section the dyadic processes will be discussed using the headings depicted in Pietromonaco et al's., (2013) framework (Figure 2.1).

3.5 Dyadic Processes

The dyadic process as defined by Pietromonaco et al., (2013) deals with the processes that relate to the relationship itself. Dyadic processes include both relationship behaviours (support, caregiving, social negativity) and relationship mediators and outcomes (stress, anxiety, depression, responsiveness) (Figure 2.1). A dyad is defined as two elements or components that share a certain relationship or proximity (Hagerty-Lingler et al., 2008). In Sociology, it relates to a group of two people or a pair (Pietromonaco et al., 2013). Throughout this discussion "a dyad" refers to the woman with breast cancer and the important individual in her life i.e. the person to whom she feels closest. Its deals with what type of relationship is present, the behaviours that the individuals exhibit and how these affect the relationship overall. This will be elaborated on using the headings of relationship orientation (attachment style-previously discussed), relationship behaviour (encompassing support seeking/ support receipt, caregiving and social negativity), relationship mediators (responsiveness) and relationship outcomes (satisfaction and commitment) as defined by Pietromonaco et al., (2013). The concepts of relationship behaviours are presented below.

3.5.1 Relationship Behaviours

The main relationship behaviours identified in the literature review can be classified using the headings depicted in Pietromonaco et al's., (2013) Attachment Theory Diagram (Pietromonaco et al., (2013) (Figure 2.1) i.e. support seeking/ support receipt, caregiving and social negativity. These behaviours have been identified by both women with breast cancer and their significant others as behaviours existing within the relationship. These relationship behaviours will now be discussed.

Support Seeking/Support Receipt

Support is a broad concept that is both complex and often individualistic. Support is the provision of aid to overcome challenges or problems (Luszczynska et al., 2007). Support can relate to physical assistance, psychological, social, emotional or financial aid. It may involve some or all of these components. Support in the context of breast cancer has been well established as essential to positive health outcomes (Feigin et al., 2000; Manne et al., 2005).

A study by Inoue et al., (2003) investigated the relationship between breast cancer patients' coping responses and family functioning. Women with breast cancer and their spouses (n=46) completed The Family Assessment Device and Mental Adjustment to Cancer scales during the post-operative period. This cross sectional study attempted to ascertain if a relationship between coping styles and adjustment exists. The findings linked poorer family functioning with higher levels of helplessness/hopelessness. Those with poorer support demonstrated poorer adjustment to breast cancer. Women exhibited better coping strategies when they were involved in a supportive relationship. The type of coping strategies varied for the women with breast cancer and their spouses and those adopted by women also correlated with the quality of the relationship that existed with their spouses (Inoue et al., 2003). Study outcomes concluded that coping strategies and adjustment are both strongly linked to family functioning and support.

The possibility of the significant other overestimating the support needs of the woman with breast cancer can also occur. Sandgren et al., (2004) aimed to examine the quality of life of confidants and women with breast cancers. Women (n=112) and their identified significant other completed the Functional Adjustment to Cancer Scale (Cella et al., 1993). Findings illustrated that confidants of women with breast cancer can often overestimate the level of emotional support that women need. Confidants ranked the needs of the woman as greater than what was expressed by the women themselves.

Women with breast cancer seek support from a variety of sources for numerous reasons, throughout their illness (Forrest et al., 2006; Arora et al., 2007; Sawin, 2010). Mayer and Grober (2006) in their publication “Silent Voices”, estimate that more than half of women access some form of support. The data obtained from the online sample of women (n=618) with advanced breast cancer were analysed with SPSS, using descriptive statistics, Chi-square tests and ANOVA. Women identified seeking support for the following reasons: making a decision about or starting a new treatment (62%); having problems with treatment side effects (60%); experiencing a recurrence or a progression of their disease (59%); feeling worried or sad (58%). Half of these women wanted help with coping when they felt alone with their cancer (50%). Fewer women with cancer sought emotional support, practical support and coping tips when they're not well enough to do the things they find meaningful (38%); and less commonly when they're having problems with families, partners, and/or friends (26%) (Mayer and Grober, 2006).

Studies on women with breast cancer identified the need for information digression and communication regarding psychosocial care and support (Sawin, 2010; Belcher et al., 2011; Chou et al., 2012). Among those women that availed of support, siblings (85%, n=525) and spouses/partners (82%, n=507) were seen as the most frequently accessed for support (Mayer and Grober, 2006 p27). Children (75%, n=463) and friends (74%, n=457) were also identified as sources of support depending on the age category of the woman with breast cancer. Other relatives (69%, n=426) and parents (67%, n=414) provided support for more than two-thirds of women. Support group members (65%, n=402), and other women with breast cancer (62%, n=383) were also accessed for support. Of the women surveyed 64%, (n=395) considered co-workers as a potential source of support. Women with advanced cancer were most satisfied with the support they received from their spouses/partners (76%, n=467), "buddies" from breast cancer organizations (71%, n=439), and from siblings, friends, and support group members (71%, each for these last three categories), rating the support they provided as "excellent/very good" (Mayer and Grober, 2006 p27).

Another study by Hinnen et al., (2007) using a longitudinal design investigated distress, neuroticism and time since diagnosis, as determinants of spousal support behaviour (i.e. "protective buffering" and active engagement). Partners (n=92) of women with breast cancer completed a questionnaire to assess support behaviour. Results indicated small but significant decreases in "protective buffering" and "active engagement" over time. The distress and neuroticism experienced initially by spouses were found to be strongly and positively related to protective buffering. A correlation between spousal distress and their wives' condition was also prevalent. Spouses indicated higher levels of distress as a result of taking on the concerns of their loved one. They tried to protect the woman by taking on the stress. Over time levels of distress reduced, therefore time since diagnosis is considered to be a contributing factor to levels of support (Hinnen et al., 2007), both in the context of support needs and support provision. As time moves on the support needs of the woman and her significant other may alter, resulting in greater adaption and adjustment to breast cancer (Hinnen et al., 2007).

The idea that family members can overestimate the needs of women with breast cancer is balanced by the effect family support has on outcomes for women with breast cancer. Women with breast cancer have identified the important role that family support plays in their care (Beaver et al., 2016). An improved quality of life and increase in physical activity for the woman with breast cancer can be linked to greater family support (Northouse et al., 2010; Cheng et al., 2012).

Support and relationships appear to be strongly linked to quality of life. The support received and the quality of the relationship have been identified as influencing the QOL of women with breast cancer and their significant other (Bergelt et al., 2008; Gelliatry et al., 2010). As well as impacting on physical health and health related quality of life (HRQL), support has also been linked with emotional wellbeing. Luszczynska et al., (2007) in a quantitative study examined emotional support provided by intimate partners to men and women with cancer (various types) over a period of six months. One hundred and seventy three couples and 224 significant others, (173 were intimate partners i.e. spouses or equivalent opposite-sex couples, the remaining 51 were children, grandchildren, siblings, parents, or friends) participated. The Berlin Social Support Scale

(BSSS) (Schulz and Schwarzer, 2003b) was used to assess support. The study highlighted the need for alternative sources of support to be identified, in particular for women, such as their network of family, friends or professional help. These other sources of support can also act as support structures for the significant other of the woman (Luszczynska et al., 2007).

In addition to this, Emery et al., (2009) in their study which sought to assess the determinants of physical activity among women with breast cancer identified support as a key issue. This 5 year longitudinal study conducted follow-up evaluations on women with breast cancer (n=227) at stages II and III. Evaluations were conducted every 4 months during the first year and every 6 months during the subsequent 4 years (12 assessments in total during the 5-year study). Following measurements of levels of physical health status, health related quality of life (HRQL), depressive symptoms, and social support, findings indicated that women with greater social support showed slower declines in physical activity. The HRQL of women with greater support was also higher.

The provision of support within the context of breast cancer is seen as one of the most significant contributing factors for positive outcomes (Emery et al., 2009). This was also evident for significant others (Lethborg et al., 2003). Support is important as women with breast cancer are often dealing with a lot in their lives including working, parenting in addition to undergoing treatments (Beaver et al., 2016) and/or surgery which can all add to the woman’s burden. Support behaviours can relate to support seeking behaviours and support receipt behaviours (Pietromonaco et al., 2013). Either person in the relationship may exhibit these behaviours at differing times for different reasons. Support seeking is the term used to refer to the behaviour of requesting, asking or needing of support (Belcher et al., 2011). Support seeking behaviours are aimed at attempting to promote the other person in the relationship to provide support and comfort. Support receipt is the acceptance of the support. This refers to the ability of one person in the relationship to receive support to another (Pietromonaco et al., 2013).

The importance of support in relationships can be seen in Belcher et al.'s, (2011) study. The sample of women (n=45) and their spouses completed electronic diaries, for seven consecutive nights, in an attempt to measure support sought and received by women with breast cancer. The study examined the links between women's report of receiving support from spouse and their spouses' reports of providing support. Following analysis of the diary entries numerous factors were evident. Apart from the need for women with breast cancer to be supported, their spouses also identified a need for support (Belcher et al., 2011). This concept of support being a two-way process where both people in the dyad must feel supported is strengthened by the depiction of the two-way arrows in the attachment diagram (Figure 2.1 path e).

The issue of receipt of adequate support is also prevalent. Belcher et al's., (2011) study illustrated the complexity of support seeking/receipt behaviours. Women with breast cancer (n=45) stated that "they would seek support from their partners but were not always confidant or reassured with the support they received". There were also discrepancies between what the partners felt was provided and what the women felt was received (Belcher et al., 2011). The authors highlight that it is necessary to ensure what is being requested is provided and received. The seeking and receipt of support also appears over simplified as many women and their significant other referred to support as being "more than seeking/receipt behaviour", support is considered as a broad term comprising of many elements (Belcher et al., 2011).

Adequate support was seen as impacting on the woman's adjustment, coping and functioning following a breast cancer diagnosis (Budin et al., 2008). Greater levels of support have been found to be associated with greater levels of adjustment to breast cancer, while also reducing psychological and emotional stress (Manne et al., 2009; Northouse et al., 2005). This supports the view of Pietromonaco et al., (2013) which proposes an association between "relationship behaviours" and the quality of the relationship (Figure 2.1 path c and d). These findings are also supported by Levy's (2011) study which aimed to determine the effect of support group sessions on the spouses of women with breast cancer (n=7: 5 married, 2 unmarried, but in long term relationship). Findings indicated that spouses perceived their role in the relationship as a need to be strong throughout the illness. They noted a need to support the woman through the cancer trajectory. The identified themes were: protector-ship, need for the partner to be strong as opposed to weak and providing their female partners with support. Often partners of women found it difficult to balance the act of being there whilst allowing the woman to make her own decisions.

Leading on from issues arising between partners finding it difficult to allow the woman with breast cancer to be independent whilst still being there, a study identified the conflict that partners experienced in attempting to give support without being overly protective (Pauwels et al., 2012). Partners of women following breast cancer treatment (n=84) who were involved in an intimate relationship were surveyed regarding their psychosocial characteristics associated with breast cancer. Partners felt a greater need to promote the woman's choice and act as a supportive foundation, however the need to consider the partners emotional, informational and physical needs were also expressed (Pauwels et al., 2012).

The importance of both the women with breast cancer and her significant other of feeling supported, whether within the dyad itself or from other sources is evident. As evident in the above studies, the relationship of the person who provides the support has a significant impact on how that support is received by the woman with breast cancer i.e. whether spouse, parent, friend etc. The need for women with breast cancer to support their significant other is also identified in the literature.

Various types of support were evident in the literature: psychological (Feigin et al., 2000; Luszczynska et al., 2007), emotional (Arora et al., 2007), financial (Sjovall et al., 2009; Preau et al., 2011), physical (Fletcher et al., 2010), informational (Nikoletti et al., 2003) and social (Gelliatry et al., 2010). The type of support required and the stage of breast cancer were seen as influencing the support provision. Levy (2011) concluded through group sessions that male spouses found difficulty in dealing with the emotional aspects of breast cancer. Male partners stated that they found providing emotional support as the most challenging item. The male partners felt awkward when their wives addressed their emotions and were unsure of how to deal with them. Literature highlights the complex nature of support. Support involves a two way process where the balance between support seeking and receipt for each individual has to be maintained. Women stated family support was the most important source of support, protecting from psychological distress, while for their male partners, support from friends was deemed most important (Beaver et al., 2009; Levy, 2011). Providing comfort was seen as difficult, whereas physical tasks were seen as more easily facilitated (Levy, 2011). This is concerning as women with breast cancer identified the need for adequate support specifically emotional and psychological throughout the cancer trajectory.

This section has demonstrated that support is seen as the most significant contributing factor for depicting health outcomes for women with breast cancer. Women with breast cancer seek support for a variety of reasons including physical, psychological, emotional and financial (Mayer and Grober, 2006), however, it was highlighted that significant others often overestimate the support needs of women with breast cancer (Sandgren et al., 2004). In terms of support it is also necessary to note that both the woman and her significant other may require support when dealing with a breast cancer diagnosis. Improvements in quality of life can be associated with greater levels of support (Emery et al., 2009). The next section discusses caregiving behaviours and how these are influential to the woman and her significant other.

Caregiving

Supportive behaviour is strongly linked with caregiving. Caregivers provide invaluable emotional, psychological and social support to the individuals in their care that they assist. Caregiving encompasses several aspects from providing assistance with activities of daily living, to acting as a support structure and confidant (Coristine et al., 2003). Caregivers have been identified as an at risk group in terms of health. Health ailments have been found to be significantly higher in caregivers than those individuals not involved in the act of caregiving (Pietromonaco et al., 2013). While caregiver burden is well researched, less research has been conducted that explores caregiving behaviours. The way a caregiver acts towards the woman with breast cancer can impact on health outcomes and disease adjustment. The caregiving behaviours pertinent to women with breast cancer and their significant other will now be discussed.

In terms of caregiving both positive and negative behaviours such as ignoring, non-listening and/or threatening exist. The way a caregiver views their act of caring, whether caregivers perceive their current relationships as rewarding, predicts caregiver emotional wellbeing and the risk of developing potentially harmful behaviours. Differences between spousal caregivers (SCGs) and non-spousal caregivers (NSCGs) in relation to dealing with the act of caregiving have been highlighted. Coristine et al., (2003) assessed spousal caregivers (SCGs) and non-spousal caregivers (NSCGs) i.e. close friends or relatives of women with advanced breast cancer (n=18). SCGs and the women worked cooperatively and shared the decision making process. SCGs identified the need to manage multiple roles but confirmed that employers' support and allowances of absenteeism were essential to caring for their wives. NSCGs were identified as having the most life roles/tasks to manage. The caregiving role was seen as increasing in the terminal phase as the woman's needs increased. Negotiating the care process was also easier for SCGs than NSCGs. Overall, caregiving was seen as easier for SCGs than NSCGs. The study highlighted the great responsibility of providing care, the complexity of additional life roles that the carer has to maintain, the benefits of living with the woman and the involvement of caregivers in the decision making process.

Viewing of the caregiving role as a positive entity may also mediate the relationship and affect its outcomes. Kim et al., (2007) surveyed spouses and offspring of women with breast cancer (n=448) in relation to how they appraised the caregiving experience. Adult daughters appraised the experience as stressful (negative), and sons appraised the experience as the least stressful. The findings suggest that caregivers of people with cancer may benefit from viewing their involvement in cancer care as meaningful and as a personal growth experience. The need to aid carers in seeking support to minimize the caregiving stress was also suggested. It appears that the quality of life of the patient and carer are strongly linked with both being interdependent on each other. Kim et al., (2007) associated the caring process with an appraisal system with male caregivers more likely to appraise the caregiving experience as boosting their self-esteem (positive) than female caregivers. More importantly, caregivers' esteem and caregiving stress were strong predictors of the caregivers' quality of life.

The tasks involved in caring for their loved one with breast cancer also impact on other aspects of the significant others' life. This was depicted by Bradley and Dahman (2013) in an attempt to explore the effect of a cancer diagnosis on male spouses of women with breast cancer. Employment data on 373 married, insured, and employed men from 2007 to 2011 was collected. These were compared to a control group ($n = 451$ for the 2-month survey and $n = 328$ for the 9-month survey) from the Current Population Survey. Spouses of women who were newly diagnosed with cancer were more likely to decrease weekly hours worked ($p < 0.05$), 2 months following treatment than spouses in the control group (non-cancer). Breast cancer treatment had a small, negative effect on work outcomes in employed spouses of affected women. The male spouses of the women diagnosed with breast cancer were found to have to prioritise the needs of their wife and other family members, with several stating the need for a reduction in working hours, which is indicative of this. Treatment type and duration may also be considered to be influencing factors. As treatment regimens progress and become routine, the care recipient and caregiver appear to adapt. In conjunction with this, as time moves on the degree of adjustment becomes greater and so the impact of external stimuli such as work, household duties etc. become less imposing (Bradley and Dahman, 2013).

Probst et al., (2012) supports Bradley and Dahman (2013) in depicting the profound impact caring for the woman with breast cancer with a fungating wound has on the caregiver. Through conducting interviews with carers of women (n=7: partners=5, mother=1 and daughter=1) authors noted that the physical act of caring had a significant toll on the life of the caregiver. Themes identified included: burden of care, affect to daily life, increase in workload, stress and holistic approach to care. This is demonstrative of the affect that the breast cancer diagnosis has not solely on the woman but also her caregiver. Similarly, Bailey et al., (2010) examined the relationship between the extent of caregiving responsibilities and depressed mood over time (at 6-month and 1-year follow-up) and whether having caregiving responsibilities were differentially associated with depressed mood in early-stage breast cancer. The researchers noted that women (n=1,096: 549 patients (with breast cancer after treatment) and 547 controls (women following a benign mammogram) with multiple caregiving roles were more likely to be depressed. Pinkert et al., (2013) support the impact of breast cancer on caregivers and relatives of women with breast cancer and the need for integration of these significant individuals into the care process.

In summarising the caregiving behaviours several areas were highlighted in the review. Caregiving can be divided into spousal and non-spousal. The complexity involved in caring for the woman with breast cancer is heightened by other confounding issues such as work, household duties, phase of disease and family life (Coristine et al., 2003). Thus, caregiver burden appears to be a prominent implication for caregivers in the breast cancer context. The ability of caregivers to cope with the physical side effects of the breast cancer treatments while maintaining intimacy is conducive to strengthening of the relationship (Kim et al., 2007). Findings suggest that viewing the caregiving role as meaningful has a significant effect on the relationship of the woman with breast cancer and her significant other. However, while caregiving was identified as a significant area in breast cancer, the review highlighted that caregiving is often not referred to by women with breast cancer and support is seen as being more applicable to the relationship with their significant other. Caregiving tends to be more suitable to relationships that involve the assistance with activities of daily living and/or disabilities. For this reason caregiving was not included as a key measurable variable in the study. Another dimension of relationship behaviour is social negativity. Studies around this theme will now be reviewed.

Social Negativity

Social negativity and support are considered to be inversely related. Social negativity is considered to be more prominent in familial relationships as oppose to non-familial ones and also tends to be in more abusive or violent relationships (Pietromonaco et al., 2013). Research has identified a correlational link between social interactions and health (Ganz et al., 2003). Research on social negativity is progressing however, little is still known regarding the deeper impacts of socially negative environments on social functioning (Ibarra-Rovillard and Kuiper, 2011). A more apt title for the linkage between the concepts of social negativity and social support is social functioning (Ibarra- Rovillard and Kuiper, 2011). The above study found that individuals indicating better social functioning as a result of less social negativity and higher levels of social support demonstrated better overall functioning (Ibarra-Rovillard and Kuiper, 2011). Examining social support is beyond the scope of this discussion so the focus of this section will remain with social negativity however, it is important to note that the both are intrinsically linked. Pietromonaco et al., (2013) states that "social negativity refers to the emotionally harmful or psychologically negative attitudes within social interactions" (Pietromonaco et al., 2013 p 502).

Negative social interactions and attitudes were found to influence women with breast cancer, as many of them expressed embarrassment or fear of being rejected by spouses (Wimberly et al., 2005). Conflict or abusive relationships are seen as detrimental to the woman's health (Sawin, 2010). Furthermore confrontation can be overwhelming to the woman and increase physiological responses such as stress and anxiety (Bergelt et al., 2008, Fletcher et al., 2010). Social negativity can lead to depression, lower adjustment levels and higher psychological ailments (Levy, 2011). The important role of social relations was evident in the literature review. Women with negative social groups had poorer health outcomes overall (Belcher et al., 2011; Pinkert et al., 2013).

Sawin (2010) within an American context explored the experiences of older women (n=9) living in rural areas, diagnosed with breast cancer while in a non-supportive, and sometimes abusive, intimate relationship. The participants completed the “Women's Experience with Battering (WEB) Scale”. Women identified driving, gossip, rural location and social support as therapeutic. Women were assessed to see if those involved in socially negative circumstances (abusive/dismissive relationships) demonstrated more health problems including depression and anxiety. Women with less supportive partners demonstrated greater problem areas with higher incidences of stress, problems with travel, financial worries and relational hardships. Women identified their social network as a means of support. Talking about the cancer and having someone to listen was highlighted as positively influencing the women’s adjustment to breast cancer. Women identified a negative relationship or social network as having a negative impact on them and as a result demonstrated poorer outcomes with higher incidences of psychological and emotional stress.

Levy et al., (2011) identified similar results in partners of women with breast cancer (n=7). The study found spouse perception of the illness as “the need for the man to be strong versus weak”, however spouses indicated an inability to cope with emotional and social aspects of the cancer. Zahlis and Lewis (2010) identifies further issues that spouses (n=48) may feel when dealing with a breast cancer diagnosis. These centred on feelings of the cancer changing them as a couple as well as trying to make things work.

Thus, social negativity: (I) is considered to be extensively linked with support within the literature, (II) impacts on the perceived and received support from significant other (III) can result in higher levels of psychological ailments (Levy, 2011) and (IV) can present challenges to the relationship. Socially negative relationships where violence or abuse exist are detrimental to women's wellbeing. However, psychologically or emotionally neglectful relationships can also impact severely on women with breast cancer (Bertera, 2005). The term social negativity appears to be more associated with intimate relationships that are violent or abusive. For the purpose of this study social negativity was not measured as it focuses more on negative intimate partner relationships.

In summary, of the three relationship behaviours presented in Pietromonaco et al's., (2013) framework, in the review of the literature the most prominent relationship behaviour was support seeking/support receipt. Women with breast cancer and their significant other identified the importance of ensuring that within the relationship what is requested is received. Furthermore, caregiving and support are often synonymous, as caregivers of women with breast cancer can provide many forms of support at varying times throughout the disease process. Support can be linked with social negativity and lower levels of support are indicative of greater socially negative attitudes. In addition, relationship mediators and outcomes can also influence the health status of the women and their significant other. Literature relating to these concepts will now be discussed.

3.5.2 Relationship Mediators & Outcomes

The presence of factors that mediate the relationship was also highlighted in the literature. Relationships require certain elements to be in existence in order for these to function satisfactorily. These mediators can include responsiveness of one partner to the needs of the other, satisfaction with the relationship, and commitment to each other (Pietromonaco et al., 2013). The literature pertinent to these issues will now be discussed in detail.

Responsiveness

Responsiveness in terms of communicating considers how one partner responds via verbal and non-verbal means to another (Pietromonaco et al., 2013). Responsiveness is also associated with a sense of valuation, supportiveness and caring (Hagerty-Lingler et al., 2008). These terms are synonymous with a majority of relationship qualities. Responsiveness is important for the woman to feel that her needs are heard and met (Pietromonaco et al., 2013). Research on the responsiveness of women with breast cancer to their significant other was found to be limited. However, it can be assumed that negative effects occur when the woman is unresponsive to her significant other. When considering responsiveness it is important to also be mindful of unresponsiveness. Where one partner is unresponsive to their significant other the implications can range from anxiety, low mood, depression, low self-esteem and an inability to cope (Pietromonaco et al., 2013). These side effects can result in physical manifestations of illness including weight loss, lack of sleep and poor quality of life overall (Hagerty-Lingler et al., 2008).

Responsiveness in this context relates to partner responsiveness. Partner responsiveness is the way one partner in the relationships responds to the needs of the other (Pietromonaco et al., 2013). A breast cancer diagnosis is an attack on the woman’s identity and can include a post-surgery wound, a scar, loss of hair or other side effects. The way a woman’s significant other responds to her needs, care and self-image can dramatically affect her recovery (Belcher et al., 2011). All these elements can cause stresses to the relationship. Whether the relationship dyad that exists involves a patient-partner situation or has the family participants involved, there is an alteration to the relationship following a breast cancer diagnosis (Feldman and Broussard, 2005). As a result the roles played by the individuals in the relationship need to adapt to accommodate the new challenges that accompany a breast cancer diagnosis.

Furthermore, Wimberly et al., (2005) used two studies to examine women with breast cancers perception of their partners' reactions to their diagnosis and treatment, depicted in three aspects of the woman’s wellbeing i.e. psychosexual adjustment, emotional distress, and marital satisfaction. Study 1, a cross-sectional study of woman (n=170) found that partner initiation of sex, frequency of sex, a positive first sexual experience after treatment, and especially perception of the partner's emotional involvement in the relationship, were identified as key influencing factors for health outcomes. Study 2, a longitudinal survey with a sample of women (n=170) who were followed up with consecutively, confirmed many of these findings in prospective tests across 1 year of recovery after surgery. Responsiveness can make women with breast cancer and their significant other feel comfortable, valued, appreciated and understood.

Later Zahlis and Lewis (2010) examined the experiences of spouses of newly diagnosed women with breast cancer. The sample of spouses (n=48) participated in open ended interviews of 20-45 minute duration. The spouses stated that “the cancer changed them as a couple”. Most spouses identified the need to take care of the “us”. Spouses expressed feelings of “being nailed by the cancer”. The task of making things work while struggling with the breast cancer regime was also evident. This study supports the necessary partnership involved in informal caregiving for women with breast cancer. Spouses also stated a “need to respond and change to accommodate the breast cancer diagnosis”. The spouses identified the essential need to take care of each other. Women confirmed that the level of partner responsiveness including how well they reacted to their physical appearance post-surgery, side effects and treatments were important to their overall self-image and as a result affected their adjustment (Zahlis and Lewis, 2010).

Similar findings were seen in Mazzotti et al.(2012) study which used face to face interviews with women with breast cancer (n=8) to ascertain women's experiences of dealing with breast cancer. While the women expressed several elements that caused them concern, the maintenance of their relationships with loved ones was paramount. The woman's struggle to maintain family normality while dealing with the cancer was highlighted as one of the main challenges they faced.

Women with breast cancer require partner involvement in their care, although it is important that this involvement is positive as negative partner responses have been seen to impact greatly on outcomes. The response of the partner to dealing with treatment, daily life and physical alterations in appearance can affect how the woman responds to breast cancer (Wimberly et al., 2005). Individuals respond differently to a breast cancer diagnosis. This makes responsiveness a centrally individualistic concept. A common component identified in the literature was the woman's need to see her partner respond positively toward her (Zahlis and Lewis, 2010). For women, chemotherapy, presence of physical symptoms and intimacy were strongly linked to strengthening in the couple's relationship (Zahlis and Lewis, 2010). In the context of breast cancer, other studies have shown relationships between factors such as concerns about appearance (scars, prostheses and hair loss), chemotherapy side effects and the psychological adjustment to the illness (Wimberly et al., 2005). In addition, the importance of the partner coping with the woman's adjustment to cancer and the challenges they may face were also apparent (Zahlis and Lewis, 2010).

In summary, communication and intimacy are both strongly correlated positively with responsiveness. Partner responsiveness can impact on the woman with breast cancer and her outcomes (Wimberly et al., 2005). The way the significant other of the woman with breast cancer responds to treatment, body image and the woman’s needs, affects how the woman adjusts (Feldman and Broussard, 2005). While women with breast cancer and their significant other identify the need to adapt to changes as a result of a breast cancer diagnosis, the level of partner involvement, maintenance of closeness and appropriate responsiveness influenced the level of adjustment, marital satisfaction and ability to cope. Responsiveness appears more influential when associated with intimate relationships and in terms of non-intimate relationships may be more challenging to identify. Self-disclosure and intimacy in close relationships enhance partner responsiveness (Laurenceau et al., 1998). A concept that is linked with partner responsiveness is relationship satisfaction. This will now be discussed in the context of women with breast cancer and their significant other.

Satisfaction

While several types of satisfaction exist including marital, partner, relationship etc, it is relationship satisfaction that is addressed in this section. Relationship Satisfaction is concerned with how happy or content the individuals in the relationship are with their current relationship (Belcher et al., 2011). Satisfaction with the relationship is important as those who are content with their relationship will strive to maintain it and nurture it (Pietromonaco et al., 2013). Relationships where one or both parties are non-satisfied or their needs are not being met will result in conflict and overall have poor outcomes. A degree of happiness is required in order for relationships to function, otherwise individuals struggle to see the necessity in the relationship (Pietromonaco et al., 2013). This is specifically true for patients with breast cancer. As a new challenge is introduced to a relationship the level of satisfaction may change. With breast cancer the added stress, burden and life alteration that accompanies the diagnosis can cause lower levels of satisfaction to occur in the relationship (Pietromonaco et al., 2013). This notion of satisfaction is important for any relationship whether work, social or leisure but is highly evident in close relationships, such as women with breast cancer and their significant other (Pietromonaco et al., 2013).

Women stated that relationship satisfaction was another contributing factor to their overall wellbeing (Wimberly et al., 2005). This paper cites two studies that examined women's perceptions of their partners' reactions to their diagnosis and treatment. The influence of partner perceptions were viewed in relation to three aspects of the women's wellbeing: psychosexual adjustment, emotional distress, and marital satisfaction. Study one consisted of women in a partnered relationship (n = 170) who were taken from a larger sample. The study measured psychological adjustment and distress. Analyses revealed that the woman's perception of having a positively involved partner related positively to her own wellbeing. Women's wellbeing was strongly related to the positive emotional involvement of their partners. Similarly, perceived sexual interest from her partner, sexual frequency, and positive perceptions of the first sexual interaction post-surgery all related to the woman's wellbeing and satisfaction with the relationship. It was found that a partner's adverse reaction to the scar predicted less marital satisfaction and poorer adjustment levels, overall.

The second study (a longitudinal design), confirmed many of these findings across a one year post-surgery period (Wimberly et al., 2005). A sample of women with breast cancer (n=49) was followed for one year, starting at the time of the diagnosis and surgery. The researchers conducted interviews at an initial phase, and pre-surgery. Partner involvement was seen as relating to the outcomes for women. Partner initiation of sex predicted greater marital satisfaction; partner adverse reaction to the scar predicted less marital satisfaction. This pattern suggests that the women's impressions of their partners' emotional involvement following breast surgery, impacted on their adjustment in sexual, marital, and emotional areas over the year (Wimberly et al., 2005). However, being the person most intimately involved in the woman’s illness and treatment has been found to present a significant challenge due to fear of the cancer and the burden of demands being placed on their lives (Wimberly et al., 2005).

A similar study by Manne et al., (2007a) evaluated the role of cognitive and social processing in partners’ psychological adaptation to breast cancer. Partners of women diagnosed with early stage breast cancer were evaluated shortly after the women’s diagnosis (n=253), and again at nine months (n=167), and 18 months (n=149). The sample completed measures of emotional expression, emotional processing, acceptance and meaning-making. Lower satisfaction with partner support predicted greater levels of distress in women with breast cancer. Also lower levels of support were associated with lower satisfaction with relationship and higher levels of distress in the partners of women with breast cancer (Manne et al., 2007b).

Satisfaction with the relationship also has an effect on “protective buffering” and psychological distress. “Protective buffering” is defined as the concealment of worries and concerns, and conceding to a partners’ request in an attempt to avoid confrontation or friction (Manne, Norton, Ostroff, Winkel, Fox and Grana, 2009). Manne et al., (2009) surveyed women and their partners (n=235) using measures of protective buffering, psychological distress, and relationship satisfaction at 3 time points over an 18-month period after a breast cancer diagnosis. Protective buffering was indicative of more distress among women who rated their relationships as more satisfactory, whereas protective buffering did not predict distress among patients rating their relationships as less satisfactory. These findings illustrate conditions under which protective buffering may have detrimental effects i.e. anxiety, stress, uncertainty (Manne et al., 2009).

More recently Gelliatry et al., (2010) aimed to identify the influence of a qualitative expressive writing intervention on perceptions of emotional support in the relationship process of women with breast cancer. A sample (n=104 of which 93 were randomised) took part in an expressive writing intervention in the study. Expressive writing was associated with higher levels of satisfaction overall. Satisfaction with emotional support was negatively correlated with depression and anger and positively correlated with social and family wellbeing. There were no significant effects of the intervention on mood, QOL or healthcare utilisation.

These findings are supported by another more recent descriptive cross sectional study (Pinkert et al., 2013) using questionnaires. The authors surveyed the needs of the relatives of breast cancer patients and their current level of satisfaction, to ascertain which needs were perceived by nurses and relatives as important. A randomised sample of 242 relatives (65.5% spouses, 17.9% children, friends 4.3% other, either mother/father/sister/brother/in laws 10.3%) and 356 nurses also participated. The sample of relatives identified the request for the integration of the family in cancer care. Information and support needs were seen as important to relatives as well as the need to be viewed as an integral part of the process. The findings indicate that relatives need above all security and trust, partnership of care and emotional support. The nurses regarded the importance of most of the relatives' needs to be higher than the relatives themselves. Results demonstrate the need for collaboration in breast cancer care between the woman diagnosed with breast cancer, their loved ones and healthcare professionals. Among these findings, information digression, involvement in care and availability all influenced the level of satisfaction of the woman's spouses. This study concluded that while satisfaction with information, relationships and treatments are important factors for women with breast cancer they are equally important for their significant others.

In summary, there are several types of satisfaction i.e. relationship, partner, marital. In terms of relationship satisfaction several contributing factors exist. These include partner involvement and response, maintenance of intimacy, active engagement and "protective buffering" (Gelliatry et al., 2010, Pinkert et al., 2013). Satisfaction with relationships is important as those who are content in their relationship will strive to maintain it. Lower satisfaction with relationships has been linked to distress, anxiety, depression and poorer quality of life and wellbeing overall (Wimberly et al., 2005). Studies relating to commitment in the breast cancer context will now be discussed.

Commitment

Commitment is the level of investment one has in something (Pietromonaco et al., 2013). In the breast cancer context it relates to the level of commitment to the relationship (Pietromonaco et al., 2013). Commitment in terms of breast cancer appears to be synonymous with closeness and connectedness. Closeness is the maintenance of proximity to an element, which is also one of the principles set out in Bowlbys' (1969) Attachment Theory. As the terms commitment, closeness and connectedness are seen as synonymous in the relationship context, these will be discussed together. Where relationship commitment is high, levels of closeness and connectedness are also high (Hagerty-Lingler et al., 2008). Connectedness refers to a sense of feeling part of something. This is defined by Pietromonaco et al., (2013) as a feeling of being part of or belonging to the relationship.

Preau et al., (2011) used a cross sectional design in a qualitative study to determine characteristics of patients who reported a strengthening of their relationship 2 years after a cancer diagnosis. Within the sample of men and women (n= 3221) who had a variety of cancers and were still living with the same partner as at the time of their diagnosis, 32.8% of men and 41.5% of women declared their illness had brought them closer (Preau et al., 2011). Partners stated having a level of commitment and investment in the relationship. Themes such as couple coping and a need to be there were expressed by participants throughout the interviews (Preau et al., 2011). These findings underline the importance of providing adequate information and psychological support to couples facing a cancer diagnosis.

Previously, Fletcher et al., (2010), examined the concerns of spouses (n= 151) of women with non-metastatic breast cancer. Partners stated that their own functioning abilities and worries regarding their wife's wellbeing and response to treatment as well as couples' sexual activities were areas of concern. Partners’ commitment to be there for their wives was also highlighted, but also side effects, treatments and increase in responsibilities made this difficult. The need to maintain intimacy and closeness were challenged by the presence of breast cancer. The wellbeing of the family and children and the spouses' role in supporting their wives were all aspects for concern. These fears and worries expressed by spouses are demonstrative of the changes that occur in the relationship behaviour. It was highlighted that new challenges are introduced that must be addressed. These changes include stressors and problems that are often complicated and personal to the dyad, ultimately influencing the commitment within the relationship.

Probst et al., (2012) explored the experiences of carers of women with breast cancer (n=7) conducting semi structured interviews on carers’ experience of dealing with a fungating wound for women with breast care. Carers (n=5 partners, n=1 mother, n=1 daughter) were interviewed for between 55-95 minutes. Carers identified the burden of care, its effect on daily life, increase in workload and psychological stress as problem areas. Many spouses stated a want to “be there for her” throughout the cancer. The psychological and physical burden of caring for a fungating wound was highlighted as stressful and impacting significantly on the relationship. The amount of time that carers needed to spend dressing the wound allowed little time for couple interaction. Carers identified the emotional issues of rage, frustration, anger, denial, and sense of loss and fear. Many carers emphasised the monotonous act of doing the dressing 2-3 times a day due to a large degree of exudate. Carers also attempted to reassure their loved one but found the on-going daily task of dealing with the wound to be exhausting. These elements are supported by Alexander and Wilz (2010) and Levy (2011) who identified that the nature of caregiving is often considered an emotional process that can leave the caregiver feeling burnt out.

Closeness

An early study by Manne et al., (2004) in the U.S used observational methodology to examine the association between couple communication, psychological distress and relationship satisfaction among couples (n=148) facing breast cancer. The couples were videotaped while discussing a pre-selected cancer topic, followed by a discussion of a mutually agreed relationship problem. Findings highlighted the role of partners as being positive. Less hostile responses were found in women with positive partners (social positivity). Positivity was also associated with higher levels of adaption to breast cancer in women. Women exhibited signs of distress when their partner attempted to resolve the problems. Less distress levels were associated with humorous responses. Partners who were engaging and communicated with their partners closely and openly were associated with women with less psychological, emotional and mental health problems. These findings are indicative of the relationship dynamics that can occur where the women is diagnosed with breast cancer.

Connectedness

Similarly, “social connectedness” acts as informal information and a decision support network (Carlsson et al., 2005). It provides the interaction which is innately required by human beings. Carlsson et al., (2005) also highlight the important function the supportive relationship can play in breast cancer. Their qualitative study of women (n=8) in Sweden with breast cancer, who were linked to women survivors of breast cancer (contact person) identified the following themes: (I) shared experiences give new perspectives on having cancer, (II) feelings of isolation are a part of the identity of the illness and (III) relations with others enable self-help. The relationship with the women survivors is sensitive to timing, correct information and understanding. While participants expressed the positive effect of the link survivor person, the necessary time and organisation that it took to arrange the meetings was seen as a negative factor. Nonetheless, women found that having connectedness to another person who had been through similar experiences, was helpful and cathartic (Carlsson et al., 2005).

Summary

Commitment has been identified as playing a pivotal role in relationships and how relationships function. Commitment to a partner when coping with a breast cancer diagnosis can be inherently linked to a strengthening of the relationship (Preau et al., 2011). Commitment, closeness and connectedness are terms often grouped together in an attempt to understand relationships. Where commitment levels are high, closeness and connectedness levels also tend to be high (Hagerty-Lingler et al., 2008). Commitment in the breast cancer context has been shown to act as a support network (Carlsson et al., 2005), provide emotional aid and assists in adjustment to a breast cancer diagnosis

(Manne et al., 2004). Commitment can increase couple functioning as well aid in dealing with the new challenges that a breast cancer diagnosis brings (Fletcher et al., 2010).

In summarising the relationship mediators and outcomes, a few points are worthy to note. Firstly, while partner responsiveness is a key relationship mediator affecting health outcomes for women with breast cancer the review however, identified it as being predominantly associated with intimate relationships (Feldman and Broussard, 2005). In addition, relationship outcomes such as satisfaction and relationship mediators such as commitment can influence outcomes. While several types of satisfaction exist (Belcher et al., 2011) relationship satisfaction was highlighted as the most prominent one associated within the breast cancer context. Commitment which is intrinsically linked with closeness and connectedness was also identified as being important in relationships in coping with a breast cancer diagnosis, however this appears to be more applicable to intimate relationships.

It is apparent that the dyadic process can have an effect on the relationship mediators and outcomes, however these mediators and outcomes can also affect the dyadic process (Pietromonaco et al., 2013) (Figure 2.1) (paths f, g). Additionally, the effects of these mediators and outcomes influence health processes (Pietromonaco et al., 2013 Figure 2.1) such health processes include physiological responses, affective states, health behaviours as well as health and disease outcomes. Studies on physiological responses pertaining to women with breast cancer and their significant other will now be discussed.

3.6 Health Processes

3.6.1 Physiological Responses

Physiological responses is a term used to describe how one reacts to a stimulus and incorporates the idea that each person within the relationship can influence and is influenced by the relationship (Pietromonaco, 2013) (Figure 2.1 and Appendix 12 Paths f/g). A physiological response is the presentation of certain manifestations as a result of a stimulus (Kassam and Mendes, 2013). It can be shaking, sweating, increases in heart rate, low mood, crying, stress etc. The way we respond physiologically is considered to be linked with our emotions. Thus, health behaviour is used to describe acts or beliefs about health that the individuals in the relationship demonstrate i.e. women with breast cancer may be healthier because they run regularly, but may run regularly due to their partners' interest in running. In an attempt to maintain the dyadic relationship parameters, the woman continues relational activities, with the direct result of improved health practices and hence improved health. The attachment theory also includes examples of pathways through which each partner can influence the other (Paths e, h, I, j) (Figure 2.1). The main physiological response to breast cancer presented in the literature is stress. Relevant studies will now be reviewed.

Stress

Stress is an ever expanding area within the current healthcare system due to the significant implications it can have on health. Stress has been linked to psychological, physical and emotional wellbeing. Stress is termed as a psychological response to a threat or a stimulus (Seyle, 1936) but can have notable physiological results. Seyle (1936) was the first to transfer the concept of stress from engineering terms to a symptom resulting from certain phenomena. Seyle (1936) concluded that stress response is non-specific. Therefore, many conditions can put strain on humans and result in health implications. However, Seyle only investigated physical stressors and their impacts. Nowadays, stress is seen as encompassing psychological stressors also. This has led several scientists such as John Mason (1968) to measure internal regulatory responses such as hormone levels in people exposed to stressful situations. Mason (1968) and his team measured levels of hormones and psychological characteristics that were released during stressful situations e.g.

cortisol levels in saliva and epinephrine/norepinephrine levels. Many studies use measurements of hormones to ascertain if stress is present (Lazarus and Folkman, 1984). These hormones give rise to the fight or flight response mechanism which in turn causes increases in heart rate and blood pressure alterations.

Mason determined that certain parameters needed to be present for a human to experience stress. Firstly, the situation must be novel, have a degree of unpredictability and finally the person must have a feeling that they have no control over the situation or its outcomes (Mason, 1968). Leading on from Seyle and Mason there exists predominantly two ways of measuring stress i.e. by using psychological questionnaires and physiological responses. Psychological questionnaires measure concepts. These concepts can be language, cognition, personality and emotions. Other concepts outside of these may also exist. Psychologists developed questionnaires that cover a wide range of psychological symptoms.

Lazarus and Folkman (1984) describe stress as an imbalance occurring between the demands and resources of an organism. This definition is perhaps the most suitable to women with breast cancer and their significant other. Their transactional model (Lazarus and Folkman, 1984) states that stress is only a stressor when perceived as a negative imposition. Given the impact that stress can have on health, quality of life and psychological adjustment, it is a prevalent point for consideration in the healthcare sciences. Lazarus and Folkman (1984) describe stress and coping with it as being an active practice that involves the presentation of new and challenging stressors.

Stress is one of the most common physiological responses that women with breast cancer experience. This is related to the number of treatments, attendance at clinics, and fear of the unknown as well as the level of uncertainty incurred by a cancer diagnosis that women endure (Sawin, 2010). As well as stress being evident for the woman with breast cancer according to Kim et al., (2007) the experience can also be stressful for their significant other. The study sample (n=448) was a mix of spouses and children. In their study, caregiver's gender and relationship type to the care-recipient, caregiving appraisal, and quality of life were measured. Analyses revealed that male caregivers were more likely to appraise the caregiving experience as boosting their self-esteem (positive) than female caregivers, whereas adult daughters appraised the experience as stressful (negative), and sons appraised the experience as the least stressful. Higher levels of stress were found among female carers. Kim et al., (2007) associated higher levels of stress in males as opposed to females. The findings suggest that caregivers of those with cancer may benefit from programmes designed to assist them in viewing their involvement in cancer care as meaningful and as a personal growth experience, as well as helping them to seek support to minimize their caregiving stress.

Later, Forrest et al., (2006), explored the influence of a breast cancer diagnosis on women (n=37) and their children (n=31) in terms of the effect of the physical alteration of the woman with breast cancer. Interviewing women and children (6-18 years), findings concluded that children found the physical effects of their mothers' condition particularly stressful. This was specifically true in post-operative cases where a scar, hair loss or a wound was present.

Sawin (2010) aimed to describe the experiences of women (n=9) with breast cancer living in rural areas. The Women's Experience with Battering Scale (WEB) indicated that women experienced increases in their stress levels when they were involved in abusive or hostile relationships. Those women who indicated being in abusive relationships, also associated attending appointments, visiting friends and treatments as stressful as they found their partners were not willing to be involved in the process. They also experienced emotional issues such as low self-esteem and self-worth and a sense of loss if no other sources of support were available.

Similarly, Zahlis and Lewis, (2010) indicated the effect that a cancer diagnosis can have on spouses (n=48) in their study examining the experiences of women with breast cancer and their spousal partners. Spouses of women with breast cancer were found to exhibit physical ailments including fatigue, headaches, and loss of weight, loss of appetite, low mood, depression and nausea. These may be seen to be as a result of taking on the stresses and increasing the workload in order to compensate for the cancer diagnosis (Zahlis and Lewis, 2010). It also may be as a result of spouses often having to take on more housekeeping duties and may be required to be more active in the child rearing aspects of life as highlighted by Levy (2011). Therefore, the health of the caregiver can also be affected by the diagnosis of breast cancer. Although scarce, studies involving both (patient and carer) illustrated that symptoms experienced by spouse/carer mirrored those experienced by the women with breast cancer.

In summary, stress resulting from a breast cancer diagnosis can have significant implications on health outcomes. Research has demonstrated that going through a breast cancer diagnosis can be a stressful experience (Kim et al., 2007). The woman and her significant other can both experience stress for several reasons. Risk factors for stress need to be reduced to ensure negative outcomes for women with breast cancer and their families are minimised. Stress is considered to be strongly associated with affective states specifically both anxiety and depression. The concept of affective states will be discussed in the next section.

3.6.2 Affective States

In the context of affective states, anxiety and depressive symptoms are the main variables highlighted in the literature. Affective states are the mental moods of individuals (Pietromonaco et al., 2013). These can be related to the inner emotions or mental states that an individual has. These will now be discussed within the context of women with breast cancer and their significant other.

Anxiety and Depressive Symptoms

Affective states such as anxiety and depressive symptoms are significantly prevalent in the breast cancer context. Anxiety can be defined as feelings of restlessness, unease, being overwhelmed and usually can present in physical manifestations such as sweating, increase heart rate, nausea etc. (Burgess et al., 2005). Almost half of women are affected by anxiety in some form, at some stage throughout their disease trajectory (Burgess et al., 2005). Women's anxiety can result from several factors such as, the diagnosis, family life, financial worries (Sjovall et al., 2009), support (Ganz et al., 2003) and treatments. Cheng et al., (2012) in a prospective longitudinal study used assessment of anxiety to predict changes in the quality of life of women (n=61) three months post diagnosis. The study also used The Functional Living Index – Cancer, The Symptom Distress Scale and The Self-Efficacy Scale. While fatigue, pain and physical appearance were associated with greatest changes in quality of life, anxiety was identified as also negatively impacting on the woman's quality of life following the diagnosis.

The risk of anxiety for women with breast cancer can present further barriers to adjustment and recovery. Vahdaninia et al., (2010) conducted a prospective follow up study examining anxiety and depression in women with breast cancer (n=316) using the Hospital Anxiety and Depression Scale (HADS). The study concluded that while levels of depression and anxiety decreased over time, indications of depression and anxiety were still evident at follow-up. Similarly, Bulotiene et al., (2008) also used the HADS scale on a sample of women with breast cancer (n=117) to determine a link between social factors and anxiety and depression. Employment and marital status were seen as key influencing factors when predicting depression and anxiety. Women who were employed had significantly lower levels of anxiety than those who were unemployed or retired (these scores remained unchanged). One week following surgery the mean depression scores for women who were married were lower than those who were single, divorced or widowed (*p*=0.005, *ES*=0.51). The likelihood of depression in widowed/divorced women was eightfold in comparison to married women.

Depression or prolonged feelings of melancholy, low mood, sadness, hopelessness/helplessness and poor self-worth can produce a variety of severe symptoms. A co-morbidity that affects between 15% and 25% of cancer sufferers, depression is not gender specific and often affects the families of the individuals diagnosed also (National Cancer Institute, 2014). Women diagnosed with breast cancer have been identified as an at risk group for depression due to the extent of lifestyle alteration that the diagnosis can have on their life. Most people experience some degree of depression when they are diagnosed with cancer, this has been shown to be also evident in the breast cancer context.

As depicted by Coristine et al., (2003) caring for women with advanced breast cancer can have a psychosocial impact on caregivers. Five focus groups were held with caregivers (n=18) categorised as follows: spouses of the women (n=12), non-spousal caregivers (n=6) (this represented a son, daughter, sister or niece). Among the themes emerging from the study were the responsibility and need to protect the women, which were seen to impact on caregivers' health. The physical tolls of caring as well as the time involved were all mentioned by participants as affecting their mental state and quality of life.

While women with breast cancer have been shown to be at higher risks of developing depression, research has shown that partners of women are also more vulnerable to depression (Levy, 2011). However, the impact of psychological ailments experienced by significant others are less clear. Hasson-Ohayon et al., (2010) identified spouses as reporting more psychological distress (global depression and anxiety) than patients. Perceived support was seen as significantly effecting levels of distress, depression and anxiety both for patients and their spouses. Similarly, Northouse et al., (2010) studied the psychological needs of caregivers of cancer patients. Meta-analysis indicated that although interventions may have small to medium effects, they can significantly reduce caregiver burden, improve caregivers' ability to cope, increase their self-efficacy, and improve aspects of their quality of life. Interventions that help both caregivers and patients cope effectively and maintain their quality of life can be hugely beneficial to overall health outcomes.

The effect that the physical condition of breast cancer has on the mental health of the woman's partner was identified in a study by Dorros et al., (2010). This study investigated whether interdependence in dyads of partners and patients with breast cancer could lead to a crossover effect in outcomes. The sample consisted of 95 dyads of women with breast cancer (early stage) and their partners. By using reciprocal dyadic data from women with breast cancer and their partners, the study used the actor-partner interdependence model to examine the interaction between women's depression and stress, in predicting the health outcomes for their partners. This study suggests that an increase in psychological issues in women with breast cancer, correlated with increased physical issues for their partners. Results revealed that high levels of depression coupled with high levels of stress in women with breast cancer were associated with lowered physical health and wellbeing in their partners. Although depression was seen as the main component in predicting distressing outcomes, when depression was combined with additional stress in women, the level of physical distress was greater among partners. Results provided empirical support for crossover effects in the physical wellbeing of dyads. Furthermore, results showed that distressing outcomes are not limited to emotional distress but can also include physical distress. The findings from this study illustrate the need to consider the woman with breast cancer and her significant other in care, as a dyad.

A study by Bailey et al., (2010) using control groups attempted to determine if caregiving roles were associated with a risk of elevated depressed mood**,** using a sample of women diagnosed with breast cancer (n=1096). The Centre for Epidemiologic Studies Depression (CES-D) survey tool was used to measure depressed mood. Findings demonstrated that women with breast cancer, with multiple caregiving roles were more likely to report elevated depressed mood over time. The commitment of individuals to one or more caregiving roles was seen as negatively impacting on their psychological health. In addition, poorer adjustment and lower survival rates in those with multiple caring roles was also concerning. Relatives of breast cancer patients found themselves to be depressed, stressed, anxious, irritable, strained and fearful for the future. This highlights the impact that caring can have on both women with breast cancer and their significant others. In addition, overtime the continued act of caring is psychologically debilitating unless necessary interventions are available such as support, counselling, listening, advice etc. For women with breast cancer and their significant other the "relational support structure" has been identified as a potentially viable means of intervention (Bailey et al., 2010).

From the literature, depression and anxiety appear to be synonymous with each other. The presence of depression in women with breast cancer is considered to be influenced by family openness, communication and the degree of impact that the cancer has on the woman’s life (Sjovall et al., 2009). Women with breast cancer and their significant other are both potentially at risk of developing depression, with significant others often experiencing greater levels of depression and anxiety than women with breast cancer (Hasson-Ohayon et al., 2010). Depression is associated with poorer quality of life in women with breast cancer and their significant other (Sjovall et al., 2009). Where depressive symptoms are high, anxiety levels were also high (Gunnar et al., 2009).

In summary, in relation to breast cancer, the physiological responses and affective states of the individuals involved in the dyadic process of care appear to influence the overall outcome of the woman’s wellbeing. Consideration of the affect that breast cancer has on the significant other in the relationship is also evident. The main construct influenced by psychological health and affective states appears to be quality of life, for both women and their significant others. The literature is conflicting though and no clear direct relationship is apparent in terms of affective states and overall dyad functioning. The next section discusses health behaviour. The main health behaviour identified in the literature was adjustment. The concept of adjustment will now be discussed in the context of relevant studies.

3.6.3 Health Behaviour

While there are several health behaviours that can be applied to women with breast cancer and their significant other, for this discussion adjustment was identified as a key health behaviour in the empirical literature. Women with breast cancer can find it a challenge to adjust to a diagnosis, its treatments and the disease trajectory. Significant others may need to offer increased involvement to aid with this. However, significant others may also need extra support at this time. This will be discussed with relevant literature.

Adjustment

The National Cancer Institute (NCI) (2014) defines adjustment as a psychological adaption to cancer where the affected individual attempts to manage and control the confounding factors of the diagnosis. Adjustment is seen to be strongly correlated with coping and refers to an ongoing, continuous process. Successful adjustment is deemed achieved when the person with cancer limits the impact that the cancer diagnosis has on the normal functioning of their life. Although numerous elements can influence adjustment, individualistic components may also exist

Adjustment in breast cancer appears to be correlated with physical and psychological health. Ben-Zur et al., (2001) study aimed to assess similarities and differences between patients with breast cancer and their spouses in terms of coping strategies and adjustment to breast cancer and the pattern of relationships between the patients' and spouses' coping strategies and between each of these strategies and the women's adjustment to the illness using three types of models: patient, spousal, and dyadic coping. Women (n=73) with breast cancer and their spouses completed questionnaires that measured distress (Brief Symptom Inventory), psychosocial adjustment (MAC), and coping strategies. The study findings indicated that women's distress was greater than their spouses', but a similar level of psychosocial adjustment was seen in both. The women used more strategies involving problem-focused coping than their spouses. The use of emotion-focused coping (which included ventilation and avoidance strategies), was highly related to distress and poor adjustment on the part of the woman. The spouses' coping and distress were related to that of the women. Dyad emotion-focused coping measures were highly associated with the women's distress and adjustment to cancer. These findings demonstrate that spousal and dyad coping strategies are impacted on by the coping strategies of the woman with breast cancer.

Secondary data analysis conducted by Sherman et al., (2009), aimed to assess the degree of post-surgical adjustment and the impact of the patient-partner dyad showed similar results. In the study of patient-partner dyads (n=205), intimate (n=112), family (n=54) and non-familial (n=35), women with breast cancer experienced successful physical and emotional adjustment regardless of the type of dyad. The support, closeness and security provided within the dyad all aided in the woman's recovery. Women with no support or dyadic relationship may appear to be at a higher risk of mal-adjustment according to Sherman et al., (2009). Women with breast who are involved in better relationships and supported more have been found to exhibit better adjustment to breast cancer (Sherman et al., 2009). Thus, coping strategies, whether that of the woman, spouse or both (dyad) are important influencing factors in a women's adjustment to breast cancer.

Adjustment to breast cancer was also studied by Budin et al., (2008). The study described the necessary factors required in order for adjustment to a breast cancer diagnosis. Budin et al., (2008) used phase specific interventions on 249 breast cancer patient-partner dyads. The interventions were (a) disease management, (b) standardised psycho-education (SE), (c) telephone counselling (TC) or (d) SE and TC. The findings were indicative of the benefits of interventions and also reiterate the psychological, social, emotional and physical aspects of breast cancer. Targeting the interventions to both patient and partner was found as helpful. Those dyads who undertook the SE and TC intervention showed decreased levels of distress and severity but overall all three groups were suggestive of improved adjustment.

This section has outlined and reviewed the literature in relation to adjustment in a breast cancer context. In summary, adjustment is strongly related to physical and psychological wellbeing (Ben-Zur et al., 2001). Adjustment in breast cancer also appears synonymous with support from significant others and family (Sherman et al., 2009). Relationships where women and their significant others felt supported and involved were demonstrative of better adjustment levels. While adjustment is a key element in breast cancer context this can be difficult to assess at diagnosis stage due to the nature of adjustment occurring over a period of time. For this reason it was not included in the current study. Studies relating to health and disease outcomes will now be reviewed.

3.7 Health & Disease Outcomes

Health has been previously defined as more than the mere absence of disease, but the ability to maintain the normal functioning of regulatory systems (Lazarus and Folkman, 1984). This includes physical health, emotional health, mental health, psychological health and social health. Health of women with breast cancer has been linked with their quality of life (Hagerty-Lingler et al., 2008). The literature review presented correlations between the health status of the woman with breast cancer and her significant other. The focus in this section is on health and disease outcomes. It is proposed that the dyadic processes have an effect on the health status of the individuals and their outcomes (Pietromonaco et al., 2013). A concept that is closely linked with health status is quality of life. Quality of life is used extensively in literature to ascertain the impact of a condition on an individual.

Quality of life (QOL) is a term generally deemed to be related to how well an individual functions, however a clearer interpretation of QOL is the extent to which something impacts on the individuals' life. The World Health Organisation (WHO) (1997), defines QOL as "the individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (WHO, 1997 p. 2). It is a broad ranging concept affected by the person's "physical health, psychological state, level of independence, social relationships, personal beliefs and their relationship to salient features of their environment" (WHO, 1997 p. 2). This definition of QOL includes social relationships as an important factor to consider. QOL has been described as "a variable measure of both functional status and patient appraisal of how a health condition affects life" (Mayer and Grober, 2006 p 23).

Ganz at al., (2003) with a sample of women (n=691) over 65 years with breast cancer demonstrated that health is positively correlated with relationships. The study observed significant declines in the physical and mental health of older women in the 15 months after breast cancer surgery, whereas scores on a cancer-specific psychosocial quality of life measure improved over time. Predictive models indicate that older women with impaired physical functioning, mental health, and emotional social support after surgery have poorer self-perceived health and psychosocial adjustment one year later. Ganz et al.'s (2003) study linked support and quality of life. The way a couples' relationships works impacts on their illness and health. Furthermore, the illness and health of the individuals in the relationship affects the mediators and outcomes of the relationship.

The effect that interventions may have on health outcomes has also been highlighted. Northouse et al., (2010) tested the effect of a family intervention programme on the quality of life of cancer patients and their family caregiver. While the intervention group presented with less hopelessness and less negative appraisal the sustainment of results was not verified at the six month baseline. Northouse et al., (2010) also determined that while some interventions had small to medium effects, they significantly reduced caregiver burden, improved caregivers' ability to cope, increased their self-efficacy, and improved aspects of their quality of life.

More recently Northouse et al., (2013) examined whether patient–caregiver dyads (n=302) randomly assigned to a brief or extensive dyadic intervention had better outcomes than dyads randomly assigned to usual care and whether patients' risk for distress and other factors moderated the effect of the brief or extensive programme on outcomes. Three hundred and two dyads of patients and partners participated. Pre and post intervention (3 months) dyads completed the Risk of Distress Scale. The participants received brief and extensive programmes delivered by masters' level nurses. A follow-up home session lasting 90 minutes (2 x 30 minute phone sessions) was conducted. The results concluded that brief and extensive programmes can have a positive impact on the relationship of cancer patients and their partners. However, patients and caregivers may need basic personal, social and/or economic resources to benefit from time limited intervention.

Furthermore, Chou et al., (2012) examined the relationship between social support and survival among women diagnosed with breast cancer (n=584). The study was conducted over a 12.5 year period. Increased contact with friends and family post-diagnosis was associated with lower risk of death. It was highlighted that women with breast cancer need access to social networks and need to maintain relationship dynamics in order to preserve their normality and provide reasoning for life (Chou et al., 2012). Women expressed a desire to keep their relationship and also associated better QOL with positive relationships. This study illustrates the need for the patient – partner dyad to be considered. Sherman et al., (2009) found partners in intimate dyads with women with breast cancer at greater risk for emotional and social adjustment issues. The dyad of the woman and her partner was seen as influencing the emotional, physical and psychological wellbeing of the woman. Regardless of the type of dyad whether spousal, non-spousal, family member or friend, women with breast experience physical, emotional, social and physical benefits from being involved in a supportive dyad (Sherman et al., 2009).

Additionally, Lim (2014) investigated the relationship between coping, quality of life and dyadic communication, among breast cancer survivors and their families. Cross sectional surveys on a dyad sample (n=32) of breast cancer survivors and their family member were carried out. Quality of life (QOL) was intrinsically linked with communication and positive coping mechanisms. General communication between a family member and the breast cancer survivor was strongly linked with positive QOL outcomes for the family member also. Therefore, the dyadic relationship in breast cancer has been correlated with greater communication levels and as a result better QOL for both members of the dyad. Hence, following the findings of this study by Lim (2014), quality of life for the woman with breast can be identified as being intrinsically linked with communication within a dyadic relationship. This study identifies the important role that relationships (specifically dyadic ones) play in relation to improvements in quality of life for women within a breast cancer context.

In summary, defining quality of life is ambiguous within the current literature, several definitions appear that encompass numerous elements. For the purpose of the breast cancer context the concept of quality of life as relating to the physical, psychological, emotional and functional aspects of the individual (WHO, 1997) seems relevant. As the above studies demonstrate that the relationship dyad can have an effect on both the health and disease of the woman with breast cancer and her significant other. These effects can be positive or negative. Overall, dyadic processes including relationship behaviours, mediators and outcomes are strongly linked with health processes of physiological responses, affective states and health/disease outcomes. The literature review highlighted the nature of relationships and the important role they play in terms of quality of life within the breast cancer context. Relationships for women coping with breast cancer have been illustrated as being essential to better outcomes and overall indicative of better quality of life.

3.8 Limitations

The author acknowledges the limitations of the search strategy. The literature reviewed supported the concept of the existence of a relationship between women with breast cancer and their significant other(s). The themes following the review are consistent with the key concepts of Bowlby's attachment theory as depicted by Pietromonaco et al., (2013). The literature also identified numerous benefits of this relationship. The review supports the need for further research on women with breast cancer and their significant other due to the important role they play in breast cancer. The literature presented several gaps. While studies have been conducted exploring the relationship between women with breast cancer and their supportive person, the studies did not focus on the nature of the relationship specifically or use a theoretical framework as a working model. Few studies were found that considered the therapeutic properties of the relationship, although this was expressed by some women in studies as being essential. Studies focused on the support needs or wants of both parties (the woman with breast cancer and her significant other) but did not examine the effect that the relationship had on these support needs.

Studies identified various people who presented as "significant others". These were mainly spouses of the women or their children. Few studies specifically focused on non-family members as significant others, (i.e. friends, work colleagues) although they were identified as providing support for women who were not in intimate relationships. In many papers, the carer was synonymous with the partner or spouse, however many women identified the utilisation of other means of support i.e. friends, siblings, healthcare professionals. Regardless of the type of dyad (i.e. whether intimate or non-intimate), the supportive relationship was highlighted as being influential to the woman's care. The relationships that develop between non spousal carers and women with breast cancer may also provide useful knowledge to this topic area. The author is aware that literature focusing on the relationship between women with breast cancer and their children (<18 years) has not been explored in this review, however as the author is focusing on adult relationships this was considered beyond the scope of this review. Papers were focused on heterosexual couples, with only one study identified that explored same sex couples (Cochran and Mays, 2012). The relevance of health processes to health and disease in the breast cancer context is apparent. However, further research is necessary to clarify the link between dyadic processes and health processes for women with breast cancer and their significant other.

To reiterate, the key concepts that were identified and reviewed in the literature pertain to relationship orientation (i.e. attachment style), relationship behaviours (i.e. support, caregiving and social negativity), relationship outcomes (i.e. relationship satisfaction and responsiveness), relationship mediators (i.e. commitment, closeness and connectedness), affective states (i.e. anxiety and depressive symptoms), health behaviour (i.e. adjustment) and health outcomes (i.e. quality of life). These are evident in Figure 2.1. However following the literature review certain elements were seen as being more relevant and thus are focused on for the purpose of this study (Figure 3.2). For this study the key variables that were chosen to be measured were relationship orientation (i.e. attachment style), relationship behaviours (i.e. support seeking and receipt), relationship outcomes (i.e. relationship satisfaction), affective states (i.e. anxiety and depressive symptoms) and health outcomes (i.e. quality of life). These were selected as they were the most prominent in the empirical literature.

Summary

This section has reviewed the literature pertinent to women with breast cancer and their significant other, using Bowlby's attachment theory as a framework (as interpreted by Pietromonaco et al., 2013). The literature identified the need for further exploration of the relationship dyad that exists between women and their significant other throughout the breast cancer trajectory. With the realisation that women and their significant other deal with breast cancer interdependently, research that focuses on this dyad is particularly beneficial. Several key components that were identified by Bowlby (1969) and Pietromonaco et al., (2013) were evident in the literature.

The literature review identified the need for further research that explores dyadic relationships between women with breast cancer and their significant other as a dyad. Little research has been conducted that explores both the woman with breast cancer and her significant other in terms of relationships. The important role that relationships play in dealing with a breast cancer diagnosis was highlighted. Research has primarily focused on the impact of breast cancer on the individual. However, healthcare restructuring in Ireland (i.e. the reconfiguration of services for women with breast cancer from inpatient to outpatient settings) means that research that addresses the significant others is also essential to the overall enhancement of their care.

Exploring the relationship between women with breast cancer and their significant other(s) may provide insight into the dyad. An insight into the nature of the informal caring relationships that women with breast cancer experience would enhance healthcare professionals, specifically nurses' and oncologists', understanding of the crucial role that women's significant others play throughout their breast cancer illness trajectory (Pietromonaco et al., 2013). It is evident from the review that the Attachment Theory framework as depicted by Pietromonaco et al., (2013) would be applicable to the breast cancer context when exploring the relationship between attachment style, dyadic processes, affective states and health outcomes.

Research that explores and contributes to the understanding of the informal relationships among women with breast cancer may enhance our knowledge around dyadic processes and their impact on outcomes for these women. A breast cancer diagnosis not only affects the woman but also has a profound effect on the significant other. Within the literature both woman with breast cancer and their significant others have highlighted the need for care to incorporate spouses, family and friends who offer support to the woman during this time. Thus, a study that explores the influence of attachment style, dyadic processes, affective states on health outcomes for women with breast cancer and their significant other was undertaken.

This study is necessary for many reasons. Firstly, relationships have been identified as key influencing factors in terms quality of life. Secondly, both woman with breast cancer and their significant others have identified a need for care to be holistic and involve other members of the woman life and thirdly, a greater understanding of how relationships work specifically within a breast cancer context may guide future holistic care. In the following section the methodology for this study is presented. This study was guided by the key issues highlighted in the literature review. Following the review the framework (Figure 2.1) was adapted slightly (Figure 3.2) as certain elements were more prominent in the review than others. The next section presents the methodology for the study based on this framework.

Figure 3.2 Study Framework: Modified Attachment Framework Adapted for the Breast Cancer Context (I)

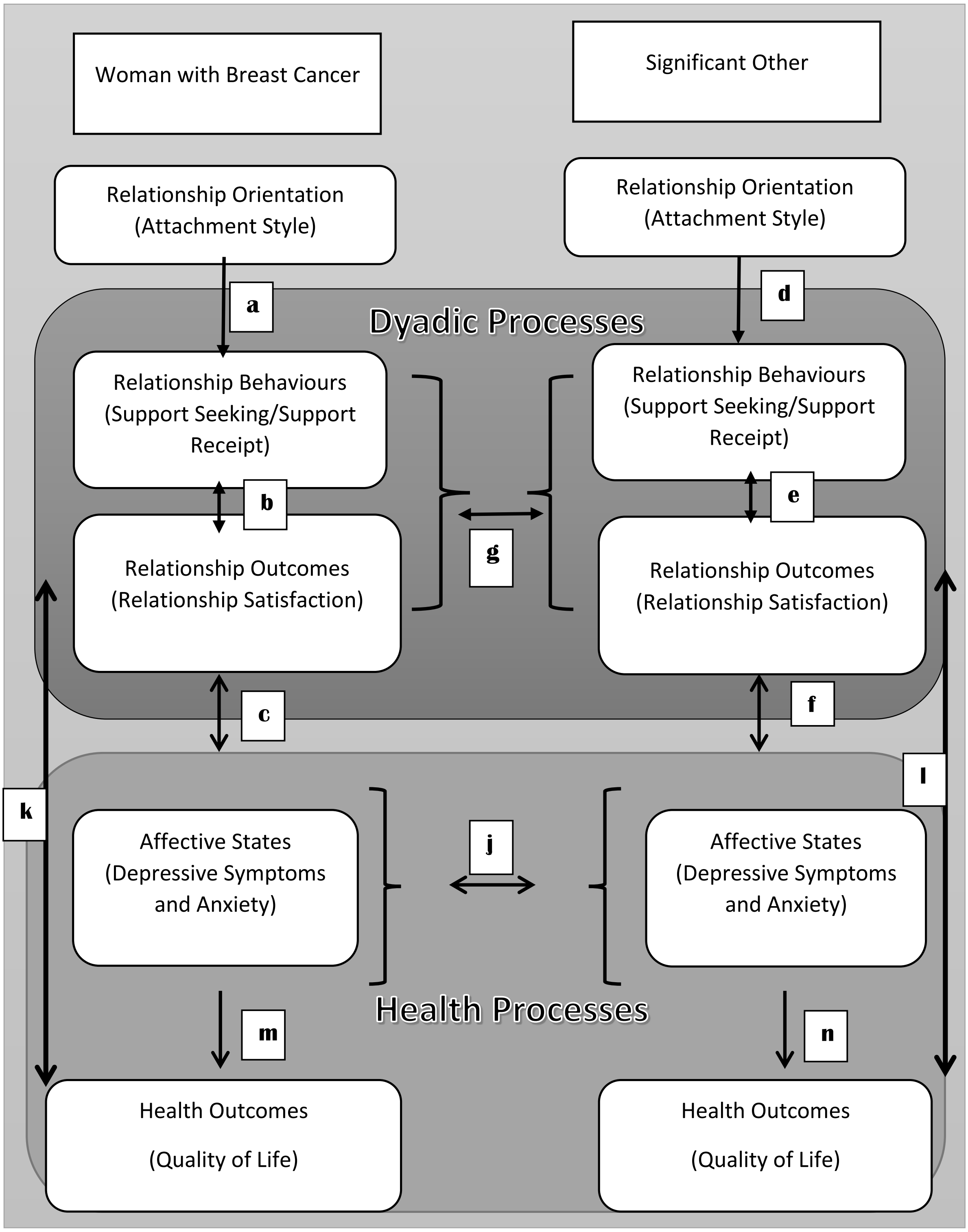


Figure 3.2 depicts the framework adapted following the literature review. As evident from the diagram it is a modified version of Figure 2.1 Pietromonaco et al., (2013), certain elements have been removed so as to ensure that the framework is applicable to the breast cancer context with the key concepts identified in the literature included, as determined by the empirical literature. This was done to ensure the applicability of the framework to this context.

Chapter IV Methodology

Introduction

This chapter outlines the methodology for a research study on women with breast cancer and their identified significant other. The study aim, objectives, design, instrumentation, sampling process, access and recruitment, data collection and analysis will be outlined in detail as well as ethical considerations. The study uses quantitative methods to ascertain the influence of attachment style, dyadic processes and affective states on health and disease outcomes for women and their identified significant other.

4.1 Aim

The aim of this study was to examine the influence of relationship orientation (attachment style), dyadic processes (relationship behaviours, relationship outcomes) and affective states (anxiety and depressive symptoms) on health outcomes (quality of life) for women with breast cancer and their identified significant other. The study used the principles of attachment theory (Bowlby, 1969) and was underpinned by a framework devised by Pietromonaco et al., (2013) (Appendix 4 and 12).

4.1.1 Objectives

The main objectives of the study were to:

1. Measure the relationship orientation (i.e. attachment style) of women with breast cancer and their significant other.

2. Describe the dyadic processes (relationship behaviours i.e. support seeking/support receipt and relationship outcomes i.e. satisfaction) of women with breast cancer and their significant other.

3. Measure the health processes (affective states i.e. depressive symptoms and anxiety) for women with breast cancer and their significant other.

4. Describe the health outcomes (i.e. quality of life) of women with breast cancer and their significant other.

5. Describe the association between select socio-demographics (i.e. age, gender, marital status, religion, ethnicity, education, employment, relationship of significant other and phase of treatment), relationship orientation (i.e. attachment style), dyadic processes i.e. relationship behaviours and relationship outcomes), affective states (i.e. anxiety and depressive symptoms) and health outcomes (i.e. quality of life) for the woman with breast cancer and her identified significant other.

Data were analysed at the individual level (i.e. the woman with breast cancer and significant other individually) and subsequently as a dyad 9i.e. the woman with breast cancer and her nominated significant other). .

4.1.2 Hypothesis

Hypotheses fall into two categories; these can be directional or null. For this study the null hypothesis was used. Thus, the study aimed to show that no relationship existed between the variables. The null hypothesis was used as opposed to a directional one as all research aims to disprove or reject the null hypothesis. This study has several hypothesises. These are:

(H1) There is no association between relationship orientation (i.e. attachment style) and health outcomes (i.e. quality of life) for women with breast cancer and their significant other (Figure 4.1, H1).

(H2) There is no association between relationship behaviours (i.e. support) and health outcomes (i.e. quality of life) for women with breast cancer and their significant other (Figure 4.1, H2).

(H3) There is no association between relationship outcomes (i.e. relationship satisfaction) and health outcomes (i.e. quality of life) for women with breast cancer and their significant other (Figure 4.1, H3).

(H4) There is no association between affective states (i.e. depressive symptoms and anxiety) and health outcomes (i.e. quality of life) for women with breast cancer and their significant other (Figure 4.1, H4).

(H5) There is no association between relationship orientation (i.e. attachment style), dyadic processes (i.e. relationship behaviours, relationship outcomes) affective states (i.e. anxiety and depressive symptoms) and health outcomes (i.e. quality of life) for women with breast cancer and/or their significant other (Figure 4.1, H5).

4.2 Overview of Theoretical Framework

The attachment theory which underpins this research study focuses on the concept that attachment bonds form within all relationships including dyadic relationships between women with breast cancer and their significant other, as a result of this an attachment style develops (Bowlby, 1969). This attachment style can influence the life of the person and affect their ability to maintain secure relationships throughout their lifespan (Bowlby, 1969). While initially explored and discovered in the mother-child context, as identified through the empirical literature, the need to feel safe, secure and protected, which is key to attachment theory is also evident in the breast cancer context (Fagundes et al., 2014). A framework based on Bowlby's (1969) attachment theory developed by Pietromonaco et al., (2013) forms the basis of this study (Figure 4.1).

This framework depicts that dyadic processes which occur within close proximate relationships can influence health processes. Dyadic processes relate to relationship behaviours (which for this study is support seeking/receipt) and relationship outcomes (i.e. relationship satisfaction). Dyadic processes are seen to be key in relationships in terms of determining how both individuals act within the relationship. The health processes refers to affective states (i.e. depressive symptoms and anxiety). Affective states are seen as being crucial to health outcomes, with depressive symptoms and anxiety identified as influencing factors for health and wellbeing (Coristine et al., 2003). This framework attempts to explain how health outcomes including quality of life can be influenced by relationship orientation, dyadic processes and affective states. Thus, although quite a complex framework it provides a basis for assessing the key constructs which were identified in the literature review.

As some elements of Pietromonaco et al's., (2013) framework were more prominent in the literature review and others less so, the researcher adapted the framework (Figure 4.1), to measure the key concepts in this study. The behaviours including caregiving, commitment and social negativity were not included as variables in the study due to their application to more intimate partner relationships and violent or abusive relationships and the literature identified that women with breast cancer may have significant others with whom they are not intimately involved, these were not measured. Adjustment and stress were not included as adjustment tends to occur over a period of time and requires two time points to be adequately assessed. As some of the women in the study were approached at diagnosis the likelihood of them depicting an accurate adjustment to the diagnosis and/or treatments at this stage is unlikely. Stress was not included due to the wide spectrum of causes, symptoms and outcomes it can present with which were beyond the parameters of this study. However, future uses of this framework could incorporate stressful responses to a breast cancer diagnosis as a measurable variable.

Key variables included in this study were relationship orientation (i.e. attachment style), relationship behaviours (i.e. support seeking and receipt), and relationship outcomes (i.e. relationship satisfaction), affective states (i.e. anxiety and depressive symptoms) and health outcomes (i.e. quality of life). The definitions of these variables are detailed in the next section.

Figure 4.1 Study Framework: Modified Attachment Framework Adapted for the Breast Cancer Context (II)

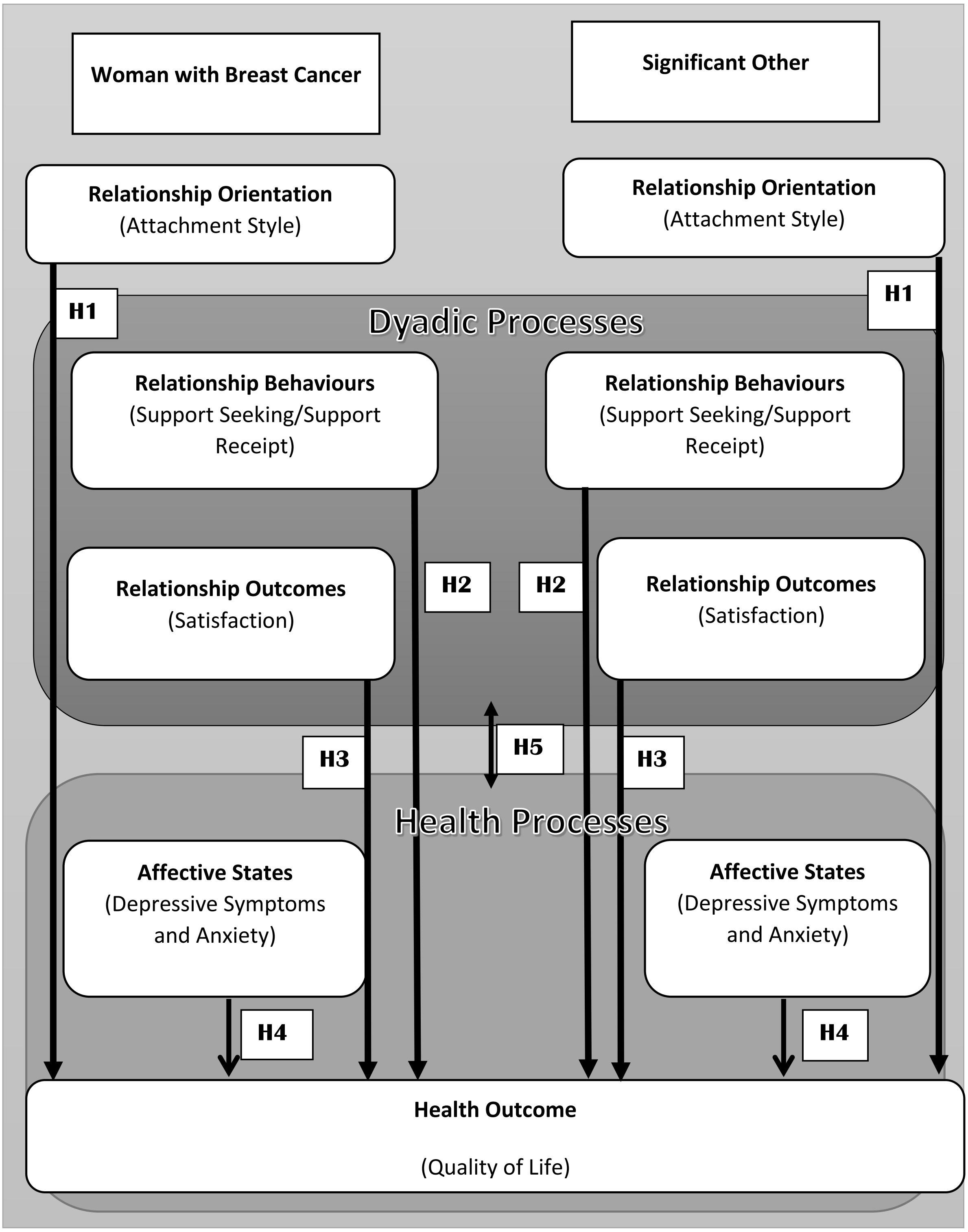


Figure 4.1 depicts the framework used in this study. As evident from the diagram it is a modified version of Figure 3.1 Pietromonaco et al., (2013), certain elements have been removed so as to ensure that the framework is applicable to the breast cancer context and to ensure feasibility of the study. It is a simplified version of the framework to make the operationalising of the study within the timeframe, feasible.

4.2.1 Operational Definitions

The operational definition is the clear definition of a variable that translates the variable into a working format to facilitate the collection of numeric or measurable data (Parahoo, 2014). The first variable measured is attachment style.

Relationship Orientation (Attachment Style): Conceptual Definition

Bowlby (1969) initially defined attachment style as a tie or bond between a mother and child that exists to ensure safety and proximity to the primary carer (i.e. the mother). In more recent times, theoretical and empirical literature has resulted in attachment style being broadened to relate to a bond or connection between two individuals (not solely defined as parent and child). The uses of attachment theory within romantic/peer relationships, addiction, psychology, coping and chronic illness (Bartholomew, 1990; Kirkpatrick and Shaver, 1992; Priel and Shamai, 1995; Birnbaum et al., 1997; Kirkpatrick, 1998) has led to the widening of the conceptual definition. In the adult context four main styles of attachment have been identified, these are: secure, anxious–preoccupied, dismissive–avoidant, fearful–avoidant.

While attachment style is a well-defined concept, there is debate within current literature as to whether it remains stagnant or changes over time (Main and Solomon, 1986; Mikulincer and Shaver, 2007). Many researchers consider attachment style as being developed in childhood and remaining unaltered throughout the life cycle, others however, argue that attachment style can change depending on the type of relationship one is in and the attachment style of the significant other (Mikulincer and Shaver, 2007).

Operational Definition

The definition of attachment style as a close bond between two individuals involved in a relationship is the definition used in this study. Various tools have been developed to assess attachment style. These include both interview style formats as well as questionnaires. Bartholomew and Horowitz (1991) used Ainsworth's (1978) model to create the Relationship Questionnaire (RQ). The RQ consists of four statements relating to attachment style: Secure, Dismissive, Preoccupied and Fearful.

Relationship Behaviours (Support Seeking and Support Receipt Behaviour): Conceptual Definition

Support seeking relates to the act of an individual requesting support via verbal communication or nonverbal communication means and the receiving of that support (Levy, 2011). Support receipt behaviours refers to how an individual acts towards receiving support (Levy, 2011). This is seen to relate to the woman and her significant other seeking support from each other whether consciously or subconsciously, as well as the receipt of that support.

Operational Definition

For the purpose of this study support seeking and support receipt behaviours were defined as the way the woman with breast cancer and her significant other go about asking for and receiving support. Support seeking and support receipt behaviours were measured with the Berlin Social Support Scale (Schulz and Schwarzer, 2003b).

Relationship Outcome

Relationship Satisfaction: Conceptual Definition

Satisfaction is the sense of feeling happy due to having ones' wishes, needs or desires fulfilled (Fishbein and Ajzen's, 1975). The literature suggests that relationship satisfaction is related to how content one is in their current relationship with another (Manne et al., 2004).

Operational Definition

For this study, satisfaction relates to the level of contentment or happiness with the current state of the relationship between the woman and her significant other. Satisfaction will be operationalised using the satisfaction subscale from the Investment Model Scale (Rusbult, Martz and Agnew, 1998).

Affective States (Anxiety and Depressive Symptoms)

Anxiety: Conceptual Definition

According to The American Heritage Medical Dictionary (2007) anxiety refers to a state of uneasiness and apprehension, uncertainty and fear resulting from the anticipation of a threatening event, often to a degree that normal physical and psychological functioning is disrupted (The American Heritage Medical Dictionary Copyright, 2007). Anxiety has been associated widely with the breast cancer context as many women diagnosed with breast cancer experience the feeling of distress or anxiousness throughout their care process.

Depressive Symptoms: Conceptual Definition

Depressive symptoms represent the persistent feelings of sadness and worthlessness and a lack of desire to engage in formerly enjoyable activities (Raiikkonen et al., 2007). Depressive symptoms can affect the body, mood, and thoughts. Depressive symptoms can interfere with the individual's daily life, normal functioning, and cause pain for both the person with the symptoms and those who care about him or her. These symptoms include feelings of helplessness and hopelessness, loss of interest in daily activities, appetite or weight changes, sleep changes, anger or irritability, loss of energy, self-loathing, reckless behaviour etc. (Raiikkonen et al., 2007). As evident in the empirical literature, depressive symptoms such as tiredness, loss of interest, low mood, and irritability can greatly influence the relationship of the woman with breast cancer and her significant other.

Operational Definition

Depressive symptoms in this study are defined as feelings of low mood, worthlessness, low self-esteem and/or loss of self-identity. Anxiety will be defined as the persistent feelings of inner turmoil or nervousness in this study. Depressive symptoms and anxiety will be measured with the Hospital Anxiety and Depression Scale (HADS) (Zigmond and Snaith, 1983). This fourteen item scale is widely used to determine the levels of anxiety and depression that patients experience. The scale has 7 items applicable to anxiety and 7 items measuring depressive symptoms. Each item is scored 0-3 resulting in a total score of 0-21 for either anxiety or depressive symptoms.

Health Outcome (Quality of Life): Conceptual Definition

Quality of life as a concept pertains to the wellbeing of the individual. According to Ravens-Sieberer and Bullinger (1998) quality of life can be viewed as "*a psychological construct which describes the physical, mental, social, psychological and functional aspects of wellbeing and function from the patient's perspective*" (Ravens-Sieberer and Bullinger, 1998 p. 399). In the literature the quality of life of women with breast cancer is seen as synonymous with that of their significant other (Chen et al., 2004; Avis et al., 2007; Awadalla et al., 2007; Lindholm et al., 2007; Hopkinson et al., 2012; Leow et al., 2013; Lund et al., 2014).

Operational Definition

In this context, quality of life will be referred to as the wellbeing of the women with breast cancer and her significant other, consisting of physical, psychological, social, emotional, and functional aspects of health (Avis et al., 2007). Quality of life was assessed using two instruments one for the woman with breast cancer, The Functional Assessment to Cancer Therapy Scale-Breast (FACT-B) and for the significant other The Functional Assessment to Cancer Therapy-General Population (FACT-GP) was used (FACIT, 2014). These instruments both originate from the same developers and are easily used together as the FACT-B consists of the FACT-GP with ten additional items added, relating to symptom concerns experienced when dealing with breast cancer.

4.3 Research Design

When considering the design of a study it is important to consider the research question as this determines the most suitable research method. Research predominantly aims to explore new areas of knowledge in an attempt to further increase our level of understanding (Polit and Beck, 2012). There are primarily three ways of conducting research i.e. qualitative, quantitative and mixed methods approaches. The latter is a combination of the first two designs. This study applied a quantitative approach, testing hypothesis in relation to a theory through variables (Creswell, 2013). According to Aliaga and Gunderson (2000) quantitative research is "research that explains phenomena by collecting numerical data, which is analysed using mathematically based methods (i.e. statistics)" (Aliaga and Gunderson, 2000 p.1).

In quantitative research the primary aim is to determine if there is an association (either positive or negative) between an independent variable(s) and a dependant variable in a given population (Northouse, 1989; Northouse et al., 1998; Parahoo, 2014). Quantitative research uses statistical, numerical or computer data and can be descriptive (where a sample is accessed, data collected and the results described in detail), non-experimental (where participants are not involved in any tests or trials) or experimental (where participants are accessed before and after treatment or a trial) (Parahoo, 2014). This study was non-experimental in design. In this type of research hypotheses are tested using phenomena as they occur naturally, where there are no other variables introduced. Quantitative research essentially involves three categories these are descriptive, correlational or causal (Parahoo, 2006).

Correlational research uses data analytical techniques to determine the extent of an association between two or more variables with statistical tests (Parahoo, 2014). While correlational design offers an effective research method for a non-obtrusive format to the inquiry and is beneficial in identifying associations between variables (Finlay, 1999; Creswell, 2009), firm definitive causations cannot be assumed from the results (Parahoo,

2014) rather it is concluded that an association is likely. Thus, whist correlational design is a validated method used to explore associations between variables, experimental designs tend to give more concrete evidence in support of correlations between variables (Parahoo, 2014). However, as this is a relatively new area of study with little existing research conducted on dyads within a breast cancer context, utilising a correlational design may provide further hypothesis development for future studies in this context (Creswell, 2013; Parahoo, 2014). This study seeks to explore how certain variables are associated with QOL for both the woman with breast cancer and her significant other.

Descriptive correlational studies are common in nursing research and whilst they may not provide definitive conclusions they do offer a greater understanding of phenomena (Parahoo, 2014). Descriptive studies have several important roles in nursing research and are useful ways of exploring a new concept or inquiry (Grimes and Schulz, 2002). Advantages of descriptive studies include a focus on the person which is central to this study. However, descriptive studies have been noted to be limited in their results as they often simply describe the phenomena with no causal inferences being concluded (Groves et al., 2013).

In quantitative correlational research the most common format for gathering data is surveys or questionnaires. Survey research is a structured way of providing a numeric, description of trends, attitudes or opinions for a given sample in a formalised manner, in order to gain data about them or their experiences (Parahoo, 2014). It includes cross sectional or longitudinal design (Creswell, 2013). Cross-sectional studies provide an instant view of the population at a particular time (Parahoo, 2014). Cross sectional descriptive correlational studies aid in identifying relationships between independent variables (i.e. attachment style, relationship behaviours, relationship mediators, affective states) and an outcome variable (i.e. quality of life) for women with breast cancer and their self-identified significant other(s). In contrast to lengthier longitudinal studies, cross sectional studies are limited in the fact that there is not a continuous measurement of the population over time, and hence the results are only applicable to that population at that given time, thus results are not generalizable (Creswell, 2009; Creswell, 2013).

Advantages of survey design include ease of use and administration, administration to a broad population, thus allowing the collection of a vast amount of data, as well as numerous questions pertaining to several issues e.g. attitudes, beliefs, behaviours being obtained at one time (Parahoo, 2006). This is essential to this study as the relationship orientation, dyadic processes, affective states and health outcomes of women with breast cancer and their significant others are being investigated at the same time within the same questionnaire to reduce stress and burden on the woman with breast cancer and her significant other. The most prevalent tools used in survey design research are questionnaires (Parahoo, 2014). Questionnaires are useful in providing data to support or reject hypotheses. While observational studies are seen as the gold standard in assessing behaviours and attributes, feasibility of this is problematic (Parahoo, 2014). Thus, questionnaires tend to be utilised more in health science research as they allow for the study of phenomena that may improve care delivery and outcomes (Creswell, 2013).

While surveys are hugely beneficial for studies exploring several elements at once there are disadvantages to them. These include non-response resulting in missing data (Parahoo, 2006), participants not providing honest or accurate responses (Boynton and Greenhalgh, 2004), and close ended questions providing little option for participants to divulge why they answered a certain way (Parahoo, 2014). As this study's primary objectives are centred on identifying attachment styles, relationship behaviours, health behaviours as well as health outcomes, a questionnaire is an appropriate means of collecting data. The instruments utilised in the questionnaires for this study have all been previously developed and used in existing studies, are validated and reliable, offering standardisation and comparison with other studies (Boynton and Greenhalgh, 2004), which is a key factor in research design.

Thus, for this study a quantitative descriptive correlational survey design was used as it was deemed as an appropriate method for generating insightful information, on the key elements that may affect health outcomes for women with breast cancer and their significant other(s). A questionnaire pack using various scales was developed to ascertain information from the participants regarding their lifestyle, employment status, education, relationships, as well as data relating to the attachment style, relationship behaviours, relationship outcomes, affective states and their quality of life.

As seen in Figure 4.1 the core principles devised by Pietromonaco et al., (2013) are relevant to the breast cancer context. This study uses this framework as a guide. The study (1) assessed the attachment style of the woman with breast cancer and her significant other, (2) assessed support seeking and support receipt behaviours, (3) evaluated relationship outcomes and affective states, in an attempt to determine the effect that the above variables have on health outcomes as depicted by quality of life.

4.4 Research Instruments

Following review of several instruments (Appendix 11) and using Leary's (1995) protocols for designing questionnaires whilst also considering Dillmans (2000) approach to questionnaire design, the researcher devised a questionnaire pack for both the woman with breast cancer (Appendix 21) and her significant other (Appendix 22) using existing validated instruments. Table 4.1 a and b depicts the instruments used in this study including the constructs being measured, associated concepts, number of items in each scale, the response format, the scoring and range of values, the validity of the instrument, the reliability and its suitability to this study.

Construct (*associated concept)*	**Instrument and Reference**	**Number of Items**	**Response Options**	**Directions for scoring, range and interpretation of scores**	**Validity**	**Reliability (Cronbach alphas scores)**	**Suitability to study** **1. measurement in dyadic context** **2. reliability and validity in other studies** **3. clarity of instrument** **4. brevity of instrument**
Relationship Orientation (*Attachment Style)*	The Relationship Questionnaire (RQ) Bartholomew and Horowitz (1991)	8 items 2 parts- (1) Select most appropriate style from 4 (2) rate on Likert scale.	Tick the box from a choice of 4 statements, Then indicate level of correspondence with each statement on Likert scale from 1-7, 1=strongly disagree to 7=strongly agree	4 paragraphs the participants tick which one best describes them. Then participant rates each of the same paragraphs on a scale of 1 to 7. Scores from the 1-7 scale are added together using formula (StyleA+ StyleD)–(StyleB+Style C). Scores from the above calculation are used to determine the model of Self scores and Model of Other scores which are used to classify attachment style in terms of anxiety and avoidance.	Validated the attachment questionnaire in 62 cultures (Schmitt, D.P., et al.,2004) and Holmes BM, and Lyons-Ruth K.,2006)	0.72 to 0.96 (Scharfe and Bartholomew, 1994)	1=yes (couple research 2= yes (variety of validated studies) 3=yes (instructions inform respondents at start what to do, easily formatted) 4=yes (covers main aspects of attachment style).
Relationship Behaviours (*Support Seeking/ Support Receipt)*	Berlin Social Support Scale Schwarzer and Schulz (2013)	24 items 6 subscales Used 3 in this study: Actual Support Support Seeking Need for support as study concerned with support seeking behaviours not social support.	4 point Likert scales Responses rated from 1-4, 1=Not at all true 2=Barely true 3=Moderately true 4= Exactly true	Some items reverse coded Total score is accumulation of all subscales Scale Need for Support marked range 0-16 Support Seeking 0-20 Actual received/provided Support 0- 56 (reverse scoring for some items)	Shown in Schulz and Schwarzer, (2003) used to assess support (social) in sample of cancer patients (n=457) and Schulz and Schwarzer (2004) (n=108) patients following tumour surgery	Each of the subscales have has proven reliability in studies 0.63 to 0.83 (Schulz and Schwarzer, 2003)	1=yes (in couples and cancer) 2= yes (extensively used) 3=yes (clear mark the box) 4=yes (applies to all aspects of social support). Can use subscales to assess specific aspects of support. used in experimental, longitudinal, cross sectional studies
Relationship Outcomes (*Relationship Satisfaction)*	Investment Model Scale Rusbult, Martz and Agnew (1998)	4 items	9 point Likert scale from 0-8, 0=do not agree at all to 8= agree completely.	Total score for satisfaction subscale is out of 32. Range 0-32. Higher score indicates greater level of satisfaction with relationship.	Good to strong validity in Rodrigues and Lopes, (2013; 2017) in a correlational study on intimate relationships.	0.92 to 0.95 Good test retest reliability 0.82 (Impett, Beals And Peplau, 2001)	1=yes(couples relationship) 2= yes (used in relationship research) 3=yes(easily utilised and clear) 4=no (not very extensive only covers satisfaction as relating to 4 items).

Table 4.1a Depiction of constructs, variables and instruments of the study.

Construct (*associated concept)*	**Instrument and Reference**	**Number of Items**	**Response Options**	**Directions for scoring, range and interpretation of scores**	**Validity**	**Reliability (Cronbach's alphas scores)**	**Suitability to study 1. measurement in dyadic context 2. reliability and validity in other studies 3. clarity of instrument 4. brevity of instrument**
Affective States (*Depressive symptoms and Anxiety)*	Hospital Anxiety and Depression Scale (HADS) Zigmond and Snaith (1983)	14 items- 7 items depressive symptoms (HADS-D) and 7 items anxiety (HADS-A)	4 point Likert scale 0-3 rate responses to each statement. Range is from 0-21 for each of the scales. Thus, can get a score out of 21 for anxiety and out of 21 for depressive symptoms, Higher score indicates more anxiety or depressive symptoms present	0-3 score for each item. Total score out of 21 for both Depressive symptoms and Anxiety. 0-7= normal, 8-10 =mild, 11-14=moderate, 15-21=severe levels of anxiety/depressive symptoms. Some items involve reverse scoring.	Validated in symptom severity and cases of anxiety disorders and depression (Bjelland et al., 2002)	0.63 to 0.93 (HADS-A) 0.67 to 0.90 (HADS-D) (Bjelland et al., 2002)	1=yes(but not used extensively in dyad context) 2= yes (widely used) 3=yes(clear and precise) 4=yes (covers anxiety, depression and emotional distress).
Health Outcome (*Quality of Life(QOL))*	Functional Assessment to Cancer Scale- Breast (FACT-B) Functional Assessment to Cancer Scale- General (FACT-GP) www.facit.org	FACT-B 37 items 5 subscales FACT-GP 27 items, 4 subscales	5 point Likert Scale, from 0-4, 0= Not at all to 4= Very much Participants rate how much they agree with each statement.	Negatively worded items were recoded, higher score indicates a better QOL. On both the FACT-GP and FACT-B. Range of scores for FACT-GP 0-108 for all 4 subscales on Physical wellbeing, social wellbeing, functional wellbeing and emotional wellbeing. Some items require reverse scoring. The FACT-B total score is the sum of all five subscales the above 4 with the additional concerns subscale (BCS) also. Range is from 0-148. Some items on the BCS are reverse scored before calculating	English version of the FACT valid, responsive, and reliable in assessing health-related quality of life in breast cancer patients (Ng et al., 2011)	FACT-B 0.63 to 0.86 (Brady et al., 1997) FACT-G 0.90 (Costet et al., 2005)	1=no(not used in dyad) 2= yes (used extensively in chronic illness) 3=yes (clear instructions) 4=yes (4 subscales for each aspect of quality of life).

Table 4.1b Depiction of constructs, variables and instruments of the study.

4.4.1 Concept: Relationship Orientation (Attachment Style)
Instrument: The Relationship Questionnaire (RQ)

When considering a measurement tool to classify the relationship style of a particular dyad, the theoretical literature provided a good insight into which tools may be beneficial. The first questionnaire that was used to measure attachment style was developed by Hazan and Shaver (1987). This questionnaire classifies adult attachment styles (identified by Ainsworth, 1978) into three categories (secure, avoidant (fearful) and anxious/ambivalent (preoccupied). An important development in attachment questionnaires was the addition of a fourth style of attachment by Bartholomew and Horowitz (1991). Bartholomew and Horowitz's (1991) questionnaire considers that the perspective of others' influence how individuals define their attachment style. The four categories presented by Bartholomew and Horowitz (1991) include the above three with the addition of "dismissive" (sometimes referred to as dismissive-avoidant) as an attachment style.

In the current study, attachment style was assessed using The Relationship Questionnaire a scale consisting of 8 questions based on Bartholomew and Horowitz (1991) classification of attachment styles. The scale has 2 parts. Firstly, participants were asked to read four statements each depicting an attachment style (secure, fearful, preoccupied, and dismissive). They were then asked to place a mark next to the statement that they thought best describes them in terms of their relationship with their significant other. Then this scale asks participants to rate from 1-7 their level of agreement with each of the four statements, 1=do not agree at all to 7=strongly agree. Scores were calculated through adding up the values and performing a simple equation calculation (Figure 5.1 and 5.2). This scale describes two things. Firstly, the self-identified relationship orientation (attachment style i.e. secure, fearful, preoccupied, and dismissive) of the women with breast cancer and her significant other. Secondly, the Model of Self/Model of Other which indicates the level of avoidance and anxiety with regard to relationships. Model of Self is an indicator of a person's anxious levels in terms of relationships and forming them. Model of Others is an indicator of a person's avoidance levels in relation to forming bonds or attachments. A secure attachment style is indicated by low anxiety (low score of Model of Self) and low avoidance (low score on Model of Others). Preoccupied attachment styles are indicated through high anxiety and low avoidance. Avoidant attachment styles are categorised as high anxiety and high avoidance. Finally, dismissive attachment style is indicated by low anxiety and high avoidance (Figure 5.4).

This tool was selected for the study as it: 1) categorises attachment style 2) encompasses a measure of all four attachment styles 3) is specific and precise, thereby reducing the time factor for participants and reducing any misunderstandings and 4) has been used extensively in previous research (Bartholomew and Horowitz, 1991; Griffin and Bartholomew, 1994; Bartholomew and Shaver, 1998). The instrument has been proven to have good construct validity and reliability and is suitable for use with two people in a relationship. The scale was completed by both the woman with breast cancer and her significant other.

4.4.2. Concept: Relationship Behaviour (Support Seeking/Support Receipt) Instrument: The Berlin Social Support Scale

The Berlin Social Support Scale devised by Schulz and Schwarzer (2003b) measures support receipt and support seeking behaviours. It assesses perceived emotional support, the need for support, support seeking, actual received support, satisfaction with support receipt, and protective buffering using a 4 point Likert scale. The scales contain elements for completion by the support recipient and the support administrator. Thus, it ensures both perspectives are assessed. The scale consists of 6 subscales with items assessing both individual and dyadic support behaviours. Information is ascertained on how individuals behave in terms of seeking and receiving support from others.

Participants are required to answer questions pertaining to how they perceive their significant other responds to their needs as well how they perceive they respond to the needs of their significant other. The instrument is considered to have good reliability with internal consistency for 6 subscales in validated samples (cancer patients, n=457): Actual Perceived Support (8 items); Cronbach's alpha = 0.83; Actual Received Support (general score, 11 items): Cronbach's alpha = 0.83; Need for Support (4 items): Cronbach's alpha = 0.63; Support Seeking (5 items): Cronbach's alpha = 0.81; Protective Buffering (6 items): Cronbach's alpha = 0.82; Internal consistency for Provided Support (11 items) in partner sample (n=175 spouses) Cronbach's alpha 0.75 (Schulz and Schwarzer, 2003a; Schulz and Schwarzer, 2003b).

As the current study is concerned with ascertaining information regarding support seeking and support receipt behaviours this scale was seen as applicable to the context, however as this scale assesses social support only certain subscales which were relevant to the study construct of support seeking/receipt were selected for inclusion in the study pack. The subscales of Actual Received/Provided Support (19 items), Need for Support (4 items) and Support Seeking (5 items) were used.

4.4.3. Concept: Relationship Outcome (Relationship Satisfaction)
Instrument: The Satisfaction Subscale of Investment Model Scale

Funk and Rogge (2007) present a critical examination of two instruments used to measure relationship satisfaction, including the Marital Adjustment Test (MAT) (Locke and Wallace, 1959) and the Dyadic Adjustment Scale (DAS) (Spanier, 1976). These self-report measures were given to 5,315 participants. Using item response theory, Funk and Rogge (2007) demonstrated that the MAT and DAS provided relatively poor levels of accuracy in assessing satisfaction, especially when considering the number of items that the scales contained. Compared with the MAS and the DAS, the Couples Satisfaction Index (CSI) scale was shown to have higher precision of measurement and correspondingly greater power for detecting differences in levels of satisfaction (Funk and Rogge, 2007). However, this scale focuses on couples as an intimate dyad and as previously discussed, within the breast cancer context dyads are not always involved in intimate couple relationships.

Impett et al., (2001) tested the reliability of the Investment Model Scale on a sample of 3,627 couples. The tool demonstrated that partners' satisfaction was intrinsically linked with predicting commitment to the relationship. Multiple growth path analysis revealed the instrument was an adequate and reliable tool for determining associations between variables (Impett et al., 2001). Therefore, in this study satisfaction subscale from the Investment Model Scale (Rusbult et al., 1998) was used to measure relationship satisfaction. This scale assesses the amount of positive versus negative effects that an individual experiences in a relationship (not solely intimate) and determines to what degree the partner of the individual fulfils their needs (Rusbult et al., 1998). The measure consists of four items assessing satisfaction. Reliability of the scale (Cronbachs Alpha) ranges between 0.92-0.95 (Rusbult et al., 1998). The scale is quite short which was identified as a potential issue however, inter item correlation demonstrated it as being reliable for the current study (Fincham and Rogge, 2010).

4.4.4. Concept: Affective States (Anxiety and Depressive Symptoms) Instrument: The Hospital Anxiety and Depression Scale (HADS)

As the concepts of anxiety and depression are often seen as symbiotic, anxiety and depressive symptoms are closely associated and can often occur together, as well as being researched together quite extensively, the Hospital Anxiety and Depression Scale was used to assess levels of anxiety, depressive symptoms and emotional distress in this study. Developed by Zigmond and Snaith (1983) the scale is a 14 item self-assessment questionnaire which generates ordinal data. The scale consists of statements that the participant rates on a Likert scale 0-3. The anxiety and depressive symptoms components are categorized separately from each other. This means that the participants can score between 0-21 for both anxiety and depressive symptoms. A score of >11 is considered to be indicative of anxiety or depressive symptoms (Bjelland et al., 2002; Hinnen et al., 2007).

The tool was selected as it: (1) is primarily used as a research tool with individuals with physical chronic conditions including breast cancer and control groups (2) is simple and brief (3) has been widely accepted (acceptability) (4) is completed by the individual participant themselves (5) provides a clear indication of depressive symptoms, anxiety or emotional issues over a period of one week. Results of numerous studies using HADS indicate that there is good test-retest reliability (Bjelland et al., 2002; Hinnen et al., 2007; Vahdaninia et al 2010). A systematic review (Bjelland et al., 2002;) found that when compared to other questionnaires for anxiety and depression such as the Becks Depressive Inventory and the State-Trait Anxiety Inventory, the correlation to HADS-D and HADS-A, respectively, were between 0.60 and 0.80, which can be characterised as medium to strong correlations. The same level of correlations was found when HADS-D was compared to the Montgomery Asberg Depression Rating Scale. Hence validity of HADS was rated “good” to “very good” (Bjelland et al., (2002). Hence, a review of instruments concluded that HADS has good test-retest reliability (Bjelland et al., 2002) when used in similar context to this study i.e. cancer.

4.4.5. Concept: Health and Disease Outcome (Quality of Life)

Instrument: The Functional Assessment to Cancer Therapy Scale (FACT) for use with Breast Cancer Population (FACT-B) and General Population (FACT-GP)

Quality of life (QOL) measures have become a vital and often required part of health outcomes appraisals. This is especially significant to individuals living with a chronic disease. Measurement of QOL provides a way of determining the impact of healthcare practices (Cella and Tulsky, 1993). At present there is no gold standard for measuring the quality of life of women with breast cancer. While the definition of QOL is still evolving, Revicki et al., (2000) define QOL as encompassing a “broad range of human experiences related to one's overall wellbeing, based on subjective functioning in comparison with personal expectations and is defined by experiences, states and perceptions and is idiosyncratic to the individual” (Revicki, et al., 2000 p. 888).

General QOL scales may provide means of comparing women with breast cancer with other populations however, issues that are specific to breast cancer sufferers may not be well represented on general quality of life scales. In determining which scale would best suit this study several possible scales were considered (Appendix 11). For this study The Functional Assessment of Chronic Illness Therapy- Breast (FACT-B) was used for the woman with breast cancer and The Functional Assessment of Chronic Illness Therapy- General (FACT-GP) for their significant other to ascertain QOL scores (FACIT, 2014). Both these instruments are part of The Functional Assessment of Chronic Illness Therapy (FACIT) Measurement System. This system is a collection of health-related quality of life (HRQOL) questionnaires focusing on the management of chronic illness. Whilst the FACT-GP is a multidimensional instrument, the method of patient review used in developing the FACT-GP has resulted in an instrument with less emphasis on physical and functional domains than other QOL measures such as those in the EORTC QLQ (FACIT, 2014). The FACT-B was developed with an emphasis on patients' values and brevity (FACIT, 2014).

The scales were developed through standard scale development and validation methodology incorporating 4 phases: item generation, item reduction, scale construction and psychometric evaluation (FACIT, 2014). Both patients and expert healthcare professionals were consulted in the development phases of the instrument. Semi-structured interviews were performed to elucidate opinions and experiences of both individuals dealing with cancer and expert group. The items generated from the interviews were reviewed and reduced based on patient and expert ratings and item quality (FACIT, 2014). All the FACIT instruments have undergone assessments of reliability and validity using a minimum sample of 50 patients. The validation of the instrument includes a baseline assessment followed by test-retest to determine if a change occurred over time (FACIT, 2014). The FACIT assessment systems have been used in patients with cancer and demonstrated good reliability (Guillemin et al., 1993; Guyatt et al., 1993; Brady et al., 1997; Costet et al., 2005).

The FACT-General Population (FACT-GP) consists of 27 items within four validated subscales (Physical Well-Being, Social/Family Well-Being, Emotional Well-Being, and Functional Well-Being). The FACT-B consists of the FACT- GP (4 subscales) with the addition of the Breast Cancer Subscale (BCS), which complements the general scale with items specific to QOL in the breast cancer context. The BCS is comprised of ten items specific to QOL in breast cancer. The 37-item self-report instrument was designed to measure multidimensional QOL in patients with breast cancer.

The FACT-B has been established as being appropriate for use in oncology clinical trials, as well as in clinical practice (FACIT, 2014). It demonstrates ease of administration, brevity, reliability, validity, and sensitivity to change. The alpha coefficient (internal consistency) for the FACT-B total score is considered high (alpha = 0.90), with subscale alpha coefficients ranging from good to very good, 0.63 to 0.86 (FACIT, 2014). Evidence supported good test-retest reliability, as well as convergent, divergent, and known groups' validity (Brady et al., 1999). Two validation samples were used. The first (n=47) was tested twice over a 2-month period to assess the instruments sensitivity to change. Significant sensitivity to change in performance status rating (PSR) was demonstrated for the FACT-B total score, the Physical Well-Being (PWB) subscale, the Functional Well-Being (FWB) subscale and the Breast Cancer Subscale (BCS). Sensitivity to change in QOL measured by the Functional Living Index- Cancer (FLIC) was documented in the FACT-B total score, PWB, FWB, and Emotional Well-Being (EWB). Additional validity and reliability data were obtained from a larger sample (n = 295). The alpha coefficient (internal consistency) for the FACT-B total score was high (a = 0.90), with subscale alpha coefficients ranging from 0.63 to 0.86 (Brady et al., 1999).

In summary, the instruments used in this study are all previously and extensively used. Figure 4.2 contains a detailed depiction of the study concepts. Reliability and validity of the instruments was a key factor in deciding on their inclusion in the questionnaire. The instruments utilised in this study all presented with evidence of use in similar contexts and were relatable to the key constructs being investigated in this study. The next section details the socio-demographics that are pertinent to this study.

Table 4.2 Representation of Study Concepts and Instruments

Construct	**Relationship Orientation**	**Relationship Behaviours**	**Relationship Outcomes**	**Affective States**	**Health Outcomes**
Associated Concept	Attachment Style	Support Seeking/ Support Receipt	Relationship Satisfaction	Depressive Symptoms and Anxiety	Quality of Life
Dimensions	1. Secure 2. Preoccupied 3. Fearful 4. Dismissive	Support seeking and support receipt	Satisfaction with Relationship	Depressive Symptoms and Anxiety	1. Physical Wellbeing 2. Social Wellbeing 3. Functional Wellbeing 4. Emotional Wellbeing 5. Additional Concerns (Woman with Breast Cancer)
Scales	Relationships Questionnaire (RQ)	Berlin Social Support Scale Subscales (BSSS)	Satisfaction subscale of The Investment Model	The Hospital Anxiety and Depression Scale (HADS)	Functional Assessment to Cancer Therapy-Breast (FACT-B) (woman with breast cancer) Functional Assessment to Cancer Therapy-General (FACT-GP) (significant other)

Table 4.2 shows the constructs being measured in the study, their associated concepts, and the scales which are part of the overall questionnaire package.

4.4.6 Demographics

Within the questionnaire package demographic information was gathered in order to gain a demographic picture of the sample. Demographic information consisting of age, gender (significant other only), marital status, religion, ethnicity, education, employment status, relationship of significant other and phase of treatment (woman with breast cancer only), were collected using a standard questionnaire. The above categories for demographics and associated questions were adapted from the Central Statistics Office (CSO) (2014) as well as supported by literature relating to the use of using demographics in conducting surveys in the breast cancer context (Osborn et al., 2006; Weber, 2010). The woman with breast cancer and her significant other were also asked to specify the nature of their relationship to each other e.g. spouse, sibling, child, parent, relative, friend or other in an attempt to categorise the characteristics of the significant other.

4.4.7 Survey Package Design

Following consultation with experts in survey design and using the literature reviewed, a questionnaire package was designed considering Dillmans Total Design Survey Method principles for surveying (Dillman, 2000). The questionnaire had an illustrated front cover (butterfly image) and contained specified instructions about how to complete the questionnaire. The consent form was in simple jargon free English language and was suitable to 5th grade reading level. The cover letter clearly described the purpose of the study and explained why the participant was chosen to partake. The researcher considered the layout, clarity, font (size was 12, black, Times New Roman) as in accordance with literature on designing questionnaires (Dillman, 2000; Dillman et al., 2014). The questions were structured in a logical layout beginning with the socio-demographics. Each variable being assessed was considered within a section of the questionnaire. Contact details from respondents were collected on the questionnaire for further contact if required as well as a postage paid return envelope for returning completed questionnaires. Questionnaires were pre numbered with codes for anonymity purposes and to allow for grouping of paired couples for the dyad element of study.

4.5 Research Population and Sampling

4.5.1 Breast Cancer in Ireland: A Population Perspective

Within Ireland there are currently 25,000 women living with a breast cancer diagnosis (Europa Donna Ireland, 2014). Incidence rates project 1 in 8 women will be diagnosed with some form of breast cancer (NCRI, 2014). Ireland is ranked as the country with the second highest incidence of breast cancer within Europe (Europa Donna Ireland, 2014). Every year over 2,600 women are diagnosed with breast cancer in Ireland (WHO, 2011). The numbers of breast cancer diagnoses are expected to rise for future populations (WHO, 2011). The increase in these figures are essentially attributed to early detection rates with screening programmes as well as Ireland's ageing population demographic. The risk of developing breast cancer increases with age. In Ireland, the highest incidences of breast cancer diagnosis across all stages are within the over 50 year age category (NCRI, 2013). Seventy five percent of breast cancers are diagnosed over the age of 50 and 37% in women over 65 (Europa Donna Ireland, 2014). The majority of women diagnosed worldwide are in the low to middle income economic bracket (WHO, 2011).

In Ireland, a two route system for breast care exists. This incorporates the symptomatic aspect where women may present to a GP with symptoms and the screening process whereby a woman presents for regular mammogram and irregularities are interpreted (Health Service Executive, 2016). As these services are both catered for in the breast care centre of an acute care hospital setting in the south of Ireland, the researcher collected data from women with a self-discovered symptom as well as those identified through screening.

4.5.2 Target Population

The target population for this study was women over the age of 18, living in the south of Ireland, availing of services from a designated centre of excellence, with a diagnosis of primary breast cancer, who were about to undergo surgery or were currently involved in treatment. Women with breast cancer attending a pre assessment clinic or an outpatient clinic within the hospital who met the inclusion criteria were approached and invited to partake. The woman with breast cancer was asked to nominate a significant other for participation in the study. The women were informed that this individual could be any person whom they considered to be a significant person in their care. The inclusion of members of the social network other than spouses was allowed as empirical studies within the literature support the view that women may have other means of support than spousal. In addition, women may have a spouse but might not identify them as the significant other in their care (Grunfeld et al., 2004).

4.5.3 Sampling Technique

The use of a sample to obtain information based on a given population has been proven to be an effective sampling technique (Yu and Cooper, 1983), however although sampling provides an easier, more feasible method of data collection, sampling has been shown to be only effective if done so as to limit as many potential flaws as possible. A consecutive sampling technique was applied to this study, thus all eligible participants were invited to partake until the sample required was reached. Argued to be the most effective non probability sampling technique (Parahoo, 2014), consecutive sampling attempts to limit bias and is a strict version of convenience sampling, giving a good representation of the overall population (Groves et al., 2013). However, consecutive sampling is limited in that it does not allow for randomization. In addition, recruiting a sample until the required sample size is reached can be lengthy and may mean that certain participants are more in favour of being involved in research than those who decline (Parahoo, 2014). This type of sampling involved the sample being recruited consecutively from a target population which was easily accessible, readily available and convenient.

4.5.4 Sample Size

The aim of the research was to investigate factors associated with quality of life (dependent variable) of women with breast cancer and their significant other. Regression analyses was used to investigate the relationships between socio-demographic variables, dyadic processes (relationship behaviours, relationship outcomes), relationship orientation (attachment style), health processes and health and disease outcomes (quality of life). Separate regression analyses will be performed for women with breast cancer and significant others. In a multiple linear regression, a sample size of 127 participants would be sufficient to detect a medium effect (f2=0.15) with up to 12 independent variables, with a power of 80%, a level of significance of 0.05 and a 2-tailed test. Hence, 127 women with breast cancer and 127 identified significant others are required for this study. The sample size calculation was performed using the G-Power 3.1 program2 (Cohen, 1992; Erdfelder et al., 1996). Inclusion criteria for the women for the study were as follows:

- Be over 18 years
- Have a primary diagnosis of breast cancer, based on the histologic result of a biopsy
- Be preparing to undergo surgical treatment at some stage in their care trajectory, currently involved in treatment for breast cancer or attending follow up appointments for breast cancer treatment (could be up to five years following diagnosis).

Inclusion criteria for the significant other were that they were:

- Over 18 years
- Nominated by the woman with breast cancer as a significant other
- In a pre-existing relationship with the woman (formal or informal, intimate or non-intimate).

Note: significant other was described to the women as the person who they feel is most significant to their care at the time of questionnaire completion.

4.6 Recruitment and Access of Sample

(I) Recruitment

For this study participants were accessed from an acute breast care centre located in the south of Ireland. The hospital is an acute centre of excellence that includes a specialised breast cancer centre supplying services to the greater southern area. As Ireland has two ways of diagnosing women with breast cancer (screening and symptomatic) both the services that provide for screening and symptomatic assessment of women breast cancer were accessed. Figure 4.2 depicts the data collection process.

(II)Access

Access to the sample was obtained with the assistance of the Clinical Nurse Specialist (CNS), and Oncologists. Eligible women were informed at their consultation with their clinician about the study. The CNS identified eligible women (i.e. women with a primary breast cancer diagnosis) and distributed the information leaflets at the time of diagnosis informing them that they may be approached at their clinic appointment and invited to partake in the study. In order to protect the woman’s anonymity and confidentiality the researcher had no access to the medical records of the women. Subsequently, women were approached by the researcher in the clinic of the hospital and invited to partake.

Following agreement to participate, the women were asked if they were able to identify a “significant other”. This term was explained to the woman as the person who they feel was most influential or important to their care at that time. If the woman could not identify a significant other but still wanted to partake in the study a questionnaire pack was given to her. This data was then used in the “woman only” sample. Regarding women who did not have a significant other with them at the clinic, the researcher asked if they would be happy to give the survey package to their significant other and post it back to the researcher in a pre-addressed postage paid envelope.

Formal written consent was obtained by the researcher (for both the woman and her significant other) (Appendix 19). Once the woman with breast cancer agreed to partake in the study, the researcher provided her with a questionnaire package x 2, one for herself and one for her significant other containing further information on the study. The women were reassured that the study was in no way connected with their treatment and that participation was voluntary. As the study required the woman and her significant other to be linked as a dyad, a coded numbering system, where questionnaire for woman number one was (W001) and for her significant other was (S001) and so on, was used.

Reducing attrition is key to ensuring accurate high quality data in a study. Dillman (2000) depicts a 5 contact method to aid in reducing attrition. Data collection and follow-up procedure were performed in accordance with Dillman’s (2000) steps. Two weeks after the initial questionnaire a reminder (telephone/postal) was sent. For non-responders a further reminder was carried out at 4 weeks. Dillman's methods can be seen to be quite rigid, as often the recommended 5 points of contact with participants is not feasible in research, specifically in the case of women who were immediately post diagnosis and may be already quite busy attending clinics and appointments. However, utilising aspects of Dillman's (2000) steps can enhance response rate (up to 80%) and reduce attrition as well as drop out. A response-maximizing approach to surveys, articulated by Dillman and colleagues (Dillman et al., 2014.), includes up to five contacts with survey recipients, stamped return envelopes, personalized correspondence and a token of financial incentive, however this study consisted of 3 points of contact (Figure 4.2) with participants due to limited time and access, although clinicians within the setting had more regular contact with the woman with breast cancer. Further contact may have increased response rate, although for this study it was deemed as being satisfactory when compared with similar studies (Quinn et al., 2009).

Reducing attrition can be done by maintaining contact with the participant(s) through obtaining their contact details at the initial meeting (Parahoo, 2014). Utilising reminders either by post or telephone can also aid in reducing attrition (Parahoo, 2014). Women were asked at their clinic appointment if they were happy to give their contact details to the researcher and for the researcher to contact them as a reminder. For participants who had not returned the questionnaire, a reminder was sent in the post, two weeks after the women received the questionnaire, to both the woman and her significant other and again at 4 weeks (Dillman, 2000). Other ways of reducing attrition included building a rapport with participants, accessing participants at a time suitable to them and ensuring the questionnaire is easily completed (Dillman, 2000). Thus, for this reason the questionnaire design was a key component. The tick box answering format of the questionnaire and short questions were chosen to ensure as little time as possible was required to complete it. As suggested by Dillman et al., (2014) questionnaires should be 12 pages approximately. The one used for this study was between 11 and 13. Participants were informed that the questionnaire could be taken home and completed in their own time also reduce attrition.

In the case of a woman whose significant other dropped out of the study for any reason, the data collected from the woman was analysed separately and used in the data relating to the women (n=147). Socio-demographic information was analysed to describe the commonalities between those who remained in the study thus, providing a profile of participants. Whilst comparison between completers and non-completers was not possible due to the researcher having no access to information about the non-completers, comparisons between the information obtained on both the women with breast cancer and their significant other is presented in detail.

4.7 Data Collection

Data collection involved several steps (Figure 4.2). Data was collected using a multi-scale questionnaire package distributed to the sample population. A consecutive sample of women and their identified significant other were given the self-report questionnaire at a pre-assessment clinic or at an outpatient clinic appointment, usually 7-9 days post diagnosis. The researcher liaised with the CNS's who aided in identifying eligible women meeting the required criteria. The researcher (1) asked the CNS's to distribute the leaflet providing information on the study to the eligible population group at their clinic appointment (day of diagnosis); (2) approached the women at the pre-assessment clinic and informed them of the study and gained consent; (3) identified if their significant other present, if present informed them about the study and gave the questionnaire to them, if significant other was not present, the researcher asked the woman if she was happy to take the questionnaire and give it to her significant other; (4) administered the questionnaire package; (5) gathered data and analysed the results. The researcher commenced data collection in late October 2015 and completed it in early September 2016.

In an attempt to minimise misinterpretation the researcher stated to participants that she was available if needed to clarify any issues. Contact details of the researcher were also provided in the pack (Appendix 20). Participants were informed about the nature of the study i.e. regarding the need for a postal questionnaire to be completed by both the woman with breast cancer and her significant other. For non-respondents the researcher contacted the women and significant other 2 weeks post giving them the questionnaire as a gentle reminder to return the questionnaire (Figure 4.2). The questionnaire packs included a pre-addressed postage paid envelope as well as the consent forms, information leaflet and contact details for cancer services within the hospital i.e. Pastoral Care, Voluntary Cancer Support Organisations.

Figure 4.2 Flow Diagram Representation of Data Collection

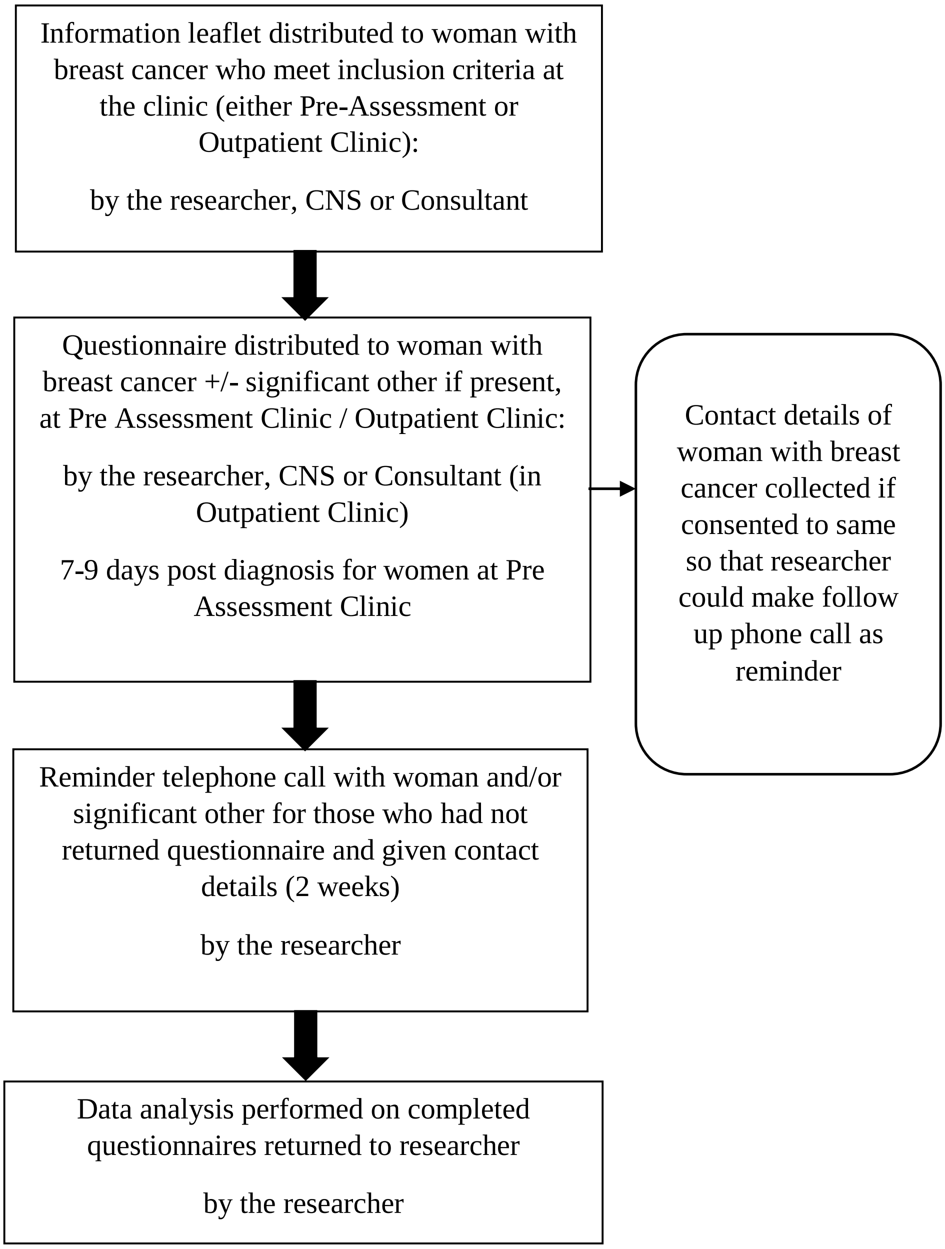


Figure 4.2 illustrates the steps involved in the data collection phase of the study, women with breast cancer (n=250) were accessed and invited to partake in the study from two clinics (pre-assessment clinic and outpatient clinic) within one acute urban hospital with specialised breast cancer services. Pre Assessment Clinic women with breast cancer were 7-9 days post diagnosis and pre surgery. Outpatient women with breast cancer were currently involved in treatment.

4.7.1 Project Management

In developing the data collection process the researcher is aware that certain factors need consideration. These include cost, time, consistency and availability of assistance.

(1) **Cost:** Printing costs were considered due to the sample size in this study. Statistician consultancy fee was also an expense so as to ensure effective data collection methods.

Travelling between the Pre Assessment and Outpatient clinics did not require extra expense due to both being located within the same hospital. However, parking costs were budgeted for due to the researcher requiring to be on site in one of the clinics Monday to Friday from 08:30 to 17:00. A budget was used to estimate costs.

(2) **Time:** The amount of time it can take to collect data is often unknown at the start of research (Grove et al., 2013). Regarding time, data collection time can take weeks, months or even years to gather the data. The amount of time the participant needs to invest and the feasibility of the survey being completed within a certain period of time needs to be considered. Data collection took eleven months. This was primarily due to the intensity of collecting data from dyads as well as conducting research with a vulnerable sample group, where sensitivity is essential.

The pilot study was beneficial in highlighting potential problem areas within the survey design and data collection procedure. The researcher needed to ensure that participants had sufficient time within the setting to be informed about the study. The busy nature of the environment meant that often the researcher only had 15 minutes to talk to the woman in the side room between being seen by their consultant or other HCP's. Allowing participants to take the questionnaire home overcame this problem as well as providing all the contact details of the researcher and informing the women that they could contact the researcher if any questions. To facilitate women who wanted to complete the questionnaire within the clinic while they waited, a sealed box was placed in the clinic on a shelf with a notification on the front stating "research study questionnaires".

(3) **Consistency:** Maintaining a degree of consistency or uniformity throughout the data collection process involved ensuring that the survey was distributed in the same manner to all participants. As the researcher was administering the questionnaires within the pre

assessment clinic this was not an issue, however in the outpatient department often the questionnaire packs were distributed by the consultant or the CNS. The consultant and CNS's met with the researcher and discussed the questionnaire packs as well as completion details. This minimised the level of discrepancy.

(4) **Availability of Assistance**: As the sample in this study is often seen by on site specialists including consultant, pathologist and CNS, the researcher utilised these resources. The CNS's were involved in discussing the best way to approach the women with breast cancer at the clinic. The researcher was given a list of eligible women attending the pre-assessment clinic/outpatient clinic in the morning on each day. Once the women came to the pre-assessment clinic the researcher approached them, introduced herself, and asked them if they were interested in participating in a study, agreeable participants were invited to accompany the researcher to a side room where the researcher discussed the study in more detail. A further information leaflet consisting of a more detailed account of the study and consent form was given to the women. The women were asked to identify their significant other and asked if the person was there with them at the clinic. This was to ensure that there was: (1) prior awareness of the study, (2) accurate informed consent and (3) maintenance of privacy and confidentiality.

4.8 Validity

Validity is broadly defined as the insurance of soundness in a study (Shuttleworth, 2008). Validity can be seen to be intrinsically linked with the design and methods of the research. Therefore, appropriate design of the study is essential to ensuring that the question asked is what is answered (Shuttleworth, 2008). In this study validity of each individual scale was ascertained prior to selecting. Validity is associated with (1) the rigor applied to the conducting of the study (2) the extent of explaining results by other casual relationships. Validity is the proof that the study findings are valid. In research it is recommended that attention is paid to both external and internal validity (Grove et al., 2013). External validity refers to generalisation of the result i.e. can the findings be transferred to all similar population groups (Campbell and Stanley, 1966). Internal validity refers to how valid the study is in relation to being reflective of the real world without confounding factors. Shadish et al., (2002) cited by Groves et al., (2013) describe three types of validity; (1) internal validity, (2) external validity and (3) face validity. These will now be discussed in detail outlining how they were achieved in this study.

4.8.1 Internal Validity

Internal validity is the degree to which the results of the study are reflective of the real world as opposed to being caused by extraneous variables such as environment. In combating the problem of extraneous variables, the researcher must ensure that the only plausible explanation for the correlation is the dependant variable. The participant selection process can also impact on internal validity. This study used a non-probability consecutive convenience sample which offers better internal validity than a selected sample (Grove et al., 2013).

4.8.2 External Validity

External validity relates to the generalizability of the findings i.e. can the results be applied beyond the sample group and remain accurate and true (Grove et al., 2013). Usually, initial studies on topics have quite low generalizability factor due to the absence of replication studies. Threats to external validity include sample selection i.e. certain individuals may be more predisposed to participating in studies than others, for this reason the study needs to be as time efficient as possible and limit the demands placed on participants. One way of achieving this is through using a questionnaire package that does not take a lot of time and is user friendly. The questionnaire used in this study consisted of tick the box, rating on a Likert scale and answering yes or no formats which are conducive to time management. Although a large number of scales are contained within the survey package due to the number of variables being assessed, previous studies have been conducted using similar survey packages with good responses (Velikova et al., 1999; Quinn et al., 2009; Fagundes et al., 2014).

4.8.3 Face Validity

Face validity was achieved through peer reviewing of the questionnaire package and pilot testing. Face Validity for the study was done using a peer group to assess the questionnaire package prior to the pilot study commencing. Peer reviewing, using a series of questions (Appendix 16), asking reviewers (n=4) a number of questions about the questionnaire and their experience of completing it, (Appendix 21 and 22) was conducted. The group were asked to identify any issues or problems they experienced with the questionnaire package. The group consisted of peers and experts in the oncology field. This method has been used widely to ascertain the degree of purpose that the survey has i.e. do the questions fit the associated concepts. The questionnaire package was distributed to a group of peers (n=4) who then completed a face validity instrument (Appendix 16). This group consisted of clinicians (n=2) and academics (n=2) in the field of oncology. Peers (n=4) were asked if the aim of the study was appropriately addressed. There was overall agreement that it was. The results showed that the instrument itself appeared quite complete. The questionnaire addressed five of the six variables being measured very well (n=4) with one participant stating one variable (quality of life) was only somewhat addressed. Some minor issues were raised regarding wording of questions. These were addressed as detailed below.

Additionally, a small group of women who had previously been diagnosed and treated for breast cancer completed the questionnaire (n=6) (Appendix 21) and gave feedback using a brief survey (Appendix 15). Following the peer review and face validity test the following edits were made to the questionnaire:

I. Question 6: working for payment/ profit removed the word “profit” as deemed confusing and unnecessary

II. Question 8 and 9: wording in question clarified as terms have been presented in segments to make it easier to read and interpret. Participants stated appeared too cluttered on page, spacing used to amend this.

III. Question 11: “it is important for me always to have someone who listens to me” changed to “it is important for me to always have someone who listens to me” as wording deemed confusing.

IV. Question 40: “I get a sort of frightened feeling” was changed to “I get a frightened feeling” as wording was deemed confusing.

V. Question 45: “I feel as if I am slowed down” was changed to “I feel as if I am slower doing things” as wording deemed confusing.

VI. Question 52: “I have a lack of energy” was changed to “I have less energy than before” as wording deemed confusing.

VII. Question 57: “I feel ill” was changed to “I feel generally unwell” as most participants stated that they think “ill” would relate to physical illness only and not relate to general wellness.

VIII. Question 79: “I have been short of breath” was changed to “I have experienced shortness of breath”.

IX. At the end of the questionnaire it was recommended to remove the term “if agreeable” as completion of the questionnaire would imply this.

4.9 Reliability

Reliability is the ability for repetition of the study to be conducted resulting in the same conclusions being achieved when the same methods and conditions are adhered to (Shuttleworth, 2008). This means that the hypothesis that has been proven in one study is applicable to the wider population group. The main way of achieving reliability is to select tools that have been well used in the research field (Groves et al., 2013). The reliability of the scales in this study are depicted in Table 4.3.

Ensuring rigor with quantitative research involves strict accuracy, attention to detail and precision (Grove et al., 2013). In this study, rigour was achieved with the strict selection process involved in choosing the measurement scale used for the study. The researcher had specifically opted to use existing instruments with good reliability for this study. In previous research the Cronbach alpha scores for each instrument was greater than 0.8. Strategically coding the questionnaire packs and entering data in a cohesive manner also increases reliability of a study.

One limitation of Cronbach alpha is that its value depends on the number of items in the scale/subscale (John and Benet-Martinez, 2000). The Cronbach alpha scores for some of the subscales in this study were low (Table 4.3), of particular interest the HADS, HADS-A (anxiety) (0.51-0.58) and HADS-D (0.50-0.53), which was surprising given its previous use in similar contexts. Although scores for scale reliability were low and in contrast to the existing literature, Love, Kissane, Bloch and Clarke (2002) in their investigation of the efficiency of the HADS tool in patients with breast cancer, reported that it may not be effective for use in this sample. Rationales for this may be due to the use of a psychological based instrument within a medical population (Love et al., 2002). Hence, mean inter item correlation (MIIC) is also presented. Clarke and Watson (1995) suggest an average inter item correlation lies between the ranges of 0.15 to 0.50 (Table 4.3).

Table 4.3 Table of Reliability of Instruments Used In Study

Scale	Cronbach's α	Mean Inter Item Correlation (MIIC)
Relationship Questionnaire (select from categories)	N/A	N/A
Berlin Social Support Scale (Overall)	0.82(W) 0.76(S)	0.21(W) 0.16(S)
Need for Support Subscale (4 items)	0.73 (W) 0.57(S)	0.40(W) 0.12(S)
Actual Support Subscale (19 items)	0.84(W) 0.72(S)	0.25(W) 0.24(S)
Support Seeking Subscale (5 items)	0.86(W) 0.805(S)	0.55(W) 0.34(S)
Relationship Satisfaction (4items)	0.63(W) 0.43(S)	0.3(W) 0.10(S)
Hospital Anxiety and Depression Scale (Overall)	0.81(W) 0.66(S)	0.16(W) 0.16(S)
HADS_A Anxiety (7 items)	0.58(W) 0.51 (S)	0.08(W) 0.13(S)
HADS_D Depressive Symptoms (7 items)	0.50(W) 0.53(S)	0.30(W) 0.12(S)
Functional Assessment to Cancer Therapy-General Population FACT_GP(Overall) (27 items)	0.84(W) 0.50(S)	0.12(S)
Physical Wellbeing Subscale (PWB) (7 items)	0.81(W) 0.55(S)	0.38(W) 0.06(S)
Social & Family Wellbeing Subscale (SFB)(7 items)	0.64(W) 0.70(S)	0.21(W) 0.32(S)
Emotional Wellbeing Subscale (EWB) (6 items)	0.59(W) 0.89(S)	0.19(W) 0.67(S)
Functional Wellbeing Subscale (FWB) (7 items)	0.85(W) 0.79(S)	0.50(W) 0.43(S)
Functional Assessment to Cancer Therapy-Breast FACT_B (Overall) (37 items)	0.84(W)	
Additional Concerns Subscale (woman with breast cancer only) (10 items)	0.52(W)	0.90(W)

Table 4.3 depicts the reliability of the scales in terms of Cronbach alphas and mean inter item correlation. The inter-item correlation was also performed for values with lower Cronbach alpha and is reported. (W)= woman with breast cancer scale, (S) = significant other scale

4.10 Ethical Consideration

The moral obligation of researchers to ensure that their work is both morally and ethically sound has been identified as essential to high valued, respected research (Clarke, 1991; Grove et al., 2013). Grove et al., (2013) describe the regulations outlined by the Health

Insurance Portability and Accountability Act (2003). The major ethical issues in conducting nursing research while they may vary, are considered to be centred around: a) autonomy, b) informed consent, c) beneficence- do not harm d) respect for anonymity and confidentiality and e) respect for privacy (Hunt, 1992; Beauchamp and Childres, 2001; Johnstone, 2009; Fouka and Mantzorou, 2011). These principles are discussed with reference to this study.

(1) Right to Self Determination (Autonomy)

Based on the right for respect, this principle maintains that study participants have a right to make autonomous decisions in a free, self-controlling manner (Grove et al., 2013). This principle was achieved by ensuring prospective participants were informed of the study in detail (Fouka and Mantzorou, 2011), able to voluntarily participate and make the decision for themselves of their own free will (Clarke, 1991; Burnard and Chapman, 2005). This principle is violated when coercion, bribing manipulation or deceiving of the participants occurs (Parahoo, 2014). The researcher ensured that the participants were capable of giving informed consent in a voluntary manner (Appendix 19). All participants were over 18 and able to give consent.

Participants were given the choice to voluntarily participate in the study. Information about the study was given prior to the distribution of the questionnaire pack and potential participants were informed that non participation had no impact on their care. Regarding women with breast cancer who were newly diagnosed, participants received an information leaflet on the day of their diagnosis, approximately 7-9 days prior to their pre assessment clinic visit. This timeframe was chosen as it aided in the processing of the information and prevented participants being rushed into making a decision. In terms of women with breast cancer who were accessed via the outpatient clinic, the CNS and the consultant informed them about the study at their clinic appointment. Participants were allowed to take the questionnaire pack away with them for consideration, thus allowing them further time to process the information on the study so that they could make an informed, autonomous decision about partaking or not.

(2) Right to Privacy

Privacy is the individual's right to their personal information being protected (Grove et al., 2013) and the individual having control over when their information is shared. Participants' right to privacy was maintained as only the Clinician and the CNS had access to the women's medical records. Participants who were agreeable to being contacted were followed up with by the researcher. Women and their significant others were asked if their responses could be used in the study discussion including presentation and publications but assured that anonymity would be maintained with the use of anonymised codes. The data collected were securely stored on university premises in accordance with guidelines and will remain so for a period of seven years (Data Protection Acts 1988 and 2003; University College Cork, 2016).

(3) Right to Anonymity and Confidentially

Confidentiality involves the researcher ensuring that although the identity of the participants is known, it is not shared or disclosed to others (Grove et al., 2013). The participants were not identifiable to anyone and the researcher could only contact them for additional information if they completed the consent form and when they gave explicit consent to be contacted. This study contained identification codes on the questionnaire package so as to ensure confidentiality. Consent forms were stored with a code list and kept separate from the questionnaires. This is to ensure that data and names of the participants cannot be linked.

(4) Right to Fair Treatment

Participant selection should be performed in a fair, non-biased way (Grove et al., 2013) where risks and benefits have been outlined to them. Rationale for choosing participants should be linked with the study question as opposed to ease of accessibility. As a consecutive convenience sample was used in this study, eligible women were included as they presented. It is also important that participants are aware of their role in the study, what it involved, where the information would be placed and the purpose of the study as well as the potential implications of the study. This information was given to the woman and her significant other in the information leaflet. Where participants were promised an update following the study, this was provided in the form of an update on a social media platform (Grove et al., 2013).

(5) Right to Protection from Harm (Beneficence)

Beneficence is the condition that one should "attempt to do good but above all refrain from doing harm" (Grove et al., 2013 p.174). Ford and Reutter (1990) previously discussed beneficence as the benefits of the research in terms of the risks of harm to the participants (non-maleficence). Harm has been argued to be relating to constructs pertaining to physical, social, psychological, emotional, social and economic (Carr, 1994; Burns and Grove, 2005). Thus, often these principles of beneficence and non-maleficence can be challenging to predict at the hypothesis stage although in order to prevent harm, pre-emptively considering these is necessary. Within this study the nature of the concepts being addressed and the vulnerability of the sample meant that the likelihood of distress was a possibility. The researcher reviewed the literature and discussed, with experts in the field (including oncology consultants, nursing researchers), the best practice in preventing harm or distress to the woman with breast cancer and her significant other and the optimum response protocol if the woman or her significant other did become upset. Within the study, when participants felt discomfort or if they had any issues the researcher informed them to contact her or referred them back to their healthcare professional, usually their CNS, as agreed prior to the study. The researcher also gave the woman information about services available to them in the hospital (including pastoral care, CNS contact numbers and a supportive cancer care group). When the researcher was not equipped to deal with an issue, the participant was directed to the relevant personnel i.e. clinical nurse specialist or consultant. This only occurred once during the pilot phase of the study and the woman was comforted and referred to the CNS.

In calculating the benefits versus the risk of the study the researcher weighed up the potential outcome of the study and its contributions. Other studies on women with breast cancer and their identified significant others have indicated the importance of exploring this group of individuals (Kershaw et al., 2008; Salonen et al., 2014). Women with breast cancer have also identified the therapeutic nature of participating in research whilst going through treatment. Thus, although ethical issues pertaining to this study are evident, when these issues are considered and protected the study can provide an essential insight into this group of women and significant others.

Ethical approval for the study was granted from the Clinical Research Ethics Committee. Ethical approval involved a lengthy process primarily due to the vulnerability of the sample and the location of the study. These issues are further elaborated on in the next section.

Ethical Challenges

Potential for Distress

In this study the main concerning factor was the degree of distress that participation in the study may cause the woman with breast cancer and her significant other. The researcher provided her contact details and stated within the information leaflet that should the woman with breast cancer or their significant other become distressed they could contact the researcher who then directed them to the appropriate services (CNS, Consultant and/or pastoral care). The woman was also linked with a named CNS as per hospital protocol within breast cancer care.

As certain parts of the questionnaire dealt with potentially upsetting questions a protocol was discussed and put in place to ensure no harm was done to the woman. This protocol was devised following consultations with the CNS's and consultants. The researcher examined previous studies that used the HADS scale and assessed what they used as a protocol system. The researcher also asked other researchers who had experience in measuring psychological and emotional wellbeing for advice. Women with breast cancer were informed that if they scored high on the emotional and psychological wellbeing section i.e. anxiety (>11) or depressive symptoms (>11) on components of the HADS scale, then this information would be referred back to the CNS and the CNS would compare the scores of the HADS scale to the admission assessment of emotional and psychological wellbeing (Becks Depression Inventory (BDI) Beck, 1961). For significant others who scored high on the emotional and psychological wellbeing section i.e. anxiety (>11) or depressive symptom (>11), they were informed that they would be contacted and advised to consult their GP. For women with breast cancer who scored considerably high on the scale anxiety (>15) or depressive symptom (>15), they were informed that they would be referred back to their consultant, who may refer onto specialists services. Participants were informed of this in the information leaflet and consent was obtained.

Maintaining Privacy

Another challenge in relation to ethics was the maintenance of privacy and confidentiality whilst conducting a research study in a busy clinical setting. The use of a side room to inform participants about the study prevented information being overheard. The questionnaires were given to willing participants to take home to complete in an unidentifiable brown envelope pack, thus, reducing the risk that the woman's or her significant others' privacy and confidentially would be infringed on. If participants were content to complete the questionnaire in the clinics whilst they waited, a sealed box labelled "research study" and the researchers name was placed at the reception desk. Within the clinics, if women felt that they could not complete the questionnaire they were informed that they could leave it at the reception desk.

As the study was interested in the dyad, both the woman with breast cancer and her significant other were given questionnaire packs to take home. It was communicated verbally by the researcher and within the information pack that the questionnaires should be completed independently of each other however, there was no way to ensure that this was done. Thus, privacy within the dyad between the woman and her significant other may not have been assured due to the nature of the questionnaire being distributed at the clinic and posted back to the researcher.

4.11 Pilot testing

A pilot study is a micro version of the actual study conducted to identify any potential problems in the methodology design (Grove et al., 2013). The pilot test uses the same selection criteria for participants, same setting, same instruments and the same data collection and analysis techniques. The rationale for conducting a pilot study is to: (1) determine feasibility of the proposed study i.e. is it workable (2) refine instruments or measurement tools (3) identify any problems with the study prior to the formal study (4) ensure that the sampling technique is effective and the sample is representative of the population (5) examine validity and reliability of the instruments; and (6) examine data collection and analysis process for effectiveness (Appendix 17).

The pilot test was used to assess the availability of participants as well as the time required to obtain the sample. The way the woman with breast cancer and her significant other coped with the survey package was also reviewed i.e. is it understandable, easily read, efficient and timely to conduct. The study designs' ability to answer the questions in the hypotheses was also assessed as, if the design is not achieving what the researcher has set out to answer then the study will have no relevance. The settings conduciveness to the data collection process is also assessed. Following the pilot test several issues were highlighted.

4.11.1 Alterations Post Pilot Test

The pilot test for this study was conducted over a period of one month within the same acute pre-assessment clinic used for the main study. Women with breast cancer who met the inclusion criteria for the study (n=14) were identified and approached by the researcher. The women and their significant other (if present) were informed (Appendix 14) about the study and the pilot study explained. Those women who were interested (n=12) in participating were given the questionnaire pack to take home. Following return of the questionnaire packs (n=10 dyads) the below issues were highlighted:

I. Women (n=2) stated that it was too soon after their diagnosis to fully comment on how much of an impact having breast cancer has had on them. This was the only comment in the open ended question, all other participants left it blank. The researcher considered this as a potential issue however an insight into the diagnosis stage was a key factor in this study and to access woman later would have meant that they were either in treatment or had undergone surgery due to the short timeframe between diagnosis and surgery/treatment commencement (usually less than 19 days).

II. Several of the questionnaires were returned without a consent form. For the purpose of the main study the consent form were stapled to the questionnaire to prevent this. To ensure anonymity the researcher separated the consent forms from the questionnaire and stored them in a separate locked filing cabinet once received.

III. The clinic was quite noisy and overcrowded at times. Therefore, a side room located next to the clinic was requested to enable the researcher to speak with the women and their significant other in private.

The questionnaire package did not require alteration post the pilot study.

4.12 Data Collection Issues

Data Collection Time

Ethical approval took 4.5 months and required three amendments relating to questionnaire package, distribution process of pack and formatting edits. The study was initially a longitudinal design incorporating 2 time points at diagnosis and post-surgery however, due to access and data collection issues the research design was augmented. The original design consisted of the questionnaire pack being given to the woman and her significant other for completion in the clinic where a side room would be available. However, due to the busy setting of the clinic, the time constraints on the amount of time women have between clinic as well as women being brought to different departments during their clinic time (i.e. x-ray, mammography, and day clinics), the postal questionnaire format was identified as most suitable.

Dyad Component

It was difficult to ensure that both the woman with breast cancer and her significant other completed the questionnaire without having access to both individuals in the dyad. If the woman was attending the clinic by herself then the pack was given to her to take home to give to her significant other if she was agreeable to that.

Environment

The study involved using two clinics (a pre-assessment clinic and an outpatient clinic). These two clinics operated on the same day and so the researcher could only be in one at a time. The CNS and consultants were asked to distribute the questionnaire packs to eligible women in the clinic when the researcher was not present.

4.13 Data Analysis

Data management involved numbering each questionnaire package with a reference code to ensure an association could be made between the woman with breast cancer and her significant other. This involved the use of a code book (Appendix 23). Questionnaires were assessed for correctness and completeness, coding and listings of data were put into the statistical software database IBM SPSS 22.0, and analysis of responses conducted. Frequency tables and descriptive statistics were used to present and analyse data. Data analysis involved univariate, multivariate and modelling. Data for individuals were analysed initially, this was then followed by data relating to the dyad (i.e. the woman with breast cancer and her significant other).

4.13.1 Preparing Data for File Entry

Initially, a code book (Appendix 23) providing detailed instructions on how the data would be transferred from the questionnaire into a format that SPSS could interpret, was prepared and utilised throughout the data entry stage (Pallant, 2007). This involved labelling and assigning a code to each variable i.e. for categorical variables e.g. 1=male, 2= female, as well as depicting the possible responses to specific questions and their corresponding number value (Pallant, 2007).

4.13.2 Descriptive Data

Descriptive statistics is a simple way of providing a description of the sample characteristics (Maltby et al., 2007; Grove et al., 2013). As no conclusions about relationships or correlations can be made with descriptive statistics this facilitated a summarisation of the data in a way that is easily visualised. It allows for the presentation of information of the sample group such as gender, age, and relationship to woman with breast cancer etc. in a manner that is both understandable and illustrative. Descriptive data is represented using frequencies, central tendencies and dispersion and usually refers to skew ness range of scores and kurtosis (Pallant, 2007). These are discussed below.

Frequency

This refers to the number of times a value appears in the data (Parahoo, 2014). This is usually reported as a percentage (%) or in terms of sample numbers (n). Descriptive statistics for socio-demographics and each of the variables was detailed in terms of frequencies initially. Thus, giving an overall view of the data collected for each individual variable. Frequencies are represented for the woman with breast cancer (n=147), the significant other (n=127), then the women with breast cancer who were pre-treatment (n=81) and the women with breast cancer who were involved in treatment (n=66) and finally for the dyad (n=114) of the woman with breast cancer and her significant other.

Central Tendency

Central tendency relates to the average across the given sample i.e. the mean, median or mode (Parahoo, 2014). The mean and standard deviation (or where applicable the median and interquartile range) values was represented in a table format following each variable.

Dispersion

This is the range that is observed in the data i.e. the variance of scores (Pallant, 2007). This refers to the highest and lowest scores as well as the difference between them. This can be problematic due to the limitation of only taking two values thus, interquartile range (IQR) was used to give a clearer representation of the data. The standard deviation (*SD*) is most commonly used with dispersion measures. For this study, standard deviations as well as IQR’s are reported in Tables following each variable as appropriate. Normality was also assessed in terms of histograms, the data was assessed to determine if it followed a bell shaped curve or if was skewed. Skewed histograms can be to the right (negatively) or to the left (positively). The researcher also checked for outliers in the data using SPSS. This is important when considering which tests to perform in the inferential statistics (Pallant, 2007).

In terms of variables, this study consisted of both categorical and continuous variables. Categorical variables are ones which fall into categories, there is no hierarchical system attached to them i.e. age, gender (significant other only), ethnicity, religion, marital status, education level, employment, relationship of significant other, phase of treatment (woman with breast cancer only) and attachment style. The continuous variables are those which include scales thus, there is a rank applied to them i.e. relationship behaviours, relationship outcomes, affective states. The inferential data analysis will now be described.

4.12.3 Inferential Data

Inferential statistics were employed to demonstrate the associations between variables and the generalisation of study findings. The methods of inferential statistics are (1) the estimation of parameter(s) and (2) testing of statistical hypotheses. Correlation analysis was used to test the probability that variables are associated. Correlation refers to the strength of a relationship between two variables. A strong or high, correlation means that two or more variables have a strong relationship with each other while a weak correlation means that the variables are hardly related (Parahoo, 2014). Correlation coefficients can range from -1.00 to +1.00. The value of -1.00 represents a perfect negative correlation while a value of +1.00 represents a perfect positive correlation. A value of 0.00 indicates that there is no relationship between the variables (Grove et al., 2013).

It is worthy to note that correlation does not infer a cause i.e. a correlation between two variables does not necessitate that one causes an effect in another, it merely implies that a relationship or an association can be derived from the results (Maltby et al., 2007). Furthermore, correlation research tends to be restricted in terms of effect size. As sample size can have an impact on results, researchers need to be considerate towards the results of their studies in terms of statistical significance, thus the larger the sample size the lower that the parameters for correlations tend to be (Maltby et al., 2007). Greater sample sizes offer stronger correlations i.e. a correlation of 0.2 in a sample of 50 may not be significant although a correlation of 0.2 in a sample of 1,000 participants is considered statistically significant. In order to determine if correlations existed between variables, univariate analysis, multivariate analysis and interdependence dyad mixed modelling (multi-level modelling) was performed on the data.

Univariate Analysis

Univariate analysis involved the comparison of each of the independent variables with quality of life (QOL) as the dependent variable. The choice of statistical test is dependent on several factors, including sample size, sampling method, and level of measurement and distribution of data i.e. normal distribution (bell shaped curve) or skewed (Parahoo, 2014). As this study is concerned with numerous variables, analysis involved several steps (Figure 4.3).

Initially, a simple linear regression was performed. Simple linear regression attempts to determine the degree to which 2 variables are correlated, based on a straight line. In simple linear regressions there is one independent variable and one dependent variable. Performing a simple linear regression with a binary (categorical) independent variable is equivalent to performing a t-test. Performing a simple linear regression with a categorical independent variable (that has more than 2 categories) is equivalent to performing a one way analysis of variance (ANOVA). Performing a simple linear regression with a continuous independent variable is equivalent to calculating Pearson's correlation coefficient. Thus, the simple linear regression consisted of t test (categorical variables), ANOVA (categorical variables with more than 2 categories) and interpretation of Pearson correlation coefficient (continuous variable).

A t test is a parametric test used to compare, when the data is normally distributed i.e. bell shaped curve observed. As each of the variables consisted of different groups, t test were used to compare mean scores between group categories. T test determine how much of a difference is incurred between variables and the degree of this difference through the generation of a *p* value. ANOVA is used when there are two or more groups. For the categorical variables (more than 2 categories) one way analysis of variance (ANOVA) was used. ANOVA is a statistical method used to test differences between two or more means and involves one independent variable which has a number of different levels (Parahoo, 2014). These levels represent different groups or conditions. The dependent variable has to be continuous in nature (as is the case with QOL). T tests were used to determine if a correlation exists between each of the independent variables and the dependent variable (QOL).

This p value depicts the likelihood of generating the results by chance, if the null hypothesis is true. The *p*-value for each term tests the null hypothesis that the coefficient is equal to zero (no effect). The null hypothesis is that there is no association between the independent variable(s) and the dependent variable. If the regression coefficient is not significantly different from 0 (i.e. 95% Confidence Interval (CI) includes 0/p-value >0.05), then we fail to reject the null hypothesis of no association. Thus, *p* values are used to determine if the regression coefficient is significantly different from 0. A low p-value

(< 0.05) indicates that the null hypothesis ca be rejected. In other words, an independent variable that has a low p-value indicates an association with the dependent variable. Conversely, a larger (insignificant) p-value suggests that changes in the independent variable are not associated with changes in the dependent variable.

The generation of a scatterplot is used to interpret results; (1) outliers are checked i.e. points far from normal distribution of dots, these indicate higher or lower scores than the expected norm values, (2) distribution of data i.e. are the points evenly spread, can a straight line be drawn through the data i.e. is there a linear relationship; is the cluster even from end to end, (3) determine the direction of the relationship; an upward trend in the line through the scatterplot indicates a positive relationship, (4) the strength of the relationship. Cohen (1988) suggest that *r* values which represent Pearson correlation that fall between 0.10 to 0.29 (or -0.10 to -0.29) indicates a small effect, 0.30 to 0.49 (or -0.30 to -0.49) is a medium effect, 0.5 to 1.0 (or -0.50 to -1.0) indicates a large effect, (5) calculate coefficient of determination (multiply r value by itself) to determine how much variance the two variables share, (6) assess significance level, i.e. the value of *p*. Traditionally a level of $p<0.05$ is considered to be essential for statistical significance, however Parahoo (2014) recommends caution, as sample size can influence this and suggests that often level of variance is more important than significance, as some variables may not reach a level of significance but still have practical relevance.

Multivariate Analysis

Multivariate analysis (MVA) involved a multi linear regression. This is used when more than one independent variable is being investigated with the dependent variable (QOL) and comparison between several dependent variables is sought (Pallant, 2007; Hair et al., 2010). Thus, multivariate analysis can include multiple independent variables. While multivariate and multivariable are often used interchangeably, it is worthy to note that the two are different. This step in the analysis was a multivariable approach as it used one dependant variable (i.e. quality of life), however to be consistent with existing research works the term multivariate is used. As this study was interested in determining which variables are most associated with QOL all variables which were significant to a level of $p<0.25$ in the univariate analysis were incorporated into a multivariate analysis, to determine which were most correlated with QOL. This level was chosen to ensure any relevant variables which may be significant but not to a level of 0.05 were included. Multivariate analysis was conducted to determine if a correlation existed between quality of life and each of the other statistically significant independent variables when all variables were included in the analysis.

Multiple regression allows comparison to be altered to determine the variables which best predict the dependent variable (i.e. QOL) (Hair et al., 2010). Regression analysis helps to understand how the typical value of the dependent variable (or 'criterion variable') changes when any one of the independent variables is varied, while the other independent variables are held fixed (Armstrong, 2012). Multi linear regression analysis is widely used for prediction and generalisation of results (Hosmer and Lemeshaw, 2005). Multi linear regression analysis is also used to determine which independent variables are most significantly related to the dependent variable, and to explore the nature of these relationships i.e. their strength and direction (Armstrong, 2012). Thus, several variables (independent) can be put into the model and analysed to see which have an association with QOL (dependent).

Interdependence Modelling (Multi Level Modelling)

The Actor-Partner Interdependence Model (APIM) (Kenny, 1988; Kenny, 1990; Kenny; 1996; Kenny And Cook, 1999) was used in this study for analysis of the dyadic data. The actor–partner interdependence model (APIM) is a model that conceptually views interdependence in dyadic relationships and utilises the appropriate statistical techniques for measuring and testing dyadic effects (Kenny and Cook, 2005). Interdependence implies that two individuals are linked such that knowledge of one person's score provides information about the other person's score. This type of modelling facilitates the comparison of two or more independent variables on a dependant variable whilst considering the dyadic relationship among variables (Hosmer and Lemeshaw, 2005; Kenny et al., 2006). The APIM is increasingly being used in research including studies of emotion (Butler et al., 2003), health (Butterfield, 2001), communication competence (Lakey and Canary, 2002), personality (Robins et al., 2000), and attachment style (Campbell et al., 2001). The model has clear implications for use in the study of families (Rayens and Svavardottir, 2003) and close relationships (Campbell and Kashy, 2002).

Multilevel models can handle missing data and therefore maximize the utility of existing data (Kenny et al., 2006). Data from dyad members (n=114 dyads) is treated as nested scores within the same group (i.e., coupled together) this is in line with other research conducted with dyads where scores from both participants within the dyad are gathered individually but treated as one unit (Kenny et al., 2006). The APIM can estimate the extent to which the independent variable of a person influences his or her score on the dependent variable. This is known as the actor effect- denoted as a. The APIM can also estimate the extent to which the independent variable of a person influences the dependent variable of his or her partner. This is known as the partner effect — denoted as p. Modelling involves testing main effects among variables, mixed effects and interactions between variables inputted into the model.

Qualitative Data Analysis

Qualitative content analysis is one method used to analyse textual data, focusing on reducing it into manageable segments through the application of codes, and reorganizing data to allow for the drawing and verification of conclusions (Miles and Huberman, 1994). The product of this process is an interpretation of the meaning of the data in a particular context. Qualitative content analysis can be used by itself or in combination with other empirical methods, to examine textual data derived from several sources, as a versatile strategy to explore phenomena (Moran, 1993; Patton, 2002; Forman and Damschroder, 2008).

Descriptive qualitative content data analysis was used to analyse the open comments section of the questionnaire. Content analysis is a systematic, rule-guided set of techniques used to analyse textual data (Mayring, 2000). Content analysis can be quantitative or qualitative, however both involve systematically categorizing textual data in order to make sense of it (Miles and Huberman, 1994). Qualitative content analysis provides a comprehensive description of a phenomenon (e.g., decision-making, delivery of healthcare services); apprehending the views and experiences of participants. Qualitative content analysis examines data generated from open-ended collection methods aimed at gaining detail and depth about a phenomena.

Content analysis involves developing and applying codes to the data. Coffey and Atkinson regard, attaching codes to data and the development of concepts as important functions in ensuring a rigorous review of the data (Coffey and Atkinson, 1996, p. 27). Codes can be either deductive or inductive. Deductive codes are constructed from theoretical frameworks, empirical work, and research questions. Inductive codes come from the data itself. Although there are studies that use codes developed deductively or inductively, content analysis most often has a combination of both approaches. Once codes are applied (preliminary coding), these can be grouped together to form themes, subcategories and finally categories.

This study consisted of the researcher using inductive coding to identify emergent issues within the open comments of the study. While the limited amount of textual data obtained in the open section of the questionnaire restricts the drawing of conclusions, the process of data analysis for this section will be presented and the key issues illustrated. The researcher reviewed the data and developed themes through the emergence of common phrases, words and views (Forman and Damschroder, 2008). This consisted of reading through the extracted text, highlighting codes, grouping the codes into subcategories and then categories. Figure 4.3 depicts the data analysis techniques employed in the study.

Figure 4.3 Description of Data Analysis for Study

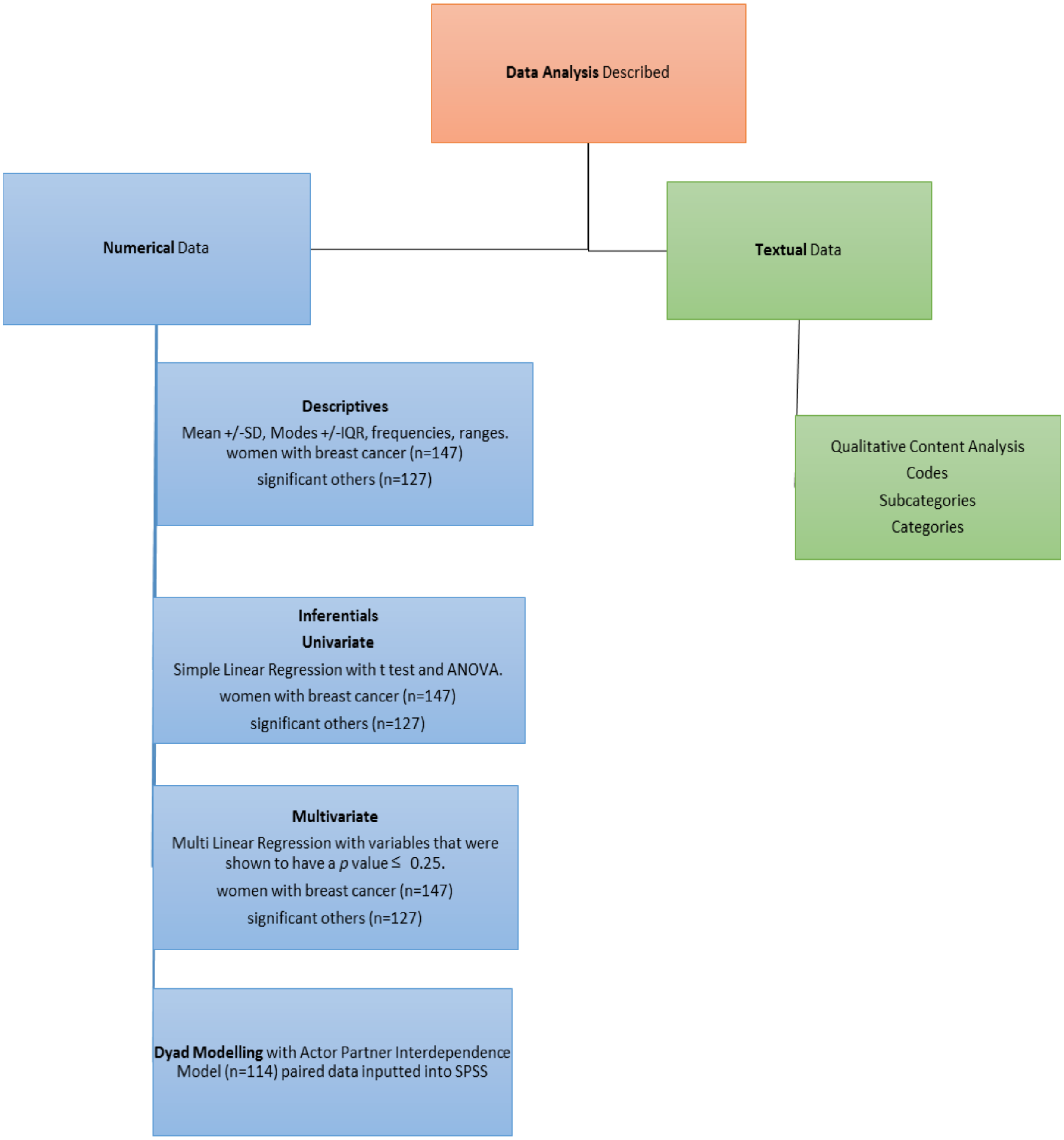


Figure 4.3 shows the data analysis techniques used in this study for the various types of data.

Summary

The purpose of this chapter was to describe the research methodology for a study exploring the influence of attachment style on health and disease outcomes for women with breast cancer and their identified significant other. This chapter provided an outline of the methodology for a descriptive correlational study examining the influence of attachment style, dyadic processes (relationship behaviours, relationship outcomes) and affective states on the health outcomes of women with breast cancer and their identified significant other. Potential problem areas for the study pertaining to access, ethics and analysis were described with ways of limiting these issues addressed. The recruitment of a sample from an acute hospital in the South of Ireland was detailed. Instrumentation, data collection and data analysis have been detailed. The following chapter will present findings from the study depicting correlations and the main study outcomes.

Chapter V Findings

Introduction

The findings of the study are presented in the following chapter. The results are presented using descriptive statistics initially, to describe the characteristics of the sample (socio-demographics) and the variables being measured. Following the descriptive statistics, the association between variables are presented. This is done under the headings of univariate, multivariate and dyadic interdependence modelling. The findings focusing on the woman with breast cancer and her significant other individually are presented first. This is then followed by findings relating to the dyad i.e. the woman with breast cancer and her significant other as a pair.

The key variables are presented under the headings of: (I) Relationship Orientation (II) Relationship Behaviours (III) Relationship Outcome (IV) Affective States and (V) Health Outcome. These headings are used as they are related to the framework (Figure 4.1) used for the study.

5.1 Response Rate

Two hundred and fifty women were identified by the Clinical Nurse Specialist as being diagnosed with primary breast cancer through the pre-assessment and outpatient clinics. These women were approached by the researcher at the clinic and invited to take information leaflets and questionnaire packs home. Ultimately, 147 women with breast cancer (a response rate of 58.8%) and 127 significant others (50.8%) returned completed questionnaires. In terms of responses from full dyads (i.e. the woman with breast cancer and her significant other), 114 dyadic responses (45.6%) were recorded. This response rate is reflective of similar studies on dyads (Steinhauser et al., 2006; Quinn et al., 2009) and perhaps demonstrates the intense nature and problems of this type of research.

Of the 147 women with breast cancer who completed questionnaires, two categories emerged. These were, women with breast cancer who were in the pre-treatment stage (n=81) and women with breast cancer who were presently involved in treatment (n=66). Data on reasons for non-completion of the questionnaire was not collected as this was not feasible. In the following section, descriptive findings starting with the socio-demographics and then the variables in the study are presented.

5.2 Descriptive Statistics

As mentioned in the previous section the sample for this study was women with breast cancer (n=147) and significant others (n=127), who completed questionnaires. Participants' gender (for significant other only), age, ethnicity, religion, marital status, level of education, employment status, relationship to each other and phase of treatment (woman with breast cancer only) were obtained from the questionnaire. Initially, this section describes the data using descriptive statistics. Findings are reported on both groups individually, first for women with breast cancer (n=147) and the significant others (n=127). This was done so as to ensure as much data as possible was reported on at an individual and dyad level.

5.2.1 Data Entry

The data were entered into the computer programme IBM SPSS manually by the researcher. Then the data were checked twice against the original questionnaire manually using the code book (Appendix 23) to ensure no errors had occurred during data entry. Scoring of the items used in the questionnaire was conducted prior to entry into SPSS software.

5.2.2 Socio-demographics

This section details the descriptive statistics pertinent to the socio-demographics of the sample. Full details of the socio demographics of the sample in the study are presented within Table 5.1.

Gender

Accordingly, the numbers of significant others was calculated to be 82.7% (n=105) male and 17.3% (n=22) female of the sample (n=127) (Table 5.1). Thus, more male significant others than females partook in this study.

Age

Most women with breast cancer (33.3%, n=49) were in the 55 to 64 years age category (Table 5.1). This was followed closely by those in the 45-54 year age category (32.7%, n=48). This is in line with current statistics on breast cancer in Ireland (WHO, 2013: NCRI, 2016) the median age profile for women with breast cancer is 59 years of age. For significant others, most (33.1%, n=42) were categorised as 55 to 64 years also.

Ethnicity

Almost all women with breast cancer were Irish (87.8%, n= 129) followed by any other white background (10.9%, n= 16), only one person was categorised as being from any other black background (<1%). Significant others were mainly Irish (87.4%, n=111) or from any other white background (10.2%, n=13) (Table 5.1).

Religious Status

The majority of women with breast cancer indicated Roman Catholic as their religion (70.7 %, n= 104). This was followed by other (not specified) (23.8%, n=35) and Church of Ireland (4.1%, n=6). The religious status of the significant others showed similar trends with Roman Catholic (72.4%, n=92) followed by other (23.6%, n=30) (Table 5.1).

Marital Status

In terms of marital status most women with breast cancer were married (66%, n=97) or living with a partner (16.3%, n= 24). Significant others (n=127) were mainly married (78.2%, n=100) or living with their partner (9.4%, n=12), smaller percentages made up single (4.7%), separated (3.9%) and other (3.1%) (Table 5.1).

Highest Educational Level

Most women with breast cancer who participated had received some form of a secondary level education (46.9%, n= 69), 36.7% (n=54) had primary level education and over 8% (n= 12) had received a third level education. No formal education was observed for 6.8% (n=10) of women with breast cancer. For significant others most were secondary level educated (58.3%, n=74), followed by primary level education (30.7%, n=39), those with no formal education (7.1%, n=9) and third level education (3.9%, n=5) (Table 5.1).

Employment Status

Over half of women with breast cancer had a paid job (55.5%, n= 82), while 31% (n=21.1) indicated looking after the family home as their employment status. Retired from employment (14.3%, n=21) or unable to work (5.4%, n= 8) were also categories that women with breast cancer selected. Most significant others were categorised as engaging in working for payment (82.7%, n=105), followed by retirement (11.8%, n=15) (Table 5.1).

Relationship to Woman

Spouses were indicted as the most common relationship to the woman (78.9%, n=116), followed by sister/brother (8.2%, n=12), parent (5.4%, n=8), daughter/son (4.8%, n=7). This is demonstrative and consistent with other studies on dyads (Quinn et al., 2009) indicating most significant others as spouses. For significant others spouses were also indicated as the most common relationship to the woman with breast cancer (81.9%, n=104), followed by brother/sister (9.4%, n=12) and daughter/son (7.1%, n=9) (Table

5.1). Disparities between figures is due to the fact that more women with breast cancer returned completed questionnaires than significant others.

Phase of Treatment/Trajectory

Of the 147 women with breast cancer who competed the questionnaire and returned it, just over half were in the pre-treatment phase (n=81, 55.1%). The pre-treatment group of women with breast cancer were post diagnosis and about to undergo treatment or surgery. The remaining women were in the in treatment phase (n=66, 44.9%). Women in the in treatment group were those who were attending an outpatient clinic and had undergone chemotherapy, radiotherapy and/or surgery or were currently undergoing treatment for primary breast cancer.

Following on from the socio demographics, each construct studied is described. Findings for each of the constructs are presented in detail. This is done under the headings of (I) Relationship Orientation, (II) Relationship Behaviour, (III) Relationship Outcome, (V) Affective States and (VI) Health Outcome. This presentation method was chosen as it follows the theoretical framework underpinning the study (Figure 4.1) (Pietromonaco et al., 2013) based on Attachment Theory developed by (Bowlby, 1969).

Table 5.1 Demographic Characteristics of the Sample in the Study

Demographic variable	**Women with Breast Cancer**	**Significant Other**	**Dyad**
	n= 147 (%)	**n=127 (%)**	**n=228 (%)**
Gender			
Male	0(0)	105(82.7)	95(41.7)
Female	147(100)	22(17.3)	113(58.3)
Age in Years			
25-34	6(4.1)	5(3.9)	8(3.5)
35-44	23(15.6)	27(21.3)	45(19.7)
45-54	48(32.7)	34(26.8)	64(28.1)
55-64	49(33.3)	42(33.1)	76(33.3)
65+	21(14.3)	19(15.0)	35(15.4)
Ethnicity			
Irish	129(87.8)	111(87.4)	198(86.8)
Any other white background	16(10.9)	13(10.2)	25 (11.0)
Irish Traveller	1(0.7)	1(0.8)	2(0.9)
Any other black background	1(0.7)	1(0.8)	2(0.9)
Chinese	0(0)	1(0.8)	1(0.4)
Religion			
Roman Catholic	104(70.7)	92(72.4)	164(71.9)
Other	35(23.8)	30(23.6)	55(24.1)
Church of Ireland	6(4.1)	4(3.1)	7(3.1)
Presbyterian	1(0.7)	1(0.8)	1(0.4)
Islam	1(0.7)	0(0)	1(0.4)
Marital Status			
Married (living with spouse)	97(66)	100(78.7)	168(73.7)
Living with partner	24(16.3)	12(9.4)	29(12.7)
Single (never married)	9(6.1)	6(4.7)	13(5.7)
Widowed	8(5.4)	4(3.1)	7(3.1)
Separated	4(2.7)	5(3.9)	2(0.9)
Divorced	3(2.0)	0(0)	5(2.2)
Other	2(1.4)	0(0)	4(1.8)
Highest Level of Education			
No Formal Education	10(6.8)	9(7.1)	16(7.0)
Primary Level	54(36.7)	39(30.7)	73(32.0)
Secondary Level	69(46.9)	74(58.3)	125(54.8)
Third Level	12(8.2)	5(3.9)	12(5.3)
Other	2(1.4)	0(0)	2(0.8)
Current Employment Status			
Working for payment	82(55.8)	105(82.7)	157(68.9)
Looking for job	1(0.7)	1(0.8)	1(0.4)
Unemployed	2(1.4)	2(1.6)	4(1.8)
Student	1(0.7)	0(0)	1(0.4)
Looking after family/home	31(21.1)	1(0.8)	27(11.8)
Retired	21(14.3)	15(11.8)	30(13.2)
Unable to work due to illness	8(5.4)	1(0.8)	7(3.1)
Other	1(0.7)	2(1.6)	1(0.4)
Relationship of Significant Other			
Spouse/partner	116(78.9)	104(81.9)	187(82.0)
Brother/sister	12(8.2)	12(9.4)	9(3.9)
Parent	8(5.4)	0(0)	20(8.8)
Daughter/son	7(4.8)	9(7.1)	10(4.4)
Other	3(2.1)	1(0.8)	2(0.9)
Step/foster child	1(0.7)	0(0)	0(0)
Daughter/son in law	0(0)	1(0.8)	0(0)

Table 5.1 n=number of participants, % = percentage of participants. No missing data was present for the above socio-demographic variables.

5.2.3 Relationship Orientation (i.e. Attachment Style)

Objective 1: Measure the Relationship Orientation (i.e. Attachment Style) of women with breast cancer and their significant other.

Following on from the socio-demographics, the first question of section two of the questionnaire focused on relationship orientation i.e. attachment style. To determine the self-reported attachment style of the individuals in the study, participants completed the Relationship Questionnaire (RQ) (Bartholomew and Horowitz, 1991). This questionnaire has two parts. Firstly, women with breast cancer and their significant other were asked to indicate which style out of a possible 4 options was most applicable to them. The four options relate to style A=secure, style B=fearful, style C=preoccupied and style D= dismissive. The most common indicated attachment style for women with breast cancer was secure (58.5%) regardless of whether in the pre-treatment or in the in treatment group (Table 5.2). For significant others the most common attachment style indicated was also identified as secure (59.8%) (Table 5.2).

Table 5.2 Attachment Style of Sample in Study Categorised by Group

Variable	**Woman with Breast Cancer (Total) (n=147)**	**Significant Others (Total) (n=127)**
Attachment Style	n (%)	n (%)
Style A	86 (58.5)	76 (59.8)
Style B	13 (8.8)	5 (3.9)
Style C	6 (4.1)	4 (3.1
Style D	42 (28.6)	42 (33.1)
Variable	**Women with Breast Cancer Pre Treatment (n=81)**	**Women with Breast Cancer In Treatment (n=66)**
Attachment Style	n (%)	n (%)
Style A	50 (61.7)	36 (54.5)
Style B	7 (8.6)	6 (9.1)
Style C	3 (3.7)	3 (4.5)
Style D	21 (25.9)	21 (31.8)
Variable	**Woman with Breast Cancer in Dyad (n=114)**	**Significant Others in Dyad (n=114)**
Attachment Style	n (%)	n (%)
Style A	68 (59.6)	67 (58.8)
Style B	7 (6.1)	5 (4.4)
Style C	4 (3.5)	3 (2.6)
Style D	35 (30.7)	39 (34.2)

Table 5.2 shows data on the self-categorisation of attachment style for women with breast cancer (n=147) and significant others (n=127). Style A indicates secure attachment style, Style B indicates fearful attachment style, Style C indicates preoccupied attachment style and Style D indicates dismissive attachment style. Attachment style is further segmented for women who are pre-treatment (n=81) and in treatment (n=66).

The next section in the Relationship Questionnaire assessed the persons' Model of Self and their Model of Other. This part of the questionnaire using a 7-point Likert scale ranging from (1) "do not agree at all" to (7) "agree completely" consisted of 4 items. Participants were asked to rate their level of agreement with each statement. The statements each relate to one of the four attachment styles i.e. secure, fearful, preoccupied, dismissive. These ratings (or "scores") provide a profile of an individual's attachment feelings and behaviour. For each participant a score is calculated based on their responses to the items that make up the scale to gain a total score for: (1) Model of Self and (2) Model of Other (Figure 5.1 and 5.2). Higher scores on the Model of Self indicate higher levels of anxiety and more negative Models of Self in terms of relationship orientation (i.e. attachment style). Higher scores on the Model of Other indicate higher levels of avoidance in terms of relationship orientation (i.e. attachment style) and a more negative Model of Others.

Model of Self was used to determine how anxious the person is in terms of relationships. Model of Other scores are used to determine how avoidant the person is in terms of relationships. The secure style of attachment is characterized by low anxiety and low avoidance; the preoccupied style of attachment is characterized by high anxiety and low avoidance; the dismissive avoidant style of attachment is characterized by low anxiety and high avoidance; and the fearful avoidant style of attachment is characterized by high anxiety and high avoidance (Bartholomew and Horowitz's, 1991).

Figure 5.1 Calculations used for Model of Self scores and Model of Other scores

Model of Self : (Secure **PLUS** Dismissing) **MINUS** (Fearful **PLUS** Preoccupied)

i.e. (**STYLE A + STYLE D**) – (**STYLE B + STYLE C**)

Model of Other : (Secure **PLUS** Preoccupied) **MINUS** (Fearful **PLUS** Dismissing)

i.e. (**STYLE A + STYLE C**) – (**STYLE B + STYLE D**)

Figure 5.1 shows the calculations performed on the scores indicated by women with breast cancer (n=147) and significant others (n=127) on the Relationship Questionnaire (RQ) in order to gain a total score for Model of Self and Model of Other.

Figure 5.2 Diagrammatic Representations of Model of Self and Model of Other for Interpretation

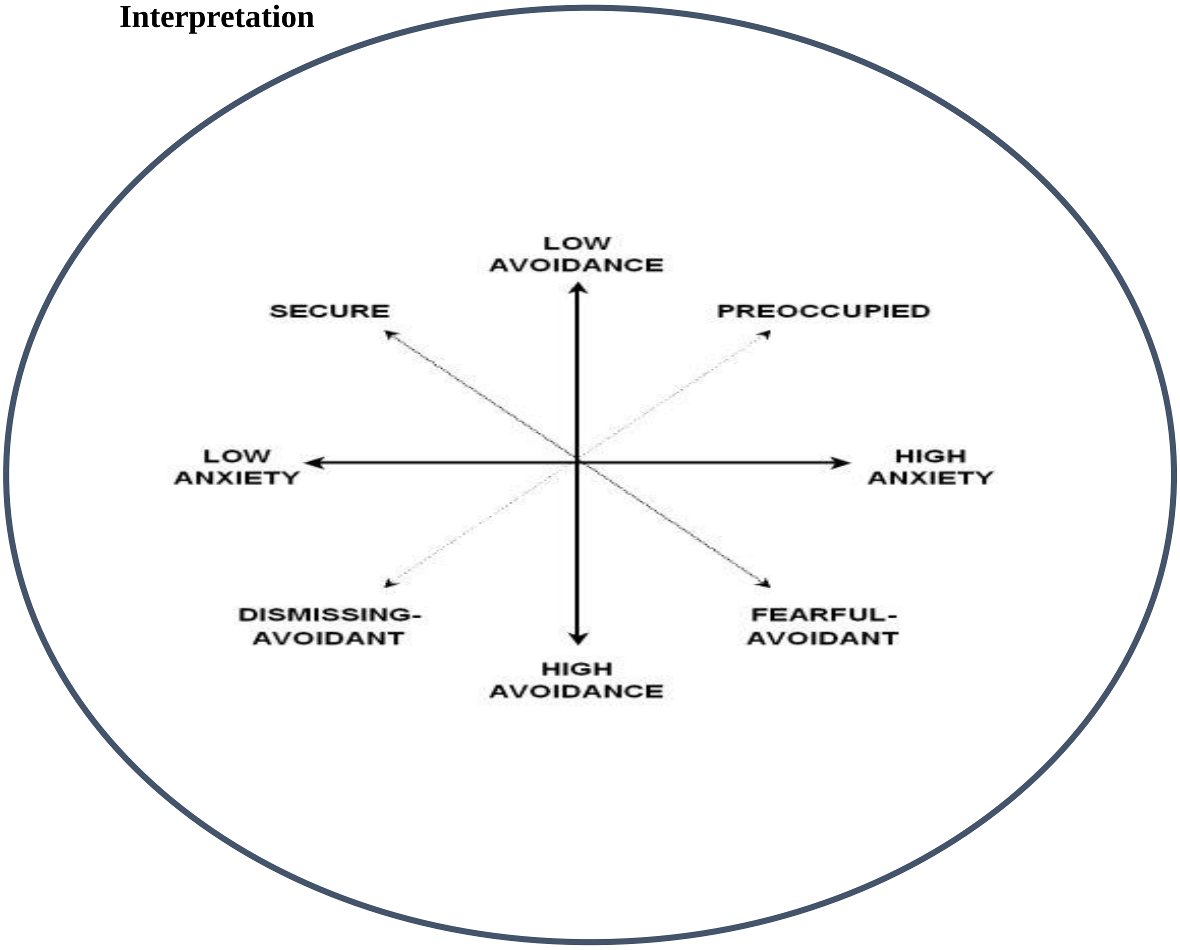


Figure 5.2 shows the interpretation of Model of Self/Model of Other scores. From the arrows it is denoted that: Secure attachment style is indicated by low anxiety and low avoidance. Preoccupied attachment style is indicated by high anxiety and low avoidance. Fearful attachment style is indicated by high anxiety and high avoidance. Dismissive attachment style is indicated by low anxiety and high avoidance.

Table 5.3 Attachment Style for Women with Breast Cancer and their Significant Other as indicated by Model of Self and Model of Other Scores.

		Women with Breast Cancer (Total) (n=147)			Significant Other (Total) (n=127)		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Model of Self	-12 to 12	- 6 to 6	1.3(3.02)	2(-1 to 4)	-5 to 8	0.8(3.14)	1(-2 to 3)
Model of Other	-12 to 12	- 6 to 8	1.3(3.01)	2(-1 to 4)	-8 to 6	1.0(2.77)	1(-1 to 3)
		Women with Breast Cancer Pre Treatment (n=81)			**Women with Breast Cancer In Treatment (n=66)**		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Model of Self	-12 to 12	-5 to 6	1.7(3.02)	2(-3 to 5)	-6 to 6	0.8(2.98)	1.5(-3 to 2)
Model of Other	-12 to 12	-6 to 6	1.7 (3.11)	2(-2 to 5)	-6 to 8	0.7(2.81)	1(-3 to 4)
		Women with Breast Cancer Dyad (n=114)			**Significant Other Dyad (n=114)**		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Model of Self	-12 to 12	-6 to 6	1.2(3.08)	2(-1 to 3)	- 5 to 8	0.8(3.21)	1 (-2 to 4)
Model of Other	-12 to 12	-6 to 7	1.0(2.87)	2(-1 to 3)	-8 to 6	1(2.84)	1(-1 to 3)

Table 5.3 shows data on the Model of Self scores and Model of Others scores for women with breast cancer (n=147) and significant others (n=127). Scale range -12 to 12. Higher scores on Model of Self indicate higher level of anxiety and poorer model of self. Higher scores on Model of Other indicate higher levels of avoidance and poorer models of others.

In terms of Model of Self /Anxious attachment style scores for women with breast cancer were low (Table 5.3). In terms of the phase of treatment, women with breast cancer who were in the in treatment group (n=66) had lower scores when compared with women in the pre-treatment group indicating higher levels of avoidance and anxiety. For significant others scores were also low, indicating low levels of attachment avoidance and anxiety (Table 5.3).

5.2.4 Relationship Behaviour (i.e. Support Seeking and Receipt Behaviours)

Objective 2: Describe the dyadic processes i.e. relationship behaviours (i.e. support seeking/support receipt) for women with breast cancer and their significant other within the cancer trajectory.

Support was assessed with the following subscales of the Berlin Social Support Scale (BSSS) (Schulz and Schwarzer, 2003b): Need for Support (4 items), Support Seeking (5 items) and Actual Received Support / Actual Provided Support (19 items). An overall score for each participant was calculated by summing the three subscales (after re-coding), range of scores 0 to 92. In terms of comparing women in the pre-treatment and the in treatment group, women in the pre-treatment group scores were higher than those in the in treatment group. One outlier was evident in the in treatment group who scored lower (score of 59 on overall scale), although this score still indicated good overall support (ID 256). Overall scores for the scales assessing support were high, thus indicating good overall support behaviours (Table 5.4). Each of the subscales will now be presented in detail.

Table 5.4 Supportive Behaviours for Sample as Indicated on the Berlin Social Support Subscales

		Women with Breast Cancer (Total) (n=147)			Significant Other (Total) (n=127)		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Need for Support	4 to 16	6 to 16	11.5 (1.57)	11 (11 to 13)	7 to 16	11.8(1.60)	12(11 to 13)
Actual Received Support	14 to 56	38 to 56	48.6 (3.89)	48 (45 to 51)	44 to 56	49.2(3.34)	49(46 to 49)
Support Seeking	5 to 20	5 to 20	15.5 (2.23)	15 (15 to 17)	11 to 20	15.6(1.92)	15(15 to 17)
Overall Support	23 to 92	59 to 90	75.6 (5.78)	76 (71 to 80)	67 to 92	76.7(4.85)	77(73 to 80)

		Women with Breast Cancer Pre Treatment (n=81)			Women with Breast Cancer In Treatment (n=66)		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Need for Support	4 to 16	7 to 16	11.7(1.64)	11(10 to 13)	6 to 14	11.4(1.47)	12 (9 to 13)
Actual Received Support	14 to 56	38 to 56	49.6(4.27)	50(45 to 55.8)	41 to 56	47.3(2.97)	46.5(45 to 51)
Support Seeking	5 to 20	8 to 20	16.0(2.34)	15(14 to 20)	5 to 19	15.0(1.99)	15 (13 to 17)
Overall Support	23 to 92	64 to 90	77.2(6.25)	77(70 to 86.8)	59 to 83	73.7(4.45)	73(68 to 79.3)

		Women with Breast Cancer in Dyad (n=114)			Significant Other in Dyad (n=114)		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Need for Support	4 to 16	8 to 15	11.5(1.33)	11(11 to 13)	7 to 16	11.8(1.62)	12(11 to 13)
Actual Received Support	14 to 56	38 to 56	48.1(3.76)	47(45 to 51)	44 to 56	49.2(3.25)	49(46 to 52)
Support Seeking	5 to 20	10 to 20	15.6(1.84)	15(15 to 17)	11 to 20	15.7(1.85)	15(15 to 17)
Overall Support	23 to 92	64 to 81	75.2(5.08)	74(71 to 79)	67 to 92	76.8(4.84)	77(73 to 80)

Table 5.4 shows data for support seeking behaviours in terms of 3 subscales (need for support, actual support and support seeking) on the Berlin Social Support Scale for women with breast cancer (n=147) and significant others (n=127). Scores are also categorised in terms of women who are pre-treatment or those who are in treatment. Higher scores on subscales indicates higher support behaviours.

Need for Support

For women with breast cancer (n=147) scores on the Need for Support indicated a moderate to high need for support. However, for significant others (n=127) need for support was rated as higher. Women with breast cancer in the pre-treatment group indicated a slightly higher need for support on the scale than woman in the in treatment group, although there was not a vast difference between the two groups (Table 5.4).

Support Seeking

The support seeking subscale indicated low to high support seeking behaviour for women with breast cancer and their significant others. Women with breast cancer in the pre-treatment had slightly higher scores on the support seeking subscale than women in the in treatment group, but not to a notable level (Table 5.4).

Actual Received Support

Subscale scores for Actual Received/Provided Support for women with breast cancer indicated high levels of actual support being reported as received (*M*=48.6, *SD*=3.90). For significant others actual provided support was also high (*M*=49.2, *SD*=3.34) (Table 5.4). Women with breast cancer in the pre-treatment group scored higher on actual received support than women in the in treatment group on actual received support, although this was not a substantial difference.

5.2.5 Relationship Outcome (i.e. Relationship Satisfaction)

Objective 2: Describe the dyadic processes i.e. relationship outcomes (i.e. relationship satisfaction) for women with breast cancer and their significant other within the cancer trajectory.

In this section of the questionnaire women with breast cancer and their significant other were asked about their level of satisfaction with their relationship with their nominated significant other. A short four-item satisfaction subscale of the Investment Model (Rusbult et al., 1998) was used to assess relationship satisfaction. The majority of women with breast cancer and significant others indicated that they were satisfied with their relationship. Women with breast cancer indicated slightly lower levels of satisfaction with their relationship compared to significant others (Table 5.5). A skewness to the left (negative) was observed on the histogram for women with breast cancer, indicating that the mean is less than the median, median (IQR) 28 (26 to 30), thus a larger proportion of scores were to the right hand side. This is acceptable as higher scores are more favourable as they indicate higher degrees of satisfaction with the relationship.

Table 5.5 Relationship Satisfaction for Sample as Indicated on the Satisfaction Subscale of the Investment Model

		Women with Breast Cancer (Total) (n=147)			**Significant Other (Total) (n=127)**		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Relationship Satisfaction	0 to 32	16 to 32	27.7(3.34)	28 (26 to 30)	20 to 32	28.4(2.30)	28 (27 to 30)
		Women with Breast Cancer Pre Treatment (n=81)			**Women with Breast Cancer In Treatment (n=66)**		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Relationship Satisfaction	0 to 32	16 to 32	27.5(3.81)	28(21 to 32)	21 to 32	28.0 (2.65)	28(24 to 32)
		Women with Breast Cancer in Dyad (n=114)			**Significant Other in Dyad (n=114)**		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Relationship Satisfaction	0 to 32	19 to 32	27.7(3.01)	28 (26 to 30)	20 to 32	28.5(2.31)	29(27 to 30)

Table 5.5 shows data on the Relationship Satisfaction subscale of the Investment Model for women with breast cancer (n=147) and significant others (n=127). Possible range 0-32, higher scores indicates higher satisfaction with relationship.

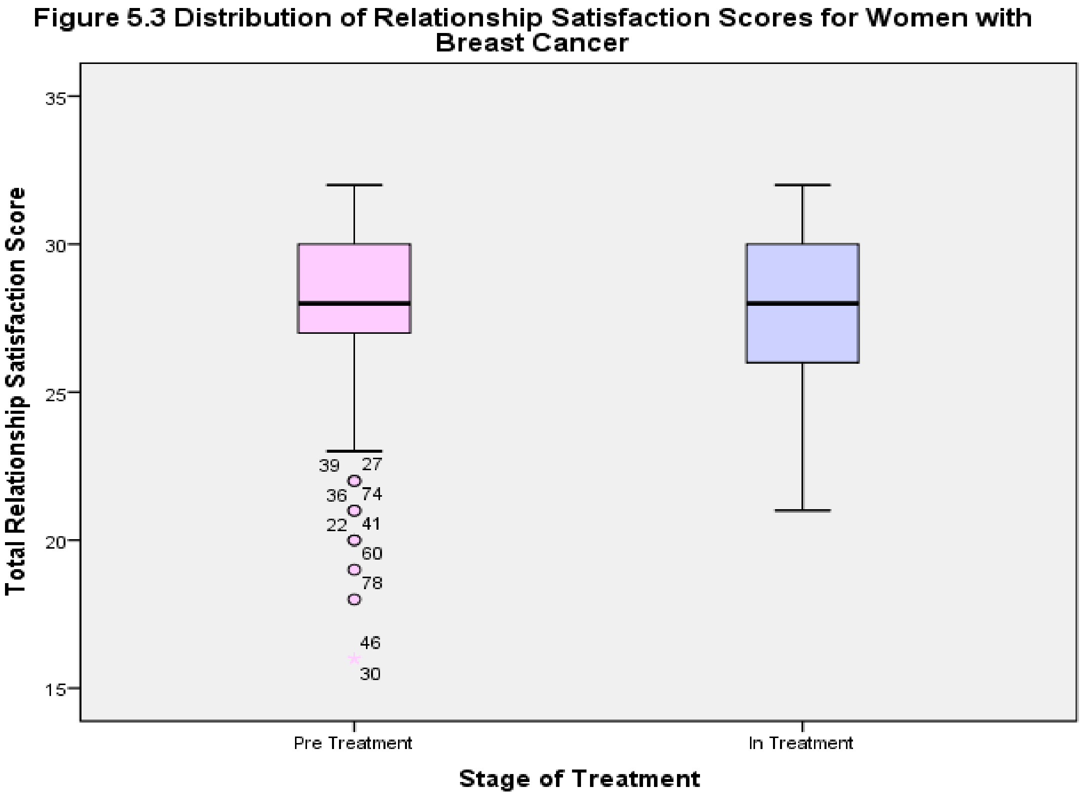


Figure 5.3 shows the scores for Relationship Satisfaction subscale of the Investment Model for women with breast cancer (n=147) as categorised by stage of treatment. Possible range 0-32*, higher scores on the Relationship Satisfaction subscale indicates higher satisfaction with relationship. Pre=women with breast cancer in pre-treatment stage (n=81). Post=women with breast cancer in treatment stage (n=66).

5.2.6 Affective States (i.e. Anxiety and Depressive Symptoms)

Objective 3: Measure the health processes i.e. affective states (i.e. anxiety and depressive symptoms) for women with breast cancer and their significant other.

Hospital Anxiety and Depression Scale_ Anxiety (HADS_A)

Participants rated their level of agreement or how applicable each statement was from 0-3. For women with breast cancer, anxiety scores on the HADS_A ranged from 0 to 11. Anxiety levels were low overall in both women who were pre- treatment and presently in treatment. However, outliers were identified in the in treatment group of women (n=3), who scored higher on the anxiety measure (Figure 5.4). For significant others the HADS_A scale indicated low levels of anxiety. In terms of comparison with women with breast cancer, significant others scored lower for levels of anxiety (Table 5.6). The next section presents the scores for the depressive symptoms scale of the HADS instrument.

Table 5.6 Anxiety Levels for Sample as Indicated on the Hospital Anxiety and Depression Scale (HADS)

		Women with Breast Cancer (Total) (n=147)			Significant Other (Total) (n=127)		
Variable	Possible range	Observed range	Mean(SD)	Median(IQR)	Observed range	Mean(SD)	Median(IQR)
Anxiety	0 to 21	0 to 11	2.3 (2.36)	1(0 to 4)	0 to 6	1.2 (1.47)	1(0 to 2)
		Women with Breast Cancer Pre Treatment (n=81)			Women with Breast Cancer In Treatment (n=66)		
Variable	Possible range	Observed range	Mean(SD)	Median(IQR)	Observed range	Mean(SD)	Median(IQR)
Anxiety	0 to 21	0 to 11	3 (2.58)	3(0 to 6)	0 to 7	1.4 (1.7)	1(0 to 4)
		Women with Breast Cancer in Dyad (n=114)			Significant Other in Dyad (n=114)		
Variable	Possible range	Observed range	Mean(SD)	Median(IQR)	Observed range	Mean(SD)	Median(IQR)
Anxiety	0 to 21	0 to 11	2.1(2.43)	1(0 to 4)	0 to 6	1.2(1.5)	0.5(0 to 2.25)

Table 5.6 shows data on the anxiety symptoms subscale of the Hospital Anxiety and Depression scale for women with breast cancer (n=147) and significant others (n=127). Higher scores on the anxiety subscale indicates higher levels of anxiety. A score of 0-7=Normal (n=139 women with breast cancer, n=127 significant others), 8-10=Borderline abnormal (n=8 women with breast cancer), 11-21=Abnormal (case).

Figure 5.4 Distribution of Anxiety Level Scores for Women with Breast Cancer

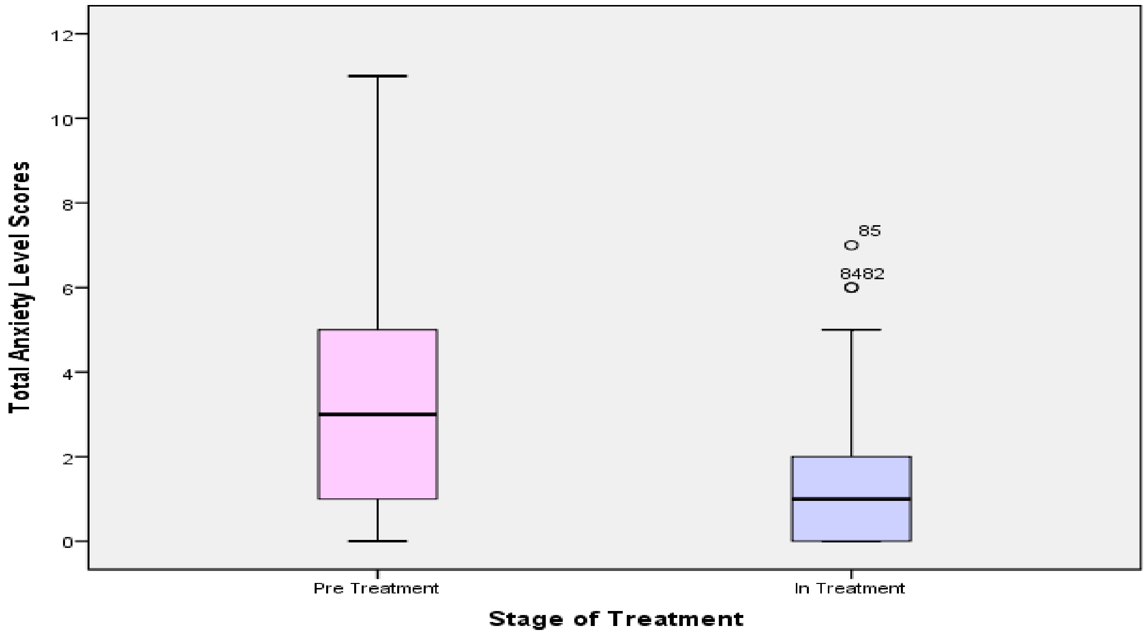


Figure 5.4 shows data on the anxiety subscale of the Hospital Anxiety and Depression scale for women with breast cancer (n=147) categorised by stage of treatment. Possible range 0-21, higher scores on the anxiety subscale indicates higher levels of anxiety. A score 0-7 = Normal, 8-10 = Borderline abnormal (borderline case), 11-21 = Abnormal (case). Noticeable outliers at 82, 84 and 85, but still were within 0-7 normal range. Pre=women with breast cancer in pre-treatment stage (n=81). Post=women with breast cancer in in treatment stage (n=66).

Hospital Anxiety and Depression Scale_ Depressive Symptoms (HADS_D)

The HADS_ D aspect of the scale focuses on depressive symptoms and asks participants to rate from 0-3 their responses to each statement. In terms of comparison between women pre and in treatment, scores were distributed between the two groups with noticeable differences. Women with breast cancer in the pre-treatment phase had higher scores than women with breast cancer in the in treatment phase, although there were outliers who scored higher–within the in treatment group – those values were still lower than the highest values in the pre group (n=7) (Figure 5.5). For significant others, scores indicated low levels of depressive symptoms.

Table 5.7 Depressive Symptoms for Sample as Indicated on the Hospital Anxiety and Depression Scale (HADS)

		Women with Breast Cancer (Total) (n=147)			**Significant Other (Total) (n=127)**		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Depressive Symptoms	0 to 21	0 to 7	1.5(1.82)	1(0 to 3)	0 to 5	0.5(0.98)	0(0 to 1)
		Women with Breast Cancer Pre Treatment (n=81)			**Women with Breast Cancer In Treatment (n=66)**		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Depressive Symptoms	0 to 21	0 to 7	2.0(1.99)	2(0 to 5)	0 to 5	0.7(1.26)	0(0 to 3)
		Women with Breast Cancer in Dyad (n=114)			**Significant Other in Dyad (n=114)**		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Depressive Symptoms	0 to 21	0 to 7	1.3(1.73)	0(0 to 3)	0 to 5	0.5(1.02)	0(0 to 1)

Table 5.7 shows data on the depressive symptoms subscale of the Hospital Anxiety and Depression scale for women with breast cancer (n=147) and significant others (n=127). Higher scores on the depressive symptoms subscale indicates higher levels of depressive symptoms. A score 0-7 = Normal (n=146 women with breast cancer, n=, 127 significant others), 8-10 = Borderline abnormal (n=1 woman with breast cancer), 11-21 = Abnormal (case).

Figure 5.5 Distribution of Depressive Symptoms Scores for Women with Breast Cancer

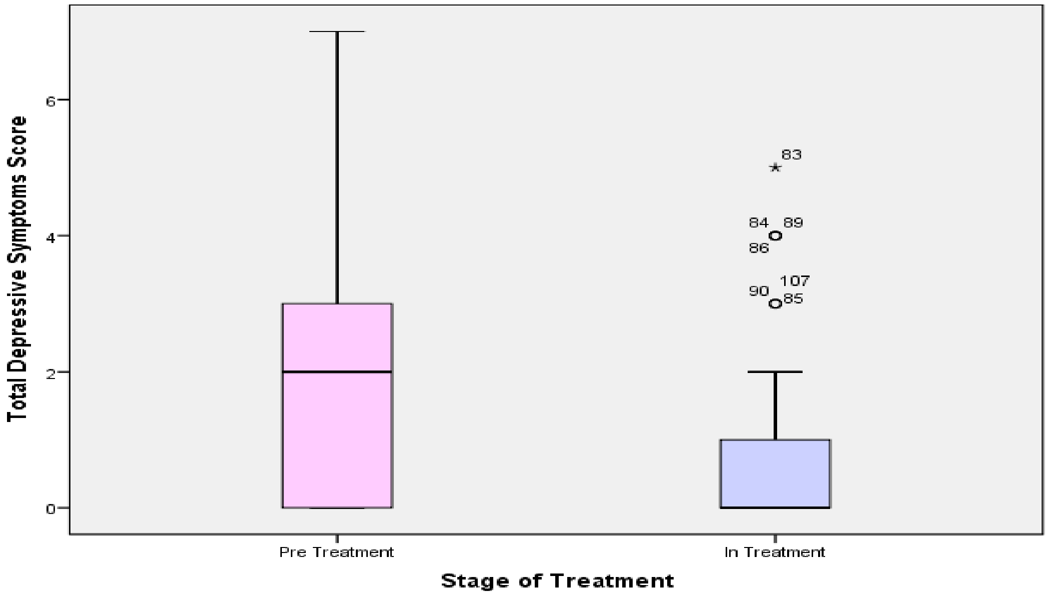


Figure 5.5 shows data on the depressive symptoms subscale of the Hospital Anxiety and Depression scale for women with breast cancer (n=147) by stage of treatment. Possible range 0-21, higher scores on the subscale indicates higher levels of depressive symptoms. A score 0-7 = Normal, 8-10 = Borderline abnormal (borderline case), 11-21 = Abnormal (case). Noticeable outliers present at 83, 84, 85, 86, 89, 90 and 107, but still within the normal range of 0-7. Pre=women with breast cancer in pre-treatment stage (n=81). Post=women with breast cancer in treatment stage (n=66).

5.2.7 Health Outcome: Quality of Life

Objective 4: Describe the health outcomes i.e. quality of life of women with breast cancer and their significant other.

The quality of life of individual participants was categorised using the Functional Assessment to Cancer Therapy scale (FACIT, 2014) for breast cancer (FACT-B) for the woman with breast cancer and the General Population (FACT-GP) for their significant other. Women with breast cancer and their significant other were asked about their quality of life pertaining to four subscales relating to: Physical well-being (PWB); Social/ Family well-being (SFWB); Emotional well-being (EWB) and Functional well-being (FWB). Each of these four subscales make up the FACT-GP and scores are added together to give an overall quality of life score. For women with breast cancer a further 10 additional questions pertaining to symptoms, the Breast Cancer Subscale (BCS) were also asked, the addition of these ten items makes up the FACT-B scale. A FACT-GP (4 subscales) score was calculated both for women with breast cancer and their significant other, while a FACT-B score was calculated for women with breast cancer only. Each of the subscales on the FACT-GP/FACT-B will now be presented.

Physical Wellbeing

This section of the FACT-GP/FACT-B scale asked participants about their physical health (e.g. I have less energy than before), with 7 items on a Likert scale from 0-4 (0=not at all, 4= very much). Some of the items on this subscale were reverse coded. Higher scores indicates higher levels of physical wellbeing. Scores for women with breast cancer in the in treatment group were higher (*M*=26.8, *SD*=2.05) compared to those in the pre-treatment group (*M*=24.1, *SD*=3.19). In this subscale quality of life was rated as being lower for significant others than the women with breast cancer, although not significantly.

Table 5.8(a) Physical Wellbeing for Women with Breast Cancer and Significant Others

		Women with Breast Cancer (Total) (n=147)			**Significant Other (Total) (n=127)**		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Physical wellbeing	0 to 28	16 to 28	25.3(3.04)	27(21 to 28)	22 to 24	23.7(0.57)	24(24 to 24)
		Women with Breast Cancer Pre Treatment (n=81)			**Women with Breast Cancer In Treatment (n=66)**		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Physical wellbeing	0-28	16 to 28	24.1(3.19)	24(20 to 28)	21 to 28	26.8(2.05)	28(23 to 28)
		Women with Breast Cancer in Dyad (n=114)			**Significant Other in Dyad (n=114)**		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Physical wellbeing	0 to 28	16 to 28	25.5(3.13)	27(23 to 28)	22 to 24	23.7(0.52)	24 (24 to 24)

Table 5.8(a) shows data on the physical wellbeing subscale of the FACT-GP/FACT-B scale for women with breast cancer (n=147) and significant others (n=127). Higher scores on the physical wellbeing subscale indicates higher/better physical wellbeing.

Social/Family Wellbeing

In this section women and their significant others were asked about their family and friends (e.g. I am satisfied with my family communication about my illness), using a 7 item, 4 point Likert scale with responses ranging from 0 (not at all) to 4 (very much). Higher scores indicate better levels of social/family wellbeing. Scores for women with breast cancer, indicated good social and family wellbeing. Social and family wellbeing scores were also high for significant others (Table 5.8(b)). However, on this scale significant others scored the lowest out of all the subscales on the FACT-GP.

Table 5.8(b) Social and Family Wellbeing for Women with Breast Cancer and Significant Others

		Women with Breast Cancer (Total) (n=147)			**Significant Other (Total) (n=127)**		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Social/family wellbeing	0 to 28	16 to 28	23.0(2.81)	23(20 to 27)	14 to 20	18.1(1.71)	18 (17 to 20)

		Women with Breast Cancer Pre Treatment (n=81)			**Women with Breast Cancer In Treatment) (n=66)**		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Social/family wellbeing	0 to 28	16 to 28	22.6(2.93)	22(19 to 27)	18 to 28	23.6(2.55)	23(20 to 27)

		Women with Breast Cancer in Dyad (n=114)			**Significant Other in Dyad (n=114)**		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Social/family wellbeing	0 to 28	16 to 28	23.1(2.79)	23 (21 to 26)	14 to 20	18.1(1.76)	18 (17 to 20)

Table 5.8(b) shows data on the social/family wellbeing subscale of the FACT-GP/FACT-B scale for women with breast cancer (n=147) and significant others (n=127). Higher scores on the social/family wellbeing subscale indicates higher/better social and family wellbeing. Significant others scored the lowest on this scale of the 4 subscales within the FACT-GP.

Emotional Wellbeing

For emotional wellbeing participants were asked about the emotions and feelings that they experienced within the past week (e.g. “I feel sad”), with some of the items being reverse coded. Women with breast cancer and their significant other were asked to rate how applicable each statement was to them on a scale from 0-4 (0=not at all, 4=very much). Higher scores indicate better emotional wellbeing.

Table 5.8(c) Emotional Wellbeing for Women with Breast Cancer and Significant Others

		Women with Breast Cancer (Total) (n=147)			Significant Other (Total) (n=127)		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Emotional wellbeing	0 to 24	10 to 24	18.0(3.42)	18(13 to 23)	0 to 16	14.0(2.69)	15(13 to 16)
		Women with Breast Cancer Pre Treatment (n=81)			**Women with Breast Cancer In Treatment (n=66)**		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Emotional wellbeing	0 to 24	10 to 24	16.4(2.95)	16(13 to 20)	12 to 24	19.8(3.04)	20(14 to 24)
		Women with Breast Cancer in Dyad (n=114)			**Significant Other in Dyad (n=114)**		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Emotional wellbeing	0 to 24	10 to 24	18.0(3.44)	18(15 to 20)	0 to 16	14.0(2.73)	15(13 to 16)

Table 5.8(c) shows data on the emotional wellbeing subscale of the FACT-GP/FACT-B scale for women with breast cancer (n=147) and significant others (n=127). Higher scores on the emotional wellbeing subscale indicates higher/better emotional wellbeing.

Functional Wellbeing

This part of the questionnaire asked questions relating to ability to work, play, rest and sleep (e.g. "I am enjoying the things I usually do for fun"). Functional wellbeing was measured by asking women with breast cancer and their significant other to rate on a scale from 0-4 how strongly they agreed or disagreed which each of the statements (0=not at all, 4= very much). Higher scores indicate better functional wellbeing, some items are reverse coded. Women with breast cancer in the in treatment group scored slightly higher than those in the pre-treatment group. Rationale for this may be attributed to women being so close to the time of diagnosis and hence functional wellbeing may have been immediately effected. Women with breast cancer overall had higher mean scores and same median values as significant others (Table 5.8 (d)).

Table 5.8(d) Functional Wellbeing for Women with Breast Cancer and Significant Others

		Women with Breast Cancer (Total) (n=147)			Significant Other (Total) (n=127)		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Functional wellbeing	0 to 28	13 to 28	22.4(3.91)	22(17 to 28)	16 to 24	21.5(2.15)	22(20 to 23)

		Women with Breast Cancer Pre Treatment (n=81)			Women with Breast Cancer In Treatment (n=66)		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Functional wellbeing	0 to 28	13 to 28	20.7(3.66)	20(17 to 27)	17 to 28	24.4(3.19)	25(19 to 28)

		Women with Breast Cancer in Dyad (n=114)			Significant Other in Dyad (n=114)		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Functional wellbeing	0-28	13 to 28	22.7(4.01)	23(19 to 26.25)	16 to 24	21.5(2.19)	22(19.75 to 23)

Table 5.8(d) shows data on the functional wellbeing subscale of the FACT-GP/FACT-B scale for women with breast cancer (n=147) and significant others (n=127). Higher scores on the functional wellbeing subscale indicates higher/better functional wellbeing.

Additional Concerns (applicable to women with breast cancer only)

In this section of the questionnaire women with breast cancer were asked to rate on a 4 point Likert scale their response to 10 statements about the symptoms associated with breast cancer and its treatments. These questions dealt with; experiencing shortness of breath, self-consciousness about dressing, swelling/tenderness in arms, ability to feel attractive, bothered by hair loss, worry about other family members getting the same illness, worry about the effect of stress on illness, changes in weight, ability to feel like a woman, experience of pain. High scores on additional concerns means quality of life is not affected by or is minimally affected by these issues, as the scale has reversed coded items.

The three concerns which were indicated most by women were: worry that other family members would get the same illness (n=35 “very much”), self-consciousness about appearance (n=25 “very much”) and the effects of stress on their illness (n=22 “very much”). Other concerns such as sexual attractiveness, ability to feel like a woman, swelling of arms, weight changes were indicated by fewer women. Overall, woman who were pre-treatment indicated more negative concerns in relation to symptoms. Thus, in terms of additional concerns, women with breast cancer who were involved in treatment scored higher, indicating fewer issues with symptoms/treatments relating to breast cancer.

Table 5.8(e) Additional Concerns for Women with Breast Cancer

		Women with Breast Cancer (Total) (n=147)		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Additional Concerns	0 to 40	21 to 40	30.7(4.88)	31(23.8 to 36)

		Women with Breast Cancer Pre Treatment (n=81)			Women with Breast Cancer In Treatment (n=66)		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Additional Concerns	0 to 40	21 to 40	28.8(4.4)	29(23 to 35)	23 to 40	33(4.45)	34(24 to 38)

Table 5.8(e) shows data on the Additional Concerns subscale of the FACT-GP/FACT-B scale for women with breast cancer (n=147). Higher scores indicates fewer additional concerns as the scale is reversed scored.

Overall Quality of Life for FACT-GP

Following on from the individual subscales on Physical Wellbeing, Social/Family Wellbeing, Emotional Wellbeing and Functional Wellbeing, all scores were added up to get an overall total score for the FACT-GP for women with breast cancer and significant others. Overall quality of life scores (FACT-GP) were high among women with breast cancer. Overall, quality of life scores (FACT-GP) for significant others also indicated a good quality of life (Figure 5.7). In terms of comparison between women with breast cancer and significant others, women with breast cancer reported higher quality of life scores (FACT-GP) than significant others (Table 5.9). Comparison on FACT-B was not feasible as this was completed by women with breast cancer only

Table 5.9 Quality of Life for Women with Breast Cancer and Significant Others

		Women with Breast Cancer (Total) (n=147)			Significant Other (Total) (n=127)		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Functional Assessment Cancer Therapy-Breast **FACT-B**	0 to 148	87 to 144	119.3(14.38)	122(105 to 131)	-	-	-
Functional Assessment Cancer Therapy-General **FACT-GP**	0 to 108	66 to 105	88.6(10.61)	90 (80 to 90)	66 to 84	77.3(4.25)	78(75 to 80)
		Women with Breast Cancer Pre Treatment (n=81)			**Women with Breast Cancer in Treatment (n=66)**		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Functional Assessment Cancer Therapy-Breast **FACT-B**	0 to 148	87 to 144	112.6(12.95)	112(97.2 to 129.8)	95 to 142	127.6(11.5)	131(108.7 to 139.3)
Functional Assessment Cancer Therapy-General **FACT-GP**	0 to 108	66 to 104	83.8(9.59)	83(71.2 to 96.8)	72 to 105	94.6(8.62)	97(80.3 to 103.3)
		Women with Breast Cancer in Dyad (n=114)			**Significant Other in Dyad (n=114)**		
Variable	**Possible range**	**Observed range**	**Mean(SD)**	**Median(IQR)**	**Observed range**	**Mean(SD)**	**Median(IQR)**
Functional Assessment Cancer Therapy-General **FACT-GP**	0 to 108	66 to 105	89.3(10.86)	91(81 to 98.25)	66 to 84	77.3(4.30)	78(75 to 80.25)

Table 5.9 shows data on the FACT-GP/FACT-B quality of life scales for women with breast cancer (n=147) and significant others (n=127). No FACT-B results available for significant others as this scale was specific to women with breast cancer only. Possible range FACT-GP (0-108), possible range FACT-B (0-148). Higher scores indicates higher/better quality of life. As evident from the above Table 5.10 women in the pre-treatment group had a lower QOL score than women in the in treatment group. Significant others QOL was also lower than women with breast cancer.

Figure 5.6 Distribution of Quality of Life Scores for Women with Breast Cancer

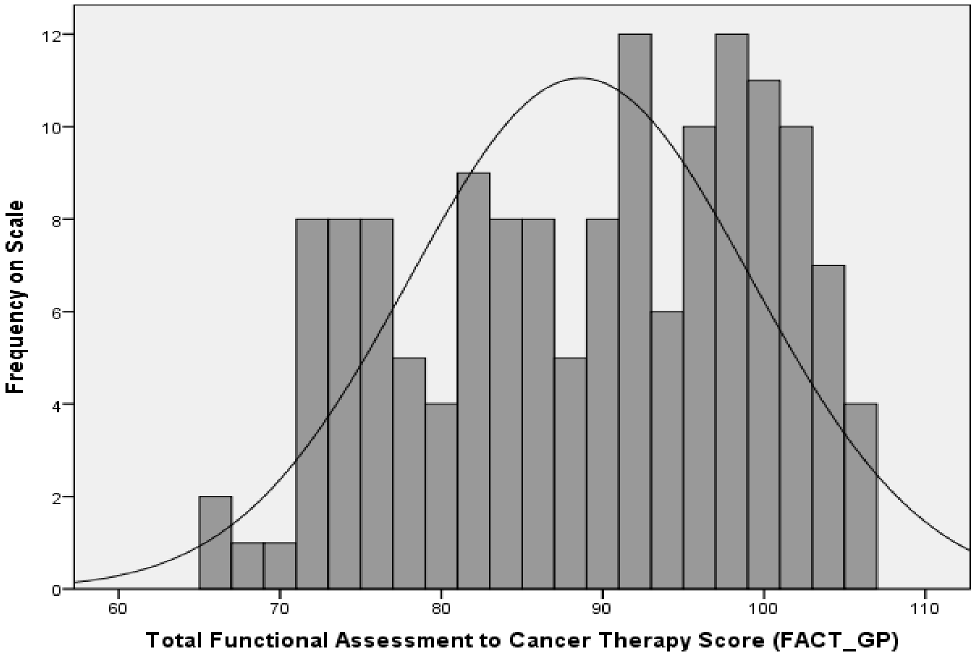


Figure 5.6 shows the distribution of scores for women with breast cancer (n=147) in terms of quality of life categorised by FACT-GP. Possible range 0-108*, higher score indicates better quality of life

--- Depicts normal distribution curve.

Mean=88.6, SD=10.61.

Figure 5.7 Distribution of Quality of Life Scores for Significant Others

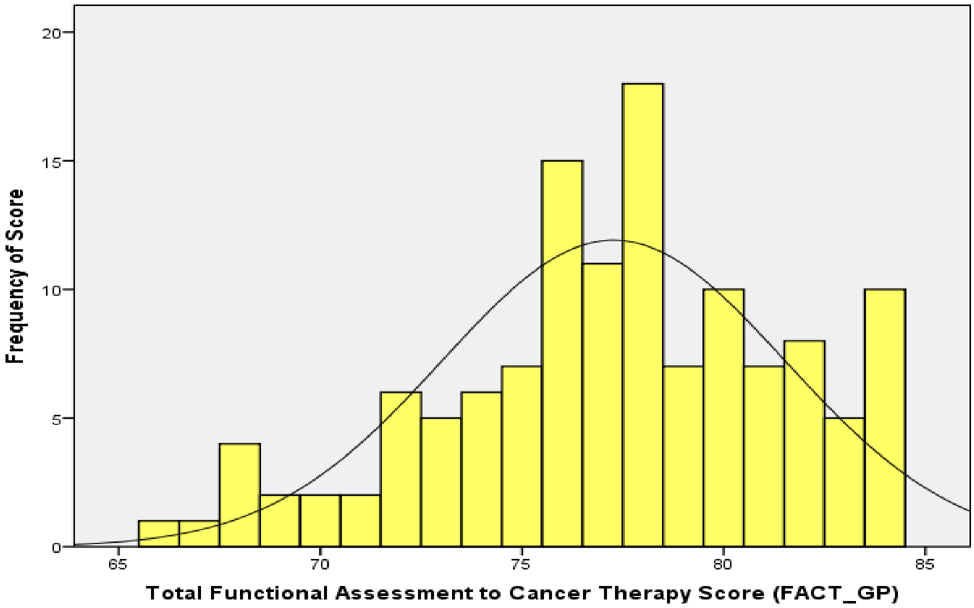


Figure 5.7 shows the distribution of scores for significant others (n=127) in terms of quality of life as categorised by FACT-GP. Possible range 0-108*, higher score indicates better quality of life

----- Depicts normal distribution curve.

Mean=77.3, SD=4.25.

Overall Quality of Life for FACT-B

Women with breast cancer also completed the 10 additional items on the BCS thus, making up the FACT-B scale. The histogram for the distribution of QOL score on the FACT-B (women with breast cancer only) showed an even distribution. Quality of Life scores on FACT-B were higher in women in the in treatment group as opposed to women who were in the pre-treatment group (Table 5.10) (Figure 8.2). Women with breast cancer in the in treatment group included those who were undergoing surgery, chemotherapy and/or radiotherapy and those who were attending the outpatient clinic.

Figure 5.8 Distribution of Quality of Life Scores for Women with Breast Cancer by Stage

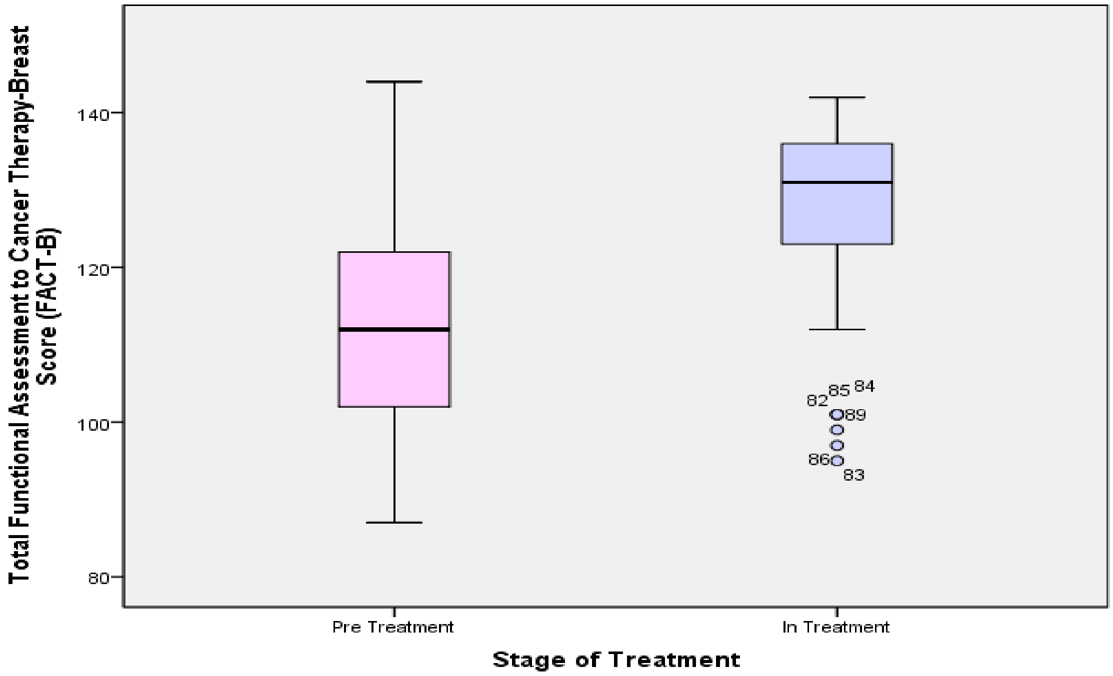


Figure 5.8 shows the distribution of scores for women with breast cancer (n=147) in terms of quality of life as categorised by FACT-B and segmented in terms of stage of treatment. Possible range 0-148*, higher score indicates better quality of life
----- Depicts normal distribution curve. Mean=119.3, SD=14.38.
Pre Treatment= women who were in the pre-treatment group (n=81),
In Treatment= women in the in treatment group (n=66). Outliers in the in treatment group (n=6) who scored lower.

In summary the descriptive statistics demonstrated that most women with breast cancer were between the ages of 55-64 years, Irish, Roman Catholic, married, had primary level education or higher, were employed and identified their significant other as their spouse.

In relation to significant others, most were males (83%) between the ages of 55 and 64 years, Irish, Roman Catholic, married, had a secondary level education, were employed and stated their relationship to the woman with breast cancer as spousal.

In terms of relationship orientation most women with breast cancer indicated secure as their attachment style (categorical) with low levels of anxiety (Model of Self) and avoidance (Model of Other) (continuous), this was also evident for significant others. Most women with breast cancer and their significant others indicated high scores on supportive behaviours. Relationship satisfaction was rated as high for both the woman with breast cancer and her significant other. Scores on the HADS scale indicated low levels of anxiety and depressive symptoms for women with breast cancer and their significant others. Quality of life was rated as high for significant others but was higher for women with breast cancer. The next section details the textual data that was obtained in the study through an open ended question within the questionnaire.

5.2.8 Analysis of Textual Data

Objective 6: Explore the experiences and relationships of women with breast cancer and their identified significant other of the breast cancer diagnosis trajectory.

The last section of the questionnaire asked participants if they had any further comments that they would like to make regarding their relationship with their significant other whilst coping with a diagnosis of breast cancer. Of the total population group in the study for women with breast cancer (n=147), only a small number (n=11) utilised this section. For significant others only 3 completed this section. These comments were reviewed using qualitative content analysis (Parahoo, 2014), the emergent issues are presented in (Appendix 24). Among the issues identified for the woman with breast cancer were; the time of the diagnosis as being the most difficult, the presence of worry or uncertainty, the importance of support from significant others/family/friends and the necessity of closeness. The issues that were expressed by significant others included; the time of diagnosis as being difficult and the focus being on the woman with breast cancer and her getting well. These issues are presented individually under the identified categories.

Issue 1: Time of Diagnosis as Difficult

This issue was expressed by 4 out of the 11 women who completed the open comments section of the questionnaire. One woman in the 35-44 year age category, who was married, living with her spouse and employed stated that:

> *"The toughest part was when going through the diagnosis*" (ID: w088)

This appears synonymous with other women who also stated that the diagnosis was the most challenging time. One woman stated that it was "awful" (ID: w156) while another described it as a "hard road" (ID: w265). One woman stated that she found it "hard to tell her family and she worried how they would cope with the news" (ID: 156). These statements highlight that the diagnosis stage is a distressing time for women with breast cancer.

Significant others also identified the problems that can occur at the diagnosis stage and the presence of a lot of things going on at once around this time.

> *"Can be a lot going on at the start "(ID: s136)*

The above was stated by a man in his late 60s who was married to a woman diagnosed with breast cancer. Similar statements from significant others support the issue of diagnosis being the most difficult stating "it was the most difficult, but as time moved on it became easier." (ID: s247).

Issues 2: Worry or Uncertainty

The worry and uncertainty associated with a breast cancer diagnosis was an issue identified in the open comments. One woman who was middle aged and unmarried stated that:

"I worried how my family would react."(ID: W256)

Another woman stated that she was worried how her family would react while worry around telling people about the breast cancer was also identified. A woman expressed concern about how her husband would react to the diagnosis also stating that she was worried for her husband and her family.

"When diagnosed it's how your family will react that is most worrying" (ID: w011).

Issue 3: Importance of Support from Significant Other/Family/Friends

Support was identified as being important to women with breast cancer. In general the comments were positive with most women stating they had support and were happy with their relationship.

"Family have been good" (ID: w110)

"Support was there for me" (ID: w118)

"Asking for help from family was difficult but overall they have been good" (ID: w176)

"Friends act as good support" (ID: w007)

"Husband attends hospital with me and went through same thing" (ID: w107)

Women mentioned different sources of support including husbands, family and friends. Support was seen as being available from a multitude of sources and not solely limited to spouse/family. Some women expressed a sense of the cancer bringing them closer to their loved ones and helping to support each other through, as identified in:

"*I and my partner helped each other through" (ID: w176)*

"Brought us closer" (ID: w007).

For other woman the significant other whom they identified was also highlighted as potentially being unsupportive or unable to provide support.

> *"My brother who I live with, is very traditional and doesn't discuss woman problems, he does not feel comfortable talking about breast cancer or completing the questionnaire" (ID: w256).*

The above highlights the awkwardness that male significant others may feel when discussing issues relating to women's health problems, specifically breast cancer. This woman was in her late 60's, single and lived with her brother who was her only living relative. She identified him as her significant other but due to the sensitivity of the study and the type of cancer she had she informed the researcher that his participation in the study would not be possible.

Issue 4: Focus on the Woman with Breast Cancer

One of the issues which presented in the open comments section for significant others was the focus being on the woman with breast cancer.

> *"The main focus was on her and getting her better and well again" (ID: s168)*

This was expressed by the middle aged male partner of a woman with breast cancer who was currently working and living with his spouse. The statement emphasised that often the focus was on her i.e. indicating his wife (the woman with breast cancer). This can be seen as suggestive of significant others feeling they are forgotten or left out of being involved in cared. The attention is on the woman with breast cancer. This statement gives a brief insight into the main area that significant others are concerned with when helping their loved ones with breast cancer. Often the significant other is more concerned with the woman and getting her well rather than focusing on themselves. Within breast cancer the primary focus is the woman, which may result in significant others feeling left out or without support.

5.3 Data Analysis using Inferential Statistics

This section of the chapter presents the findings of the study in relation to the inferential statistics, showing the associations between variables. This consisted of 2 parts, firstly the univariate analysis and then the multivariate analysis. Initially, the section begins with the univariate analysis between independent variables and quality of life. Univariate analysis was done using a simple linear regression. Quality of life (FACT-B/FACT-GP) was the dependent variable for all analyses. Independent variables were; select socio-demographics, relationship orientation (i.e. attachment style), relationship behaviours (i.e. support behaviours), relationship outcome (i.e. relationship satisfaction) and affective states (i.e. anxiety and depressive symptoms).

5.3.1 Univariate Analysis

Objective 5: Describe the association between select socio-demographics, relationship orientation, dyadic processes, affective states and health outcomes for the woman with breast cancer and her identified significant other both individually and within the dyad.

In this section the main objective was to determine if a correlation existed between each of the independent variables (including select socio-demographics) and quality of life. A linear regression is an appropriate analysis when the extent of a relationship between a dichotomous or interval/ratio predictor variable on an interval/ratio criterion variable are being tested. In this case, the predictor variable is the independent variable(s) and the criterion variable(s) is the dependent variable. The t-test was used to determine the significance of the predictor and beta coefficients were used to determine the magnitude and direction of the relationship. Regarding statistically significant models, for every one unit increase in the independent variable, the dependent variable will increase or decrease by the number of unstandardized beta coefficients (β) (Parahoo, 2014).

As this study had both categorical and continuous variables i.e. categorical (age group, marital status, education, employment status, relationship of significant other, phase of treatment, attachment style) and continuous (Model of Self, Model of Other, support, actual received support, need for support, support seeking, relationship satisfaction, anxiety and depressive symptoms), simple linear regression was used. This simple linear regression was conducted on the data for women with breast cancer (n=147) and significant others (n=127) using quality of life as the dependent variable.

Regression coefficients are interpreted using the *p*-value as well as the regression coefficient itself and the 95% confidence interval (CI). A low *p*-value (< 0.05) indicates rejection of the null hypothesis. Hence, a low *p*-value is an indication that a statistically significant relationship exists between the variables. Conversely, a larger *p*-value (>0.05) suggests that there is no relationship between the variables. Regression coefficients represent the mean change in the dependent variable for one unit of change in the independent variable. Coefficients can be interpreted as slopes. A negative coefficient indicates that when the independent variable increases the dependent variable decreases. A positive coefficient indicates that when the independent variable increases the dependent variable also increases (Parahoo, 2014).

5.3.2 Associations between Quality of Life and FACT-GP for Women with Breast Cancer (Univariate Analysis)

Five variables correlated with quality of life (FACT-GP) scores (Table 5.10). These were employment (p=0.044, β =3.54, 95% Confidence Interval(CI) 0.09 to 6.98), relationship of significant other (p=0.007, β =5.95, CI(95%) 1.63 to 10.27), phase of treatment (p<0.001, β =-10.810, 95% CI -13.81 to -7.80), anxiety (p<0.001, β =-2.44, 95% CI -3.06 to -1.82) and depressive symptoms (p<0.001, β =-3.16, 95% CI -3.96 to -2.35) (Table 5.10).

Table 5.10 Univariate Analysis of Variables and Quality of Life (FACT-GP) scores for Women with Breast Cancer (I)

Variables (Categorical)	n (%)	Regression coefficient β	(95% CI)	*p* value
Age Group				
18-34	6(4.1)	-11.52	(-21.12 to -1.92)	0.120
35-44	23(16.6)	-3.93	(-10.19 to 2.33)	
45-54	48(32.7)	-3.50	(-8.93 to 1.92)	
55-64	49(33.3)	-1.03	(-6.44 to 4.38)	
65+(ref*)	21(14.3)	0		
Marital Status				
Married/living with partner	121(82.3)	3.58	(-1.02 to 8.19)	0.127
Not Married (ref*)	26(17.6)	0		
Education				
No formal	10(6.8)	4.40	(-11.97 to 20.77)	0.759
Primary	54(36.7)	5.30	(-9.92 to 20.52)	
Secondary	69(46.9)	6.61	(-8.55 to 21.77)	
Third Level	12(8.2)	3.33	(-12.81 to 19.48)	
Other (ref*)	2(4.1)	0		
Employment status				
Working for payment	82(55.8)	3.54	(0.09 to 6.98)	0.044**
Not working for payment (ref*)	65(44.2)	0		
Relationship to Significant other				
Spouse	116(78.9)	5.95	(1.63 to 10.27)	0.007**
Other not spouse(ref*)	31(21.1)	0		
Phase of Treatment				
Pre treatment	81(55.1)	-10.810	(-13.81 to -7.80)	<0.001**
In treatment (ref*)	66(44.8)	0		
Attachment Style				
Style A	86(58.5)	-1.04	(-4.99 to 2.90)	0.354
Style B	13(8.8)	-5.29	(-11.94 to 1.36)	
Style C	6(4.1)	-5.07	(-14.21 to 4.08)	
Style D (ref*)	42(28.6)	0		
Variables (Continuous)		**Regression coefficient β**	**(95% CI)**	***p* value**
Model Of Self		-0.24	(-0.81 to 0.336)	0.413
Model Of Other		-0.16	(-0.742 0.42)	0.578
Support (Overall)		-0.26	(-0.56 to 0.03)	0.083
Actual Received Support		-0.24	(-0.70 to 0.20)	0.280
Need For Support		-0.80	(-1.890 to 0.30)	0.154
Support Seeking		-0.62	(-1.40 to 0.15)	0.113
Relationship Satisfaction		0.03	(-0.49 to 0.60)	0.897
Anxiety		-2.44	(-3.06 to -1.82)	<0.001**
Depressive Symptoms		-3.16	(-3.96 to -2.35)	<0.001**

Table 5.10 shows correlations between dependent variable quality of life (as depicted by FACT-GP scores) and independent variables for women with breast cancer (n=147) using simple linear regression significance was established at $p \leq 0.05$. (ref*)=reference.=variables that show significant correlation with quality of life ($p \leq 0.05$). CI=Confidence Interval**

Employment

Employment status and quality of life of the woman with breast cancer were shown to be correlated. Women with breast cancer who indicated that they were currently working, had higher quality of life scores than women with breast cancer who were not (p=0.044, β =3.54). Increases in quality of life by 3.54 units was observed for women with breast cancer who were employed thus, women with breast cancer who were unemployed, working in the home, students or unable to work due to illness indicated poorer quality of life in terms of FACT-GP (Table 5.10). Thus, women with breast cancer who are employed have a mean score that is 3.54 units higher than women with breast cancer who are not employed.

Relationship of Significant Other

The relationship of the significant other to the woman with breast cancer was found to be associated with the quality of life of the woman with breast cancer. Women with breast cancer who identified their spouse as their significant other had higher quality of life scores than women with breast cancer who indicated their significant other as being from one of the other categories (p=0.007, β =5.95)(Table 5.10).

Phase of Treatment

Women with breast cancer who were in the pre-treatment phase had significantly lower quality of life scores compared to those who were in the in treatment group (p<0.001, β =-10.810) (Table 5.10).

Anxiety

In relation to anxiety levels, women with breast cancer who had more anxiety symptoms or who scored higher on the anxiety level scale, demonstrated poorer quality of life scores in terms of FACT-GP (p<0.001, β =-2.44) (Table 5.10). Thus, anxiety and quality of life for women with breast cancer were inversely or negatively correlated. In terms of quality of life, for every one unit increase in anxiety score, quality of life score decreased by 2.44 units. (Table 5.10).

Depressive Symptoms

Depressive symptoms were also negatively associated with quality of life for women with breast cancer in relation to the FACT-GP (p<0.001, β =-3.16). Women with breast cancer who indicated higher scores on the depressive symptoms scale had lower scores on the quality of life scale, indicating poorer quality of life (Table 5.10). In terms of quality of life this decreased by 1 unit for every increase of 3.16 units in anxiety (Table 5.10).

5.3.3 Associations between Quality of Life and FACT-B for Women with Breast Cancer (Univariate Analysis)

For women with breast cancer on the FACT-B scale, seven variables were associated with quality of life. These were employment, relationship of significant other, phase of treatment, support specifically support seeking behaviours, anxiety and depressive symptoms (Table 5.11).

Employment

Employment status and quality of life (FACT-B) of the woman with breast cancer were shown to be correlated. Women with breast cancer who indicated that they were currently working had higher quality of life scores in relation to FACT-B scores than women with breast cancer who were not employed or indicated working in the home, being a student or unable to work, (p=0.009, β =6.16) (Table 5.11).

Relationship of Significant Other

Women with breast cancer who identified their spouse as their significant other had higher quality of life scores than women who indicated any other relationship other than spousal as their significant other (p=0.005, β =8.41). Hence, in terms of quality of life, women who have their spouse as their significant other have better quality of life scores (Table 5.11).

Phase of Treatment

Women with breast cancer who were categorised as being in the pre-treatment phase had significantly lower quality of life scores when compared to women who were in the in treatment group (p<0.001, β =-15.02) (Table 5.11).

Table 5.11 Univariate Analysis of Variables and Quality of Life (FACT-B) scores for Women with Breast Cancer (II)

Variables (Categorical)	n (%)	regression coefficient β	(95% CI)	*p* value
Age Group				
18-34	6(4.1)	-14.81	(-27.76 to -1.86)	0.073
35-44	23(16.6)	-5.81	(-14.25 to 2.63)	
45-54	48(32.7)	-3.47	(-10.77 to 3.84)	
55-64	49(33.3)	0.41	(-6.88 to 7.71)	
65+ (ref*)	21(14.3)	0	. .	
Marital Status				
Married/living with partner	121(82.3)	5.15	(-1.08 to 11.37)	0.104
Not Married (ref*)	26(17.6)	0		
Education				
No formal	10(6.8)	1.067	(-7.98 to 10.12)	0.727
Primary	54(36.7)	1.963	(-4.79 to 8.71)	
Secondary	69(46.9)	3.275	(-3.34 to 9.89)	
Third Level(ref*)	12(8.2)	0a		
	2(4.1)			
Employment status				
Working for Payment	82(55.8)	6.16	(1.53 to 10.79)	0.009**
Not working for payment (ref*)	65(44.2)	0		
Relationship to Significant other				
Spouse	116(78.9)	8.41	(2.58 to 14.24)	0.005**
Other not spouse(ref*)	31(21.1)	0		
Phase of Treatment				
Pre treatment	81(55.1)	-15.02	(-19.06 to -10.98)	<0.001**
In treatment (ref*)	66(44.8)	0		
Attachment Style				
Style A	86(58.5)	-1.16	(-6.52 to 4.20)	0.450
Style B	13(8.8)	-4.99	(-14.03 to 4.04)	
Style C	6(4.1)	-8.43	(-20.85 to 3.99)	
Style D(ref*)	42(28.6)	0		
Variables (Continuous)		**regression coefficient β**	**(95% CI)**	***p* value**
Model Of Self		-0.24	(-0.82 to 0.34)	0.413
Model Of Other		-0.24	(-1.03 to 0.54)	0.544
Support (Overall)		-0.46	(-0.85 to -0.05)	0.029**
Actual Received Support		-0.44	(-1.04 to 0.17)	0.154
Need For Support		-1.24	(-2.73 to 0.25)	0.103
Support Seeking		-1.07	(-2.11 to -0.02)	0.045**
Relationship Satisfaction		-0.08	(-0.79 to 0.63)	0.826
Anxiety		-3.40	(-4.23 to -2.57)	<0.001**
Depressive Symptoms		-4.47	(-5.54 to -3.4)	<0.001**

Table 5.11 shows correlations between dependent variable quality of life (as depicted by FACT-B scores) and independent variables for women with breast cancer (n=147) using simple linear regression significance was established at $p \leq 0.05$. (ref*)=reference.
****=variables that show significant correlation with quality of life ($p \leq 0.05$).**
CI=Confidence Interval

Support-Support Seeking Behaviours

Support seeking behaviours were found to be negatively associated with quality of life for women with breast cancer in terms of FACT-B scores (p=0.045, β =-1.07). Women who scored higher on the support seeking subscale, indicating more support seeking behaviours, had poorer quality of life scores (Table 5.11).

Anxiety

In terms of anxiety levels, women with breast cancer who scored higher on the anxiety scale demonstrated lower quality of life scores in terms of FACT-B ($p<0.001$, $\beta = -3.40$) (Table 5.11). Thus, anxiety and quality of life for women with breast cancer were negatively correlated.

Depressive Symptoms

Depressive symptoms were also negatively associated with quality of life for women with breast cancer in relations to the FACT-B ($p<0.001$, $\beta = -4.47$). Women with breast cancer who had higher scores on the depressive symptoms scale had poorer quality of life scores (Table 5.11).

5.3.4 Associations between Quality of Life and FACT-GP for Significant Others (Univariate Analysis)

For significant others on the FACT-GP, six variables were found to be associated with quality of life. These were age, educational level, and relationship of the significant other to woman with breast cancer, support, anxiety and depressive symptoms (Table 5.12).

Table 5.12 Univariate Analysis of Variables and Quality of Life (FACT-GP) scores for Significant Others

Variables (Categorical)	n (%)	regression coefficient β	(95% CI)	*p* value
Age Group				
18-34	5(3.9)	-5.68	(-9.81 to -1.56)	0.040 **
35-44	27(21.3)	0.69	(-1.77 to 3.15)	
45-54	34(26.8)	-0.74	(-3.09 to 1.61)	
55-64	42(33.1)	-0.42	(-2.69 to 1.85)	
65+ (ref*)	19(15.0)	0		
Gender				
Male	105(82.7)	1.64	(-0.32 to 3.60)	0.100
Female (ref*)	22(17.3)	0		
Marital Status				
Married	100(87.4)	1.23	(-1.42 to 3.88)	0.360
Not Married (ref*)	27(21.25)	0		
Education				
No formal	9(7.1)	4.89	(0.32 to 9.46)	0.021 **
Primary	39(30.7)	6.18	(2.29 to 10.07)	
Secondary	74(58.3)	5.19	(1.40 to 8.97)	
Third Level (ref*)	5(3.9)	0		
Employment status				
Working for payment	105(82.7)	-0.41	(-3.33 to 2.51)	0.783
Not working for payment (ref*)	22(17.3)	0		
Relationship to Significant other				
Spouse	104(81.9)	2.34	(0.44 to 4.25)	0.016 **
Other (ref*)	43(18.1)	0		
Attachment Style				
Style a	76(59.8)	0.31	(-1.31 to 1.94)	0.538
Style B	5(3.9)	-1.61	(-5.61 to 2.38)	
Style C	4(3.1)	-2.21	(-6.63 to 2.21)	
Style D (ref*)	42(33.1)	0		
Variables (Continuous)		**regression co efficient**	**(95% CI)**	***p* value**
Model Of Self		0.15	(-0.09 to 0.39)	0.221
Model Of Other		0.09	(-0.19 to 0.36)	0.534
Support (Overall)		-0.15	(-0.31 to 0)	0.050 **
Actual Provided Support		-0.15	(-0.38 to 0.07)	0.180
Need For Support		-0.23	(-0.69 to 0.24)	0.344
Support Seeking		-0.36	(-0.74 to 0.03)	0.071
Relationship Satisfaction		0.14	(-0.19 to 0.47)	0.400
Anxiety		-0.79	(-1.28 to -0.29)	0.002 **
Depressive Symptoms		-1.02	(-1.76 to -0.27)	0.008 **

Table 5.12 shows correlations between dependent variable quality of life (as depicted by FACT-GP scores) and independent variables for significant others (n=127) using simple linear regression with t tests (categorical), ANOVA (continuous), significance was established at *p*≤0.05.
(ref*)=reference
****=variables that show significant correlation with quality of life (*p*≤0.05).**
CI=Confidence Interval

Age

Age was found to be significantly associated with the QOL for significant others. Significant others who were between the ages of 35-44 years old indicated the highest quality of life (*p*=0.040, *β* =0.69, CI (95%) -1.77 to 3.15) (Table 5.12). This was followed by significant others in the 65+ category. Lowest quality of life scores were observed in the 18-34 year age group (β =-5.68), CI (95%) -9.81 to -1.56), followed by 45-54 year group (β =-0.74, CI (95%) (-3.09 to 1.61) and finally the 55-64 year age category (β =-0.42, CI (95%) -2.69 to 1.85).

Educational Level

Education was classified as either no formal, primary level, secondary level or third level. Significant others who indicated that they had primary level education also indicated highest quality of life scores on FACT-GP (*p*=0.021, *β* =6.18, CI (95%) 2.29 to 10.07), whilst those with third level education had the lowest mean score (Table 5.12).

Relationship to Significant Other

Significant others who indicated that the relationship they had with the woman with breast cancer was spousal had higher quality of life scores (*p*=0.016, *β* =2.43) (Table 5.12). This is similar to results found for women with breast cancer.

Support

Support overall was associated with quality of life for significant others (*p*=0.05, *β* =-0.15). Significant others of women with breast cancer who indicated greater levels of support demonstrated a lower quality of life on FACT-GP (Table 5.12).

Anxiety

As regards anxiety levels, significant others who scored higher on the anxiety scale had lower quality of life scores (*β*=-0.79, *p*=0.002) (Table 5.12).

Depressive Symptoms

The quality of life of significant others was negatively associated with depressive symptoms (*p*=0.008, *β*=-1.02) (Table 5.12).

Summary

In summary from the univariate analysis, in terms of women with breast cancer and quality of life as depicted from FACT-GP scores, QOL was associated with employment status (*p*=0.044), relationship to significant other (*p*=0.007), anxiety (*p*<0.001) and depressive symptoms (*p*<0.001), phase of treatment. FACT-B quality of life scores were associated with employment (*p*=0.009), relationship to significant other (*p*=0.005), support (*p*=0.029), anxiety (*p*<0.001) and depressive symptoms (*p*<0.001), phase of treatment.

In relation to significant others, quality of life was associated with age (*p*=0.04), educational status (*p*=0.021), relationship to woman with breast cancer (*p*=0.016), support (*p*=0.05), anxiety (*p*=0.002) and depressive symptoms (*p*=0.008). Although correlations were observed in the univariate analysis, a further multivariate analysis was conducted The aim of the multivariate analysis was to: (1) investigate which of the independent variables are significantly associated with the dependent variable after adjusting for the other independent variables in the model, and (2) to demonstrate how much of the variation in the dependent variable is explained by all of the independent variables together.

5.3.5 Multivariate Analysis

A multiple linear regression was conducted to assess if the independent variables predict the dependent variable (QOL). A multiple linear regression assesses the relationship among a set of dichotomous, or ordinal, or interval/ratio predictor variables on an interval/ratio criterion variable. Standard multiple linear regression—the enter method—was used. The standard method enters all independent variables (predictors) simultaneously into the model. Variables were evaluated by what they add to the prediction of the dependent variable which is different from the predictability afforded by the other predictors in the model. In Multi linear regressions, coefficients represent the mean change in the dependent variable for one unit of change in the independent variable while holding other independent variables in the model constant. This statistical control that regression provides is important because it isolates the role of one variable from all other variables in the model (Parahoo, 2014).

The assumptions of multiple regression—linearity, homoscedasticity and multicollinearity and how they were met in this study are presented in Appendix 25. Linearity assumes a straight line relationship between the predictor variables and the criterion variable, and homoscedasticity assumes that scores are normally distributed about the regression line (Hosmer and Lemeshaw, 2005). Linearity and homoscedasticity were assessed by examination of a scatter plot. The absence of multicollinearity assumes that predictor variables are not too related and was assessed using Variance Inflation Factors (VIF). VIF values over 10 suggest the presence of multicollinearity (Hosmer and Lemeshaw, 2005).

For this multivariate analysis those variables with a *p* value of ≤0.25 were included. The *p* level of ($p \leq 0.25$) was chosen as it is regarded as a suitable statistical screening criterion (Bendel and Afifi, 1977; Mickey and Greenland, 1989) in multivariate analysis (Hosmer and Lemeshaw, 2005). This *p* value maintains a broad enough range to ensure any potentially important variables are included in the analysis when compared with the normal level of 0.05, which has been shown to fail to identify potential variables of known clinical importance. Thus, for this study the wider inclusion figure of $p \leq 0.25$ was used. This is used as it can detect variables of clinical importance. For support the subscales were included and not the overall calculated score, as it was each individual scales which the study was concerned.

5.3.6 Associations between Quality of Life and FACT-GP for Women with Breast Cancer (Multivariate Analysis)

From the multivariate analysis, two variables were found to be associated with quality of life for women with breast cancer in terms of FACT-GP. These were phase of treatment and anxiety (Table 5.13).

Phase of Treatment

Quality of life and stage of treatment were significantly correlated. Women with breast cancer who were part of the pre-treatment group had lower quality of life scores (FACT-GP) by 7.17 units in comparison to women with breast cancer who were in the in treatment group (*p*<0.001) (Table 5.13).

Anxiety

Anxiety level was found to be negatively associated with quality of life as determined by FACT-GP scores. Women with breast cancer who had higher anxiety levels had lower quality of life (*p*=0.015, *β* =-1.01) (Table 5.13).

Table 5.13 Multivariate Analysis for Women with Breast Cancer (I) on FACT-GP

Variables (Categorical)	**Regression coefficient β**	**(95% CI)**	***p* value**
Age Group			
18-44	-5.31	(-10.40 to -0.22)	0.065
45-54	-5.27	(-10.15 to -0.40)	
55-64	-1.88	(-6.35 to 2.58)	
65+(ref*)	0		
Marital Status			
Married/living with partner	1.39	(-3.31 to 6.10)	0.560
Not Married (ref*)	0		
Employment status			
Working for Payment	2.35	(-0.77 to 5.47)	0.138
Other (ref*)	0		
Relationship to Significant other			
Spouse	2.92	(-1.69 to 7.52)	0.213
Other not spouse(ref*)	0		
Phase of Treatment			
Pre-treatment	-7.17	(-10.15 to -4.20)	<0.001**
In-treatment	0		
Variables (Continuous)	**Regression coefficient β**	**(95% CI)**	***p* value**
Support			
Need For Support	0.12	(-0.58 to 0.82)	0.735
Support Seeking	-0.51	(-1.51 to 0.49)	0.316
Anxiety	-1.01	(-1.82 to -0.20)	0.015**
Depressive Symptoms	-1.01	(-2.10 to 0.09)	0.070

Table 5.13 shows correlations between dependent variable quality of life (depicted by FACT-GP scores) and independent variables for women with breast cancer (n=144) using multivariate analysis. Variables in the univariate analysis with a *p*≤0.25 were included in the Multivariate Analysis. Age group and depressive symptoms are close to the cut-off of 0.05 and when outlier is removed, they are then statistically significant. (ref*)=reference. **=variables that are significant (p≤0.05).

5.3.7 Associations between Quality of Life and FACT-B for Women with Breast Cancer (Multivariate Analysis)

In terms of FACT-B six variables were shown to be correlated with quality of life. These were age, employment status, phase of treatment, actual received support, anxiety and depressive symptoms. These are further detailed below (Table 5.14).

Age

For women with breast cancer age was found to be associated with QOL scores on the FACT-B (p=0.006), with women with breast cancer who were in the older age categories, specifically 65+, indicating better quality of life than women with breast cancer in younger age groups (Table 5.14). The significant difference is between the youngest and oldest age groups.

Employment

Employment status was also found to be correlated with QOL for women with breast cancer on the FACT-B, with individuals who stated that they were currently working, indicating higher scores (p=0.032, β =4.33) in comparison to those who indicated that they were unemployed or currently not working for payment (Table 5.14).

Phase of Treatment

Stage of treatment showed significant correlation with quality of life. Women with breast cancer who were in the pre-treatment group had lower quality of life scores than women with breast cancer who were involved in ongoing treatment or post treatment (p<0.001, β =-10.30) (Table 5.14).

Actual Received Support

In relation to actual received support, higher scores on this subscale were correlated with higher quality of life (p=0.033, β=0.52). Thus, in terms of actual support that women with breast cancer receive, higher level of received support is associated with increased quality of life (Table 5.14).

Anxiety and Depressive Symptoms

Anxiety was negatively associated with quality of life for women with breast cancer. Women with breast cancer who indicated greater levels of anxiety had lower quality of life scores (p=0.018, β=-1.24) (Table 5.14).

Depressive symptoms were also negatively associated with quality of life for women with breast cancer (p=0.010, β=-1.86). Women with breast cancer who scored higher on the depressive symptoms subscale had lower quality of life scores (Table 5.14).

Table 5.14 Multivariate Analysis for Variables for Women with Breast Cancer (II) on FACT-B

Variables (Categorical)	Regression coefficient β	(95% CI)	*p* value
Age Group			
18-44	-8.02	(-14.46 to -1.59)	0.006**
55-54	-6.00	(-12.21 to 0.21)	
55-64	-0.41	(-6.11 to 5.30)	
65+ (ref*)	0		
Marital Status			
Married/living with partner	2.34	(-3.61 to 8.29)	0.437
Not Married (ref*)	0		
Employment status			
Working for Payment	4.33	(0.38 to 8.27)	0.032**
Other (ref*)	0		
Relationship to Significant other			
Spouse	3.17	(-2.68 to 9.01)	0.286
Other not spouse(ref*)	0		
Phase of Treatment			
Pre-treatment	-10.30	(-14.10 to -6.49)	<0.001**
In-treatment	0		
Variables (Continuous)	**Regression coefficient β**	**(95% CI)**	***p* value**
Support			
Actual Received Support	0.52	(0.04 to 0.99)	0.033**
Need For Support	-0.74	(-2.00 to 0.52)	0.248
Support Seeking	-0.20	(-1.10 to 0.70)	0.663
Anxiety	-1.24	(-2.26 to -0.22)	0.018**
Depressive Symptoms	-1.86	(-3.26 to -0.45)	0.010**

Table 5.14 shows correlations between dependent variable quality of life (as depicted by FACT-B scores) and independent variables for women with breast cancer (n=144) using multivariate analysis. Variables in the univariate analysis with a $p\leq0.25$ were included in the Multivariate Analysis,
(ref*) =reference. **=variables that show significant correlation with quality of life ($p\leq0.05$).

5.3.8 Associations between Quality of Life and FACT-GP for Significant Others (Multivariate Analysis)

In terms of significant others of women with breast cancer, quality of life (FACT-GP) scores were associated with support seeking/receipt behaviours. These are further detailed in the next section (Table 5.15).

Support Seeking/Receipt Behaviours

In relation to significant others, support seeking and receipt were identified as being negatively correlated with quality of life. Individuals who scored high on the support seeking behaviour subscale of the Berlin Social Support scale had lower quality of life scores (p=0.047, β=-0.42) (Table 5.15). This scale assesses the individual's way of seeking support. Higher scores indicate better/ more positive support seeking behaviours.

Table 5.15 Multivariate Analysis for Variables for Significant Others

Variables (Categorical)	Regression coefficient β	(95% CI)	*p* value
Age Group			
18-44	0.90	(-1.71 to 3.51)	0.560
55-54	-0.59	(-3.03 to 1.84)	
55-64	-0.40	(-2.67 to 1.89)	
65+ (ref*)	0		
Gender			
Male	12.16	(-6.02 to 1.76)	0.280
Female (ref*)	0		
Education			
No formal	2.38	(-2.85 to 7.60)	0.358
Primary	4.22	(-0.52 to 8.95)	
Secondary	3.21	(-1.44 to 7.87)	
Third Level (ref*)	0		
Relationship to Significant other			
Spouse	3.52	(-0.23 to 7.27)	0.065
Other (reference)	0		
Variables (Continuous)	**Regression coefficient β**	**(95% CI)**	***p* value**
Model Of Self	0.15	(-0.09 to 0.39)	0.222
Actual Support Received/Provided	0.01	(-0.22 to 0.24)	0.935
Support Seeking	-0.42	(-0.83 to -0.01)	0.047**
Anxiety	-0.52	(-1.09 to 0.06)	0.079
Depressive Symptoms	-0.58	(-1.46 to 0.30)	0.195

Table 5.15 shows correlations between dependent variable quality of life (as depicted by FACT-GP scores) and independent variables for significant others (n=127) using multivariate analysis. Variables in the univariate analysis with a $p \leq 0.25$ were included in the Multivariate Analysis, significance was established at $p \leq 0.05$.
(ref*)=reference. **=variables that show significant correlation with quality of life ($p \leq 0.05$).

In order for the results of the study to be valid and considered reliable certain assumptions must be met in relation to the multivariate linear regression. Details of these assumptions are outlined in Appendix 25.

In summary, the multivariate analysis showed that for women with breast cancer, FACT-GP scores were associated with phase of treatment and negatively correlated with anxiety, with women who were in the pre-treatment phase having lower quality of life scores and those with higher scores on anxiety level scale also having lower quality of life scores. FACT-B scores for women with breast cancer were shown to be correlated with age, employment status, and phase of treatment, actual received support, anxiety and depressive symptoms. Regarding significant others, FACT-GP scores were correlated with support seeking/receipt behaviours. This section has presented the univariate and multivariate analysis of the study variables for women with breast cancer (n=147) and significant others (n=127). The next section presents the findings from the modelling which was performed on the dyad data (n=114) only.

5.4 Modelling: Actor-Partner Interdependence Model

For this section of the analysis only data from participants that were part of a complete dyad i.e. where the questionnaire had been completed by both the woman with breast cancer and her identified significant other were analysed (n=114). This section of the analysis involved several steps: (1) deciding on a way of analysing the dyadic data, (2) setting up the dyadic data set and (3) analysing the dyadic data. The actor-partner interdependence model was chosen as the model to analyse the data for this section of the analysis (Kenny et al., 2006). This was chosen as it: encompasses a 2 person relationship which is applicable to this context; allows for the investigation of both the effect of a person's own independent variable on his or her QOL and the effect of their partner's independent variable score on their QOL; allows for a dependent variable to be investigated with predictor independent variables; provides a way of organising the data to give a clear picture of the results for both individuals in the dyad (Kenny et al., 2006). The data set up and analysis will now be discussed.

A multi-level model was used to analyse the associations between the dependent variable (quality of life as depicted by FACT-GP scores) and each of the independent variables (attachment style, support, relationship satisfaction, anxiety and depression). In the multi-level model, data from two dyad members (woman with breast cancer and her significant other) are treated as nested scores within a group that has an n=2 (Campbell and Kashy, 2002). Within the Actor –Partner Interdependence model one person assumes the title of the Actor whilst the other person in the dyad is referred to as Partner. The

"Actor" is the individual whose dependent variable is being investigated at the given time. Thus, in this model for example in dyad 001, initially, the women with breast cancer is the "Actor", then her significant other becomes the "Actor" and the woman with breast cancer assumes the role of Partner.

5.4.1 Data Set Up

The data had to be re-arranged for the dyad aspect of the data analysis. This set up required data to be re-arranged so that each individual's dependent variable score would be associated with his or her own independent variable scores as well as with the scores of his/her partner's independent variable scores. Therefore, for each couple/dyad two lines of data existed (one with the information for the significant other and one with the data for the woman with breast cancer). As the individuals in the dyad are distinguishable, i.e. one is the woman with breast cancer and the other her significant other, the first line for each couple contains the data from the woman with breast cancer and the second line contains the significant others data. The data are inputted for each individual independently such that each individual is treated as one case and there are two cases for each couple. Thus, although there were 114 dyads in the study, in SPSS this required 228 lines as each couple/dyad has 2 rows of data, one for the woman with breast cancer and one for her significant other.

Data were arranged as depicted in Table 5.16 (see also Appendix 26). The "Actor" in the model refers to the person themselves and their own scores, the "Partner" refers to the other individual who makes up the dyad. In this model each of the independent variables are analysed against the dependent variable (i.e. quality of life). Table 5.16 depicts the setup of the data pertaining to the dyads (n=114). In each row there is an ID which is the dyads ID i.e. where the woman's original ID code was w001 and the significant other s001 both their ID codes are now 001 so that they could be recognised as a pair.

For this model the person in the dyad whose dependent variable is being investigated i.e. whose quality of life score is the dependent variable is the "Actor", the "Partner" is the other person that makes up that dyad. The letter A is used to denote the "Actor" and the letter P is used to denote the "Partner", thus, A_GROUP refers to the group that the "Actor" or person being looked at refers to, A_ Satisfaction refers to the satisfaction of the Actor in the dyad. In the pink line the woman with breast cancer is the actor (Table 5.17). Thus, it is her quality of life score i.e. 100 that is being taken as the dependent variable. In the green line it is the significant others QOL score that is the dependent variable. All figures along the pink line refer to the woman with breast cancer as the actor. All values along the green line refer to the significant other as the "Actor".

Table 5.16 Example Data Set Up for Dyad in Actor-Partner Modelling

ID	DV	A_GROUP	P_GROUP	A_IV(1)	P_IV(1)	A_IV(2)	P_IV(2)
Code applied to participant	Dependant variable	The group the Actor belongs	The group the Partner belongs to	Independent variable (1) of Actor	Independent variable(1) of Partner	Independent variable (2) of Actor	Independent variable (2) of Partner

Table 5.16 shows the example of the data set up file for SPSS using the Actor-Partner Interdependence Model (APIM). The letter A denotes the Actor, the letter P denotes the Partner. The Actor denotes the person who is being looked at within the dyad. The Partner refers to the other individual in the dyad.

Table 5.17 Data Set Up for Dyad in Study

ID	FACT_G	A_GROUP	P_GROUP	A_Satisfaction	P_Satisfaction	A_HADS_A	P_HADS_A
Description	Quality of life score on FACT_G scale	1=woman with breast cancer 2=woman partner	1=woman with breast cancer 2=woman partner	Score on satisfaction scale (Actor)	Score on satisfaction scale (Partner)	Score on anxiety scale (Actor)	Score on anxiety scale (Partner)
001	100	1	2	28	24	5	4
001	89	2	1	24	28	4	5

Table 5.17 shows the data set up file for dyad (n=114) for SPSS using the APIM with the Dependent variable (quality of life) and 2 examples of the independent variables, relationship satisfaction and anxiety.
Blue line refers to variable name.
Grey line gives a description of what each column is referring to.
Pink line depicts values for woman with breast cancer.
Green line depicts values for significant other in the same dyad.

5.4.2 Data Analysis

For each independent variable of interest, the modelling consisted of three phases. For all phases QOL was the dependent variable. In the first phase, the actor's independent variable and his/her partner's independent variable were entered as main effects. This allowed the investigation of whether a person's QOL depended on their own independent variable score and/or their partner's independent variable score. In the second phase, group (woman with breast cancer/significant other) was added as a main effect. This allowed the investigation of the effect of a person's group on their QOL score while accounting for their own and their partner's independent variable scores. In the final phase, two interactions terms (group*actor's independent variable; group*partner's independent variable) were added to the model. This allowed the investigation of whether the relationship between a person's independent variable and their QOL depended on which group they belonged to (group*actor) and whether the relationship between their partner's independent variable and their QOL depended on which group their partner belonged to (group*partner). The associations between each of the variables in the model is outlined in Table 5.19 to 5.24. Although the modelling was run consecutively, for presentation purposes the tables have been reported separately. Following on from this, any variables that were found to be significant ($p \leq 0.05$) were included in a further analysis (Table 5.25).

As the data in the model (which was run concurrently) is quite extensive, it is represented in 6 tables although it is all part of the same modelling process. For clarity the Model for each variable is represented separately under the headings as depicted in the attachment framework i.e. Relationship Orientation, Relationship Behaviours, Relationship Outcomes and Affective States.

5.4.3 Relationship Orientation (i.e. Attachment Style) and Quality of Life

As previously stated, the relationship orientation variable has 2 parts to it. The first part relates to the self-identified attachment style of the individual. This is a categorical variable and so is not presented here as participants simply select which style best describes them. The second part relates to the Model of Self/Model of Others. As this involves participants rating their level of agreement with statements on a Likert scale and then a score is calculated indicating level of avoidance and level of anxiety in terms of attachment, it is a continuous variable.

The Actor-Partner Interdependence Model consisted of 3 phases/models (Model 1, Model 2 and Model 3). For attachment style, the first model (Model 1) involved determining if the persons' own attachment style was correlated with FACT-GP quality of life, no significant relationship was found (p=0.720). Regarding, the partner's attachment style no significant correlation with quality of life was detected (p=0.742). The next aspect of the model (Model 2) involved the persons' own attachment style, their partners' attachment style and the group that the person and their partner belonged to i.e. whether the woman with breast cancer or their significant other. For Model 2 the group that the significant other belongs to was found to be statistically significant (p<0.001), i.e. QOL differs between women with breast cancer and their significant other – with significant others having lower scores, on average.

In model 3, the person's attachment style, their partner's attachment style, and the group the person and their partner belong to were modelled with the person's attachment style as associated with the persons' group and the partner's attachment style as associated with the partners' group. The group the Partner belonged to remained significant (p<0.001, r=-13.50), thus, in terms of significant other the group they belong to influences their quality of life scores i.e. being a significant other of a woman with breast cancer is associated with QOL scores but attachment style had no association with QOL.

Model of Self/Model of Other

Model of Self and Model of Other were not found to be statistically significant, the group that the person belongs to was significant. Individuals who were in the significant other group had lower quality of life scores but no significance was observed with Model of Self/Model of Other scores (Table 5.19).

Table 5.19 Modelling in Actor-Partner Interdependence Model Relationship Orientation- Model of Self/Model of Other

Relationship Orientation **Model of Self** **Model 1**	**Regression coefficient β**	**(95% CI)**	***p*-value**
Persons Model of Self Partners Model of Self	0.15 -0.25	(-0.28 to 0.58) (-0.68 to 0.18)	0.485 0.251
Model 2			
Persons Model of Self Partners Model of Self Group Woman with breast cancer (ref*) Significant other	0.04 -0.14 0 -11.84	(-0.31 to 0.39) (-0.49 to 0.21 (-14.01 to-9.67)	0.824 0.438 <0.001**
Model 3			
Persons Model of Self Partners Model of Self Group Woman with breast cancer (ref*) Significant other Persons Model of Self * persons group Partners Model of Self * partners group	-0.12 -0.11 0 -12.18 0.29 -0.06	(-0.63 to 0.40) (-0.62 to 0.40) (-14.56 to -9.80) (-0.41 to 0.99) (-0.76 to 0.64)	0.657 0.681 <0.001** 0.414 0.872
Model of Other **Model 1**	**Regression coefficient β**	**(95% CI)**	***p*-value**
Persons Model of Other Partners Model of Other	-0.02 -0.32	(-0.45 to 0.45) (-0.78 to 0.16)	0.951 0.194
Model 2			
Persons Model of Other Partners Model of Other Group Woman with breast cancer (ref*) Significant other	-0.03 -0.30 0 -11.89	(-0.41 to 0.35) (-0.68 to 0.08) (-14.04 to -9.74)	0.879 0.127 <0.001**
Model 3			
Persons Model of Other Partners Model of Other Group Woman with breast cancer (ref*) Significant other Persons Model of Other * persons group Partners Model of Other * partners group	-0.16 -0.19 0 -12.36 0.26 -0.20	(-0.69 to 0.38) (-0.73 to 0.34) (-14.81 to -9.91) (-0.50 to 1.02) (-0.97 to 0.56)	0.564 0.473 <0.001** 0.505 0.603

Table 5.19 shows the Modelling for variables pertinent to Relationship Orientation including Model of Other and Model of Self using the Actor-Partner Interdependence Model, dyad (n=114), (ref*)=reference, breast cancer group is also the reference group for the interaction. **=variables that show significant correlation with quality of life (*p*≤0.05).

5.4.4 Relationship Behaviours (i.e. Support Seeking/ Receipt) and Quality of Life

In model 2 in terms of overall support and QOL, the group that the person themselves belonged to ($p<0.001$, β =-11.64) was significant (Table 5.20). In Model 3, no variables demonstrated significance (Table 5.20 and Table 5.21).

Actual Support

For actual support in Model 1, the persons' actual support was significant ($p<0.001$, β =-0.53). In Model 2, only the group that the significant other belonged to remained statistically significant ($p<0.001$, β =-11.80). In Model 3 for actual support, no significance was present for any of the variables (Table 5.20).

Table 5.20 Modelling in Actor-Partner Interdependence Model Relationship Behaviours

Relationship Behaviours **Support (Overall)** **Model 1**	**Regression coefficient β**	**(95% CI)**	***p*-value**
Persons Support	-0.29	(-0.56 to-0.03)	0.028
Partners Support	0.19	(-0.07to0.45)	0.158
Model 2			
Persons Support	-0.14	(-0.36 to 0.08)	0.220
Partners Support	0.03	(-0.19 to 0.25)	0.787
Group			
Woman with breast cancer (ref*)	0		
Significant other	-11.64	(-13.84 to -9.43)	<0.001**
Model 3			
Persons Support	-0.13	(-0.44 to 0.17)	0.393
Partners Support	0.01	(-0.30 to 0.31)	0.981
Group			
Woman with breast cancer (ref*)	0		
Significant other	-6.65	(-57.12 to 43.82)	0.795
Persons Support * persons group	-0.01	(-0.45 to 0.43)	0.965
Partners Support * partners group	0.06	(-0.39 to 0.50)	0.805
Actual Support **Model 1**	**Regression coefficient β**	**(95% CI)**	***P*-value**
Persons Actual Support	-0.29	(-1.25 to 0.19)	0.139
Partners Actual Support	0.21	(-0.18 to 0.60)	0.299
Model 2			
Persons Actual Support	-0.09	(-0.41 to 0.23)	0.584
Partners Actual Support	0.001	(-0.32 to 0.32)	0.991
Group			
Woman with breast cancer (ref*)	0		
Significant other	-11.80	(-14.01 to -9.59)	<0.001**
Model 3			
Persons Actual Support	-0.05	(-0.48 to 0.38)	0.815
Partners Actual Support	-0.01	(-0.44 to 0.42)	0.969
Group			
Woman with breast cancer (ref*)	0		
Significant other	-6.42	(-57.50 to 44.66)	0.805
Persons Actual Support * persons group	-0.09	(-0.74 to 0.56)	0.785
Partners Actual Support * partners group	0.02	(-0.63 to 0.67)	0.953

Table 5.20 shows the Modelling for variables pertinent to Relationship Behaviours including Support Overall and Actual Support using the Actor-Partner Interdependence Model, dyad (n=114), ref*=reference, **=variables that show significant correlation with quality of life ($p\leq0.05$).

Need for Support

For Model 1, the persons own need for support was significant (*p*=0.034, β =-0.97), however the group that the significant other belonged to that was also shown to be significant (*p*<0.001, *β*=-11.72). More importantly, when group was controlled for in the analysis, a person's own need for support was no longer significantly associated with QOL (Table 5.21).

Support Seeking

In Model 2, group (*p*<0.001, β =-11.81) was significant. In Model 3, no significance was observed (Table 5.21).

Table 5.21 Modelling in Actor-Partner Interdependence Model Relationship Behaviours (II)

Need for Support **Model 1**	**Regression coefficient β**	**(95% CI)**	***p*-value**
Persons Need for Support	-0.97	(-1.86 to -0.07)	0.034**
Partners Need for Support	0.55	(-0.34 to 1.45)	0.224
Model 2			
Persons Need for Support	-0.50	(-1.24 to 0.23)	0.180
Partners Need for Support	0.09	(-0.65 to 0.83)	0.811
Group			
Woman with breast cancer (ref*)	0		
Significant other	-11.72	(-13.90 to -9.54)	<0.001**
Model 3			
Persons Need for Support	-0.82	(-1.99 to 0.35)	0.170
Partners Need for Support	-0.24	(-1.41 to 0.92)	0.681
Group			
Woman with breast cancer (ref*)	0		
Significant other	-11.32	(-34.63 to 11.99)	0.339
Persons Need for Support * persons group	0.53	(-0.98 to 2.04)	0.487
Partners Need for Support * partners group	0.57	(-0.94 to 2.08)	0.459
Support Seeking **Model 1**	**Regression coefficient β**	**(95% CI)**	***p*-value**
Persons Support Seeking	-0.53	(-1.25 to 0.19)	0.151
Partners Support Seeking	0.39	(-0.33 to 1.11)	0.290
Model 2			
Persons Support Seeking	-0.40	(-0.98 to 0.19)	0.185
Partners Support Seeking	0.26	(-0.33 to 0.84)	0.391
Group			
Woman with breast cancer (ref*)	0		
Significant other	-11.81	(-13.97 to -9.65)	<0.001**
Model 3			
Persons Support Seeking	-0.46	(-1.30 to 0.37)	0.276
Partners Support Seeking	0.22	(-0.61 to 1.06)	0.603
Group			
Woman with breast cancer (ref*)	0		
Significant other	-12.78	(-37.96 to 12.40)	0.318
Persons Support Seeking * persons group	0.13	(-1.05 to 1.31)	0.824
Partners Support Seeking * partners group	0.07	(-1.11 to 1.25)	0.906

Table 5.21 shows the Modelling for variables pertinent to Relationship Behaviours including Need for Support and Support Seeking using the Actor-Partner Interdependence Model, dyad (n=114), ref*=reference. **=variables that show significant correlation with quality of life (*p*≤0.05).

5.4.5 Relationship Outcome (i.e. Relationship Satisfaction) and Quality of Life

For relationship satisfaction in Model 2, the group that the significant other belonged was highly significant (*p*<0.001, *β* =-12.06). However, in Model 3 no significance in terms of relationship satisfaction or group was observed (Table 5.22).

Table 5.22 Modelling in Actor-Partner Interdependence Model Relationship Outcome

Relationship Outcome **Relationship Satisfaction** **Model 1**	**Regression coefficient β**	**(95% CI)**	**p-value**
Persons Satisfaction	-0.18	(-0.67 to 0.32)	0.485
Partners Satisfaction	0.35	(-0.14 to 0.84)	0.161
Model 2			
Persons Satisfaction	0.19	(-0.22 to 0.59)	0.363
Partners Satisfaction	-0.01	(-0.42 to 0.40)	0.956
Group			
Woman with breast cancer (ref*)	0		
Significant other	-12.06	(-14.28 to -9.85)	<0.001**
Model 3			
Persons Satisfaction	0.21	(-0.31 to 0.72)	0.433
Partners Satisfaction	0.07	(-0.45 to 0.58)	0.792
Group			
Woman with breast cancer (ref*)	0		
Significant other	-17.06	(- 49.01 to 14.89)	0.294
Persons satisfaction * persons group	-0.04	(- 0.89 to 0.81)	0.927
Partners satisfaction * partners group	-0.22	(-1.06 to 0.63)	0.615

Table 5.22 shows the Modelling for variables pertinent to Relationship Outcome (relationship satisfaction) using the Actor-Partner Interdependence Model, dyad (n=114), ref*=reference. **=variables that show significant correlation with quality of life (*p*≤0.05).

5.4.6 Affective States (i.e. Anxiety and Depressive Symptoms) on Quality of Life

Anxiety

In terms of anxiety within the model, this was significantly related to quality of life. In Model 1, both the persons' own anxiety level (p<0.001, β =1.24) and their partners' anxiety level (*p*=0.01, β =-0.81) were significant. In Model 2 the persons' own anxiety level (*p*<0.001, *r*=-2.05) and the group that the significant other belonged to (p<0.001, β =-13.78) were identified as significant (Table 5.24). For Model 3, in terms of anxiety level, the persons' own anxiety (*p*<0.001, β =-2.49), and the group (*p*<0.001, β =-16.59) was significant (Table 5.23). The interaction was also significant, in that the effect of a person's own anxiety on their QOL is stronger for women with breast cancer than it is for those without breast cancer (significant others).

Depressive Symptoms

For depressive symptoms, in Model 1, both the persons' depressive symptoms (p<0.001, β=-1.68) and their partners' depressive symptoms (p=0.004, β=-1.28) were found to be significant. For Model 2, only the persons' depressive symptoms (p<0.001, β=-2.81) and the group that the significant other belonged to (p<0.001, β=-13.80) were significant. In Model 3, the persons' depressive symptoms (p<0.001, β=-3.40) and the group (p<0.001, β=-16.0) were significant (Table 5.23). The interaction was also significant, in that the effect of a person's own depressive symptoms on their QOL is stronger for women with breast cancer than it is for those without breast cancer (significant others).

Table 5.23 Modelling in Actor-Partner Interdependence Model (Affective States)

Affective States **Anxiety** **Model 1**	**Regression coefficient β**	**(95% CI)**	**P-value**
Persons HADS_A	-1.24	(-1.85 to -0.62)	<0.001**
Partners HADS_A	-0.81	(-1.43 to -0.20)	0.01**
Model 2			
Persons HADS_A	-2.05	(-2.52 to -1.58)	<0.001**
Partners HADS_A	0.01	(-0.47 to 0.48)	0.983
Group			
Woman with breast cancer (ref*)	0		
Significant other	-13.78	(-15.77 to -11.80)	<0.001**
Model 3			
Persons HADS_A	-2.49	(-3.03 to-1.94)	<0.001**
Partners HADS_A	0.04	(-0.51 to 0.58)	0.887
Group			
Woman with breast cancer (ref*)	0		
Significant other	-16.59	(-19.32 to -13.86)	<0.001**
Persons HADS_A * persons group	1.64	(0.61 to 2.68)	0.002**
Partners HADS_A * partners group	-0.33	(-1.37 to 0.70	0.526
Depressive Symptoms **Model 1**	**Regression coefficient β**	**(95% CI)**	**P-value**
Persons HADS_D	-1.68	(-2.55 to -0.81)	<0.001**
Partners HADS_D	-1.28	(-2.16 to -0.41)	0.004**
Model 2			
Persons HADS_D	-2.81	(-3.49 to -2.14)	<0.001**
Partners HADS_D	-0.15	(-0.82 to 0.52)	0.665
Group			
Woman with breast cancer (ref*)	0		
Significant other	-13.80	(-15.83 to -11.77)	<0.001**
Model 3			
Persons HADS_D	-3.40	(-4.17 to -2.64)	<0.001**
Partners HADS_D	0.03	(-0.74 to 0.79)	0.945
Group			
Woman with breast cancer (ref*)	0		
Significant other	-16.0	(-18.5 to -13.45)	<0.001**
Persons HADS_D * persons group	2.31	(0.80 to 3.82)	0.003**
Partners HADS_D * partners group	-0.67	(-2.18 to 0.84)	0.382

Table 5.23 shows the Modelling for variables pertinent to Affective States using the Actor-Partner Interdependence Model with quality of life as the dependent variable, dyad (n=114)
ref*=reference. **=variables that show significant correlation with quality of life (p≤0.05).

Following the above modelling using the actor partner interdependence model in terms of quality of life, the variables which were significant were (1) the group, (2) model of other (3) the persons' need for support (4) the anxiety level of the person themselves and (5) the depressive symptoms of the person themselves. These were incorporated into a further Model to test for interactions (Table 5.24).This Model has two aspects to it Model A and Model B.

Table 5.24 Modelling in Actor-Partner Interdependence Model (A and B Model)

Model of Other **Model A**	**Regression coefficient β**	**(95% CI)**	***p*-value**
Persons Model of Other	0.07	(-0.25 to 0.39)	0.666
Model B			
Persons Group * Model of Other	-0.08	(-0.53 to 0.37)	0.723
Woman with breast cancer (ref*)	0		
Significant other	0.27	(-0.37 to 0.90)	0.412
Need for Support **Model A**	**Regression coefficient β**	**(95% CI)**	***p*-value**
Persons Need for Support	-0.33	(-0.96 to 0.29)	0.297
Model B			
Persons Group * Need for Support	-0.67	(-1.67 to 0.33)	0.187
Woman with breast cancer (ref*)	0		
Significant other	0.47	(-0.81 to 1.75)	0.473
Support Seeking Behaviour **Model A**	**Regression coefficient β**	**(95% CI)**	***p*-value**
Persons Support Seeking	-0.38	(-0.88 to 0.13)	0.143
Model B			
Persons Group * Support Seeking	-0.18	(-0.90 to 0.54)	0.625
Woman with breast cancer (ref*)	0		
Significant other	-0.24	(-1.26 to 0.77)	0.640
Group **Model A**	**Regression coefficient β**	**(95% CI)**	***p*-value**
Persons Group	-14.00	(-15.87 to -12.12)	<0.001**
Model B			
Persons Group*Group			
Woman with breast cancer (ref*)	0	0	0
Significant other	-18.09	(-37.32 to 1.15)	0.065
Anxiety **Model A**	**Regression coefficient β**	**(95% CI)**	***p*-value**
Persons HADS_A	-1.39	(-1.99 to -0.78)	<0.001**
Model B			
Persons HADS_A	-1.77	(-2.55 to -0.99)	<0.001
Persons Group			
Woman with breast cancer (ref*)	0		
Significant other	1.15	(-0.11 to 2.40)	0.73
Depressive Symptoms **Model A**	**Regression coefficient β**	**(95% CI)**	***p*-value**
Persons HADS_D	-1.49	(-2.36 to -0.63)	<0.001**
Model B			
Persons HADS_D	-1.52	(-2.62 to -0.42)	0.007**
Persons Group			
Woman with breast cancer (ref*)	0		
Significant other * person HADS_D	0.75	-1.07 to 2.57	0.418

Table 5.24 shows the Modelling for variables that were statistically significant in the first model. This model was run again with any variable showing significance (p<0.25), Dyad (n=114). Model A: Refers to persons own variable value, Model B: refers to that variable of the person when Group is also a variable. ref*=reference. **=variables that show significant correlation with quality of life (*p*≤0.05).

Following on from the above Model, the final Model C (Table 5.25) shows the significant correlations between the variables in the model and QOL. From the final model, the persons own anxiety level (p<0.001) was negatively associated with QOL, the persons own depressive symptoms (p<0.001) was also negatively associated with QOL as well as the group to which the person belongs (<0.001), were all statistically significant (Table 5.25) to a level of p≤0.05. The results showed that anxiety and depressive symptoms were both negatively associated with QOL for both women with breast cancer and their significant other. As well as this, the group the person belonged to i.e. whether the woman with breast cancer or her significant other also influenced QOL scores. The researcher looked at Table 5.25 with interaction effects included but the interaction effects failed to reach statistical significance and hence these results are reported here.

Table 5.25 Modelling in Actor-Partner Interdependence Model (Final Model C)

Model C Persons Group and Partners Group with HADS_A and HADS_D	**Regression coefficient β**	**(95% CI)**	***p*-value**
Persons Anxiety (HADS_A)	-1.39	(-1.99 to -0.78)	<0.001**
Person Depressive Symptoms (HADS_D)	-1.50	(-2.62 to -0.42)	<0.001**
Group			
Woman with breast cancer (ref*)	0		
Significant other	-14.16	(-16.04 to -12.28)	<0.001**

Table 5.25 shows the Modelling for HADS_A, HADS_D and Group that were statistically significant in Model A and Model B. Statistical significance for anxiety, depressive symptoms and group that the person belongs to i.e. whether significant other or woman with breast cancer was shown high with p values <0.001 for all variables in Model C.
ref*=reference. **=variables that show significant correlation with quality of life ($p \leq 0.05$).

Due to anxiety and depressive symptoms as appearing to be extremely correlated with QOL in this study, the researcher noted that running the model looking at anxiety as a dependent variable and then running a separate model analysis with depressive symptoms as a dependent variable may provide interesting results. Thus, the model was run again with anxiety as the dependent variable and then with depressive symptoms as the dependent variable with the other independent variables. Results of this are outside the parameter of reporting for this thesis but are included in the Appendices (Appendix 27 and 28).

The results of the study led to the further development of the framework (Figure 6.1). This framework depicts the original framework by Pietromonaco et al., (2013) which was adapted throughout the thesis. Framework 6.1 shows the key factors associated with QOL for the woman, represented on the right side and the key variables associated with QOL for the significant other, located on the left side. Figure 6.1 demonstrates the hypothesis of the study and how these were tested. As seen in the framework the main variables associated with QOL were affective states, which in this study were categorised as anxiety and depressive symptoms. Socio-demographics which were associated with QOL were phase of treatment, employment, relationship of significant other, age and education. These are further discussed in the next chapter.

Figure 6.1 Framework: Attachment Figure for Breast Cancer Context III

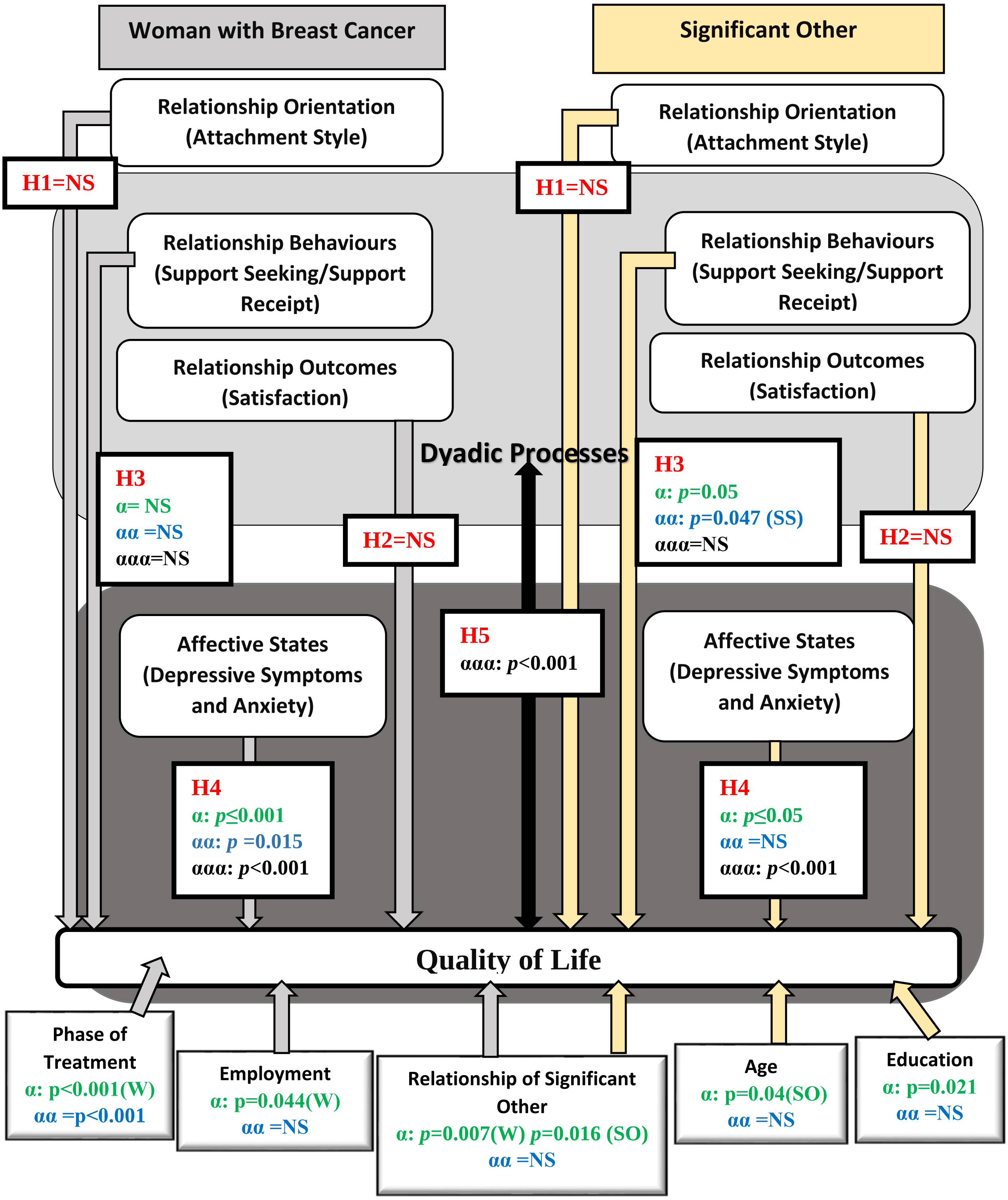


Figure 6.1 Depicts the framework that was adapted following the results of the study.
H denotes which of the hypothesis are being tested (H1-H4).
Woman with Breast Cancer (W) ⇨
Significant Other (SO) ⇨
NS= not significant *p* value
α=Univariate analysis, αα= Multivariate analysis, ααα= Modelling. SS=Support Seeking behaviours.

Summary

This chapter has provided a detailed account of the results of a study which investigated the influence of attachment styles on the health outcomes of women with breast cancer and their self-identified significant other. The analysis of the results included descriptive statistics as well as inferential. From the descriptive statistics it was observed that most women in the study were middle aged, married, living with their spouse and working. Furthermore, most women identified their spouse as their significant other. For significant others most were male, in the 55-65 year age category, married, living with their spouse and working.

Univariate analysis concluded that for women with breast cancer, the phase of treatment, employment status, relationship of the significant other, anxiety level and depressive symptoms were all correlated with quality of life in terms of FACT-GP scale. Regarding FACT-B scores, quality of life was found to be associated with all of the above variables as well as support seeking behaviours. Women with breast cancer who were in the pre-treatment group had lower quality of life scores than those who were in treatment. Additionally, lower QOL scores were identified in women with breast cancer who indicated that they were presently not working for payment (including those working in the family home, retired, student, unable to work due to illness and looking for employment) than women who were employed. Women with breast cancer who indicated someone other than their spouse as being their significant other and who had higher anxiety and depressive symptoms also had lower QOL scores. Support seeking behaviours were found to be negatively associated with quality of life. With regard to significant others, QOL was associated with age, educational level, relationship of the woman with breast cancer, anxiety and depressive symptoms. Significant others in the 35-44 year age bracket and educated to primary or secondary level, who indicated the woman with breast cancer as their spouse and who had lower scores on anxiety and depressive symptoms, had higher QOL scores on FACT-GP scales.

Multivariate analysis demonstrated that quality of life (FACT-GP) for women with breast cancer was associated with phase of treatment and anxiety, as well as age, employment status, actual received support, anxiety and depressive symptoms. Women with breast cancer who were pre-treatment had a lower quality of life. Women with breast cancer indicating higher incidences of anxiety and/or depressive symptoms had lower quality of life scores. Women with breast cancer who were younger, unemployed and indicated poorer actual received support also had a lower quality of life. Regarding significant others, multivariate analysis demonstrated that quality of life was associated with support seeking/receipt behaviours. Significant others who scored higher on the support seeking behaviours scale scored lower in terms of QOL (FACT-GP).

Table 5.26 Key Findings

Key Findings of the Study

- **Quality of Life was lower** for **significant others than** for **women with breast cancer**
- **Anxiety and depressive symptoms were negatively associated with quality of life for both the woman with breast cancer and her significant other**
- **The phase of treatment of the woman with breast cancer i.e. whether pre-treatment or involved in treatment is associated with quality of life**
- **The group that the person within the dyad belongs to i.e. whether significant other or woman with breast is associated with quality of life**

Data pertaining to the dyads was analysed using a modelling approach. The main findings of the modelling analysis centre on anxiety, depressive symptoms and the group to which the person belongs i.e. whether the woman with breast cancer group or partner group, all of which influenced quality of life ($p<0.001$). Anxiety and depressive symptoms were inversely correlated with QOL, and the significant others of women with breast cancer indicated poorer QOL than women with breast cancer themselves. The key findings of the study are depicted in Table 5.26. Findings in the context of relevant literature will be discussed within chapter 6.

Chapter VI Discussion

Introduction

This chapter presents a critical discussion of the findings of the research study which examined the influence of relationship orientation (attachment style), dyadic processes (relationship behaviours, relationship outcomes) and affective states (anxiety and depressive symptoms) on health outcomes (quality of life) for women with breast cancer (n=147) and their identified significant other (n=127). Data were analysed both individually (the woman with breast cancer and then the significant other) and as a dyad (n=114 couples). The study used the principles of attachment theory (Bowlby, 1969) and was underpinned by a framework devised by Pietromonaco et al., (2013) (Appendix 4 and 12). The results of the study and their implications for nursing education, practice and future research on women with breast cancer and their significant other are also presented. The chapter is structured using the key components of Pietromonaco’s et al., (2013) framework.

6.1 Sample Profile

Most of the women with breast cancer in the study were married, identified their spouse as their significant other, and were employed and Irish. The age profile of the women with breast cancer ranged from 25 to 65+ years, with the majority between the ages of 55-64 years (33.3%). The sample of women with breast cancer in this study was representative of national statistics in terms of breast cancer (NCRI, 2016), indicating that most breast cancer diagnoses occur in women over 50 and in low to middle income socio economic groups (NCRI, 2016).

Almost two-thirds of the significant others nominated were males (n=105, 82.7%) and spouses between the ages of 55-64 years (n=42, 33.1%). Research on significant others has also identified spouses as the most prominent significant other identified by women with breast cancer (Ben-Zur et al., 2001; Coristine et al., 2003; Lethborg et al., 2003; Nikoletti et al., 2003; Feldman et al., 2005; Luszczynska et al., 2007; Fletcher et al., 2010), although other forms of significant others also exist including parents, siblings (Nikoletti et al., 2003), relatives (Pinkert et al., 2013) and children (Kim et al., 2007).

6.2 Socio-Demographics and Quality of Life

Socio-demographics consisted of age, gender (for significant others only), ethnicity, religion, marital status, relationship of significant other, education level, employment status, and phase of treatment (for woman with breast cancer only). As QOL was the dependent variable in the study the socio-demographic variables found to be associated with QOL are discussed in detail below.

Age and Quality of Life

In the current study, the majority of women were over 50 years of age. In the pre-treatment group (n=81), between the ages of 45-54. In this study, older aged women with breast cancer (65+ years) had higher quality of life scores than those in younger age categories. Similar studies within the breast cancer context assessing age and quality of life have found that women in older age groups tend to rate their QOL as better than younger women (King et al., 2000; Parker et al., 2003; Sammarco, 2009).

Similarly to this present study Avis et al., (2005) highlighted younger women (<50 years) with breast cancer as being at a greater risk for lower QOL. Previously, Wenzel et al., (1999) using the Functional Assessment of Cancer Therapy-Breast instrument, also identified QOL as being significantly lower for younger women (<50 years) with breast cancer (*p*=0.021), specifically with regard to emotional wellbeing and breast carcinoma specific concerns when compared with older women (>50 years). Northouse et al., (2002a) suggest a rationale for this could be that generally women with breast cancer who are younger have more concerns about recurrence of the cancer, and may have young children and be concerned with the effect on family life, career progression and survival. Women with breast cancer have acknowledged the added burden of dealing with breast cancer, particularly when young children are involved (Beaver et al., 2016).

Significant others were mainly categorised as being between the ages of 55-64 years. Higher QOL was evident in significant others who were in the younger age category of 35-44 years. Positive associations with QOL and lower age suggest that significant others who have a greater level of functional ability rate their QOL as higher due to feeling less burdened in providing care to the woman with breast cancer. However, significant others who are younger may also have busy work schedules, family obligations and impairments that can impact on their QOL. Hence, while this study supported younger age being positively correlated with QOL, breast cancer has a profound effect on the significant others' across all age groups.

Group and Quality of Life

Interestingly, significant others were found to have lower QOL than women with breast cancer. This contrasts with existing research, where women with breast cancer are predominantly associated with having lower QOL scores (Northouse et al., 2002a; Smider, 2010; Salonen et al., 2014). In the current study, significant others scored lower on all subscales of QOL, but in particular on the subscale relating to social and family wellbeing (SFWB). This result confirms Northouse et al's., (2002a) view that significant others have to take on a lot when adjusting to a breast cancer diagnosis. Additionally, the social and family wellbeing of loved ones, in particular significant others, who support the woman at this time can be impacted on profoundly.

Similar to the current study, previous research has identified that it is not solely the woman who has to cope with the breast cancer but also her significant other who experiences feelings of sadness, loss, fear and worry (Arman et al., 2002; Hagerty-Lingler et al., 2008). Additionally, the psychological effect that a breast cancer diagnosis has on the significant other, the increased financial burden, healthcare costs, stress, strain and disruption to daily life, further impact on the QOL of significant others (Sjovall et al., 2009). However, significant others may see the focus as "being on the woman" and "helping her get better" as stated by two significant others in the current study, without realising that they themselves may be in need of support. Whilst some studies have identified that significant others of women with breast cancer may be at risk due to the breast cancer diagnosis of their partner/loved one, limited research is available to determine reasons for lower QOL scores in this group or to suggest possible support structures that may be utilised by significant others.

Alterations in QOL for significant others have been attributed to life changes due to a breast cancer diagnosis (Awadalla et al., 2007). The current study's findings are in line with studies that have been conducted in Hong Kong (Chan and Chang, 1999), Turkey (Turkoglu and Kilic, 2012) and China (Zhu et al., 2014) demonstrating that significant others can be at a profound risk of lower QOL, due to being involved in the care of a woman with breast cancer. Findings from the current correlational study support previous literature identifying that significant others living with women with breast cancer are vulnerable, particularly at the time of diagnosis, and are at risk of lower QOL due to being involved in the woman's care (Ben-Zur et al., 2001; Hagerty-Lingler et al., 2008).

Phase of Treatment and Quality of Life

This study consisted of two groups in terms of phase of treatment, women who were pre-treatment and women who were currently in treatment. Phase of treatment was identified as being significantly associated with QOL for women with breast cancer, with women in the pre-treatment group more likely to report poorer QOL. Kissane et al., (1998) collaborates with these findings, highlighting that women immediately post diagnosis or in the early stages of treatment as being at a greater risk of poorer QOL than those at a later stage of treatment. This may be linked to the stressful and difficult time associated with diagnosis and the degree of uncertainty and worry that is associated with it (Caplan et al., 2014).

Women with breast cancer, particularly at the diagnosis stage can be extremely vulnerable and are dealing with a lot of new information as well as a life altering diagnoses (Northouse et al., 2002a). The initial shock and trauma that can be experienced at the diagnosis phase often makes information digression and retaining difficult (Beaver et al., 2007). The time around diagnosis often tends to be the most challenging due to the amount of new information and the degree of distress the diagnosis can cause (Vahdaninia et al., 2010). A diagnosis of breast cancer is life altering and usually within the first few weeks treatments regimes and surgery options are commenced (Vahdininia et al., 2010). Dealing with new symptoms resulting from treatments of chemotherapy (Beaver et al., 2016), radiotherapy (Schnur, Ouellette, Bovbjerg and Montgomery, 2009) as well as possible surgeries have been identified as posing huge psychological challenges for women with breast cancer (Sherman et al., 2009). The life-threatening nature of breast cancer, along with the side effects of treatment, place great strain on patients and their families (Wagner, Bigatti and Storniolo, 2006). This time can be overwhelming for the woman who is also attempting to adjust to the diagnosis (Belcher et al., 2011). The added burden of telling loved ones as well as alteration to daily life including time taken off work all contribute to the time around diagnosis as being extremely difficult (Feldman et al., 2005).

Contrary to this, Parker et al., (2003) suggest that individuals with cancer (n=351) who are more advanced in the disease progression have poorer QOL due to the impacts of treatments and the strain of the cancer progression. Additionally, some researchers claim an initial increase in distress after diagnosis that can persist during the treatment phase and often remains present throughout even survivorship years (Epping-Jordan et al., 1999; Pauwels et al., 2012; Hsiao et al., 2014). Longitudinal studies have noted that distress, anxiety and depressive symptoms can remain present for months following treatment completion, although over time, levels of these psychological ailments tend to decrease generally (Vahdaninia et al., 2010; Chou et al., 2012; Cheng et al., 2012; Yan et al., 2016).

Zahlis and Lewis (2010) US study depicts the challenges that can be faced by spouses (n=48) of women with breast cancer around diagnosis time and the intricate effect the diagnosis has on spouses. Spouses stated feelings of being “nailed by the cancer”, “the cancer changing them” and “the need to make things work” (Zahlis and Lewis, 2010). Hence, while the literature on breast cancer suggests differing results in relation to whether time of diagnosis is the most difficult or not, studies in this context corroborate that it is a challenging time (Zahlis and Lewis, 2010; Belcher et al., 2011). The above statements are reflective of those in the open comments section for the current study, identifying the time of diagnosis as both challenging and distressing for both the woman with breast cancer and her significant other.

Relationship of Significant Other and Quality of Life

Similarly, other studies in this context have indicated spousal relationship as the most common significant other relationship that women with breast cancer identify (Northouse et al., 1998; Ben-Zur et al., 2001; Grunfeld et al., 2004; Luszczynska et al., 2007; Smider, 2010; Zahlis and Lewis, 2010). Women and significant others who indicated “spouse” as their significant other had higher QOL scores than those who indicated non-spousal significant others. These results support the positive impact that intimate relationships can have on QOL not solely for the woman with breast cancer but also her significant other.

Having a significant other who is also the spouse may be attributed to greater QOL as the availability of support can be more consistent (Dorval, Maunsell, Deschenes, Brisson and Masse, 1998). Hagerty-Lingler et al., (2008) suggest that being involved in an intimate relationship with someone who is also the main significant other through the breast cancer trajectory can enhance outcomes for women with breast cancer. Spouses are in the optimum position to provide support and be actively involved in the decision making process. In contrast, Mayer and Grober (2006) found that the type of relationship i.e. whether spousal or non-spousal was not significant, but having a significant other involved in care influenced health outcomes for women with breast cancer. Mayer and Grober (2006) demonstrated that siblings were identified as the main sources of support (85%) in comparison to spouses (82%). Thus, it is evident that while significant others may vary in type (i.e. spouse, sibling, parent, and child), a spouse generally tends to be the most frequently identified significant other and these individuals have a significant impact on the QOL of the woman with breast cancer.

Employment Status and Quality of Life

The majority of women with breast cancer and their significant other were employed. Individuals who indicated that they were employed had a higher quality of life than those who were categorised as “not working for payment”. For women in a breast cancer context, work can act as a distraction (Hagerty-Lingler et al., 2008). Women who stated that they had a functioning role in their job, reported higher levels of self-worth and also stated that they could use work colleagues as a source of support (Hagerty-Lingler et al., 2008). The current study indicates that being employed can result in better QOL overall. Timperi et al., (2013) in a prospective cohort study of women with invasive breast cancer (n=2,013) describes the associations between hours worked per week and change in employment with quality of life (QOL) from diagnosis through active treatment. Utilising the same quality of life instrument (FACT) as the current study, Timperi et al., (2013) found that continuing to work after a breast cancer diagnosis may be beneficial to multiple areas of QOL. At baseline, overall wellbeing was higher for women who worked at least some hours per week compared to women who were not working. There was a significant, positive association between hours worked per week and physical and social wellbeing. At the six-month follow-up, women working at least 20 hours per week had higher physical and functional wellbeing than those not working. Lower scores for physical and functional wellbeing were observed among women who stopped working during the six-month follow-up period.

Strategies to help women continue working through treatment should be explored. This can be seen to be linked to workplace initiatives such as the Macmillan back to work initiative (Macmillan, 2014) as well as being reflected in the Working with Cancer: Supporting employees living with cancer to return to work (Union for International Cancer Control (UICC), 2014). In conjunction with UICC, BUPA have produced the guide, Tackling Breast cancer in the Workplace - a win for everyone, to support employers to set up a breast cancer initiative as part of their wider employee health programmes (BUPA, 2014). While these represent significant advancements in breast cancer, further initiatives are warranted to enhance women with breast acncer returning to work, particularly within the Irish setting.

Educational Status and Quality of Life

Individuals with primary level education indicated the highest QOL. A greater QOL was associated with individuals who had attained either primary or secondary level. The results of this study were surprising as studies on education and QOL have previously determined that individuals with a higher level of education tend to have better QOL. Ross and Van Willigen (1997) examined the influence of education on QOL generally in terms of a representative national sample of both males and females. Results concluded that individuals who are educated (to a formal level) have lower levels of distress, largely due to the ability to work in higher paid jobs. Parker et al., (2003) support Ross and Van Willigen (1997) in their later study indicating that better education is a contributing socio-demographic factor within a cancer context. Although in the current study, education was only observed as influencing QOL for significant others, the findings support existing research that have investigated education as a socio-demographic factor influencing QOL. Thus, as education level increases, QOL also improves due to improvements in job perspectives and economic resources.

In summary, the findings regarding socio-demographics and QOL have been discussed in this section. The next section discusses the findings of the study in relation to the dependent variable that was being investigated i.e. QOL.

6.3 Quality of Life and Influencing Factors

The definition of quality of life (QOL) for this study was guided by the empirical and theoretical literature. QOL was defined as encompassing the physical, emotional, functional and social wellbeing of the individual (Nussbaum and Sen, 1993; Revicki et al., 2000). Several factors were identified as influencing QOL. These factors can be divided into factors for: (I) the woman with breast cancer, (II) the significant other and (III) the dyad.

Studies on QOL in a breast cancer context, found QOL scores for women to be lower when compared with age adjusted general populations (Hagerty-Lingler et al., 2008; Warren et al., 2010; Tehrani et al., 2011). Schou and colleagues (2005) found QOL for women with breast cancer (n=949) to be significantly lower on emotional, cognitive, and social functioning ($p < 0.01$), particularly at the time of diagnosis when compared with women from a general population. Although QOL was good for both women with breast cancer and their significant other, breast cancer has been shown to have a significant impact on QOL (Northouse et al., 2002b). This supports the qualitative findings of the current study which identifies some of the challenges around a breast cancer diagnosis and the impact it has on QOL (Appendix 24).

6.3.1 Relationship Orientation

Relationship orientation for this study had 2 components attachment style and Model of Self/Model of Other.

Attachment Style

Woman with Breast Cancer and Significant Other

Interestingly, QOL for the woman with breast cancer was not associated with attachment style. Similarly, over half of significant others indicated secure as their attachment style. Secure attachment style has been shown to be linked with better relationship outcomes (Fagundes et al., 2014), however, in this study no correlation was observed for either the woman or her significant other. Thus, regardless of the attachment style, QOL was not affected. Previous studies assessing attachment style have correlated it with health outcomes and QOL (Korziinska, 2012; Gauthier et al., 2012; Hsiao et al., 2014), yet this study did not support these findings. Possible rationales for this may be attributed to the instrument utilised as well as the sample restrictions. Whilst the RQ questionnaire has been validated and widely utilised to ascertain information pertaining to attachment style, its complexity and restriction to 4 attachment styles may have resulted in inappropriateness to this sample. Use of the Adult Attachment Interview may have provided more in depth insights into attachment styles.

Korziinska (2012) illustrated that secure attachment styles can be indicative of better QOL scores in women with breast cancer and improve functioning. This was supported by Hsiao et al., (2014) within a similar breast cancer context who found spouses (n=34) QOL to be significantly influenced by their wives' attachment style particularly when their attachment style was insecure (fearful, dismissive, preoccupied). Gauthier et al., (2012) also reported the negative associations between insecure attachment styles and health outcomes within a chronic pain context. Additionally, Fagundes et al., (2014) suggested that a better understanding of attachment style and its influences on QOL for women with breast cancer (n=96) is necessary to improve outcomes and identify individuals at risk. While the four types of attachment style were evident in the current study, a clear definitive correlation was not observed.

Dyad

Interestingly, in the current study attachment style was not found to be correlated with QOL for either the woman with breast cancer or her significant other as a dyad. This is surprising given that previous studies have used attachment style as a predictor for support and health outcomes (Ainsworth, 1978; Bartholomew et al., 1991; Crittenden, 1992; Feeney, 2000; Milyavskava et al., 2012). Additionally, it is argued that health status and outcomes can be intrinsically linked to the quality of personal relationships and attachment styles (Feeney, 2000; Gur-Yaish et al., 2014).

Other studies that examined attachment security in a cancer context, found that health-related factors were significantly associated with the presence of depressive symptoms and distress, and that the latter were inversely related to the degree of attachment anxiety and avoidance within the relationship dyad (Hunter et al., 2006; Rodin et al., 2007). Fagundes et al., (2014) using the Experiences in Close Relationships Scale within an American context, noted that breast cancer survivors (n= 96) with more attachment anxiety reported poorer QOL than those with less attachment anxiety. Women who were more avoidantly attached also reported poorer QOL compared with those who had less avoidant attachment styles ($b = -0.77$, $t = -3.19$, $p = 0.002$) (Fagundes et al., 2014).

Thus, in comparing the current study with existing research, the assumption that attachment style is an influencing factor for QOL for women with breast cancer and their significant other was not supported. This may be due to the use of a different instrument (such as the Adult Attachment Interview versus the Relationship Questionnaire) to assess attachment style or may be reflective of differing cultural contexts, although both studies were cross sectional in design (Fagundes et al., 2014). Many of the studies conducted on attachment theory in this context are based in America, thus cultural norms with regard to the Irish setting and preferences in relation to relationships may have influenced the results of this current study.

Model of Self/Model of Other

Regarding this study, Model of Self (i.e. level of anxiety) and Model of Other (i.e. level of avoidance) were found to be low in terms of both women with breast cancer and her significant other. Conversely, in other studies within a cancer context, women with breast cancer have been identified as reporting high levels of attachment avoidance and anxiety (Tacon, Caldera and Bell, 2001). Assessing women with breast cancer (n=52) and women in a control group (non-cancer) (n=52), between the ages of 35-55 years with the Adult Attachment Questionnaire, Tacon et al., (2001) found that women with cancer (M=32.71, SD= 9.9) reported significantly greater incidences of attachment avoidance than those without cancer (M=27.00, SD=9.34) (F (1,102) =9.15, p<0.01). The disparity between existing research and this present study may be explained given the fact that both individuals were asked to rate their level of avoidance and anxiety and may have been reluctant to indicate a poor relationship style with their significant other who was also partaking in the study. Another explanation for better scores on the Model of Self/Model of Other in the current study may be that for the purpose of the study the women identified someone with whom they had a good and positive relationship as their significant other. Hence, levels of anxiety and avoidance as depicted by Model of Self and Model of Other scores were low in both women with breast and their significant others and were not associated with QOL.

6.3.2 Relationship Behaviour

Support Seeking/ Support Receipt

Support has been identified as being a critical component in determining how well women with breast cancer cope with their diagnosis and treatment (Forrest et al., 2006; Dumrongpanapakorn and Liamputtong, 2014; Fernandes et al., 2014). Within this study, overall scores for support behaviours were high, indicating good support behaviours for women with breast cancer and their significant others. Support for the purpose of this study was categorised into three headings that were derived from the subscales which were used from the BSSS (Schulz and Schwarzer, 2003b): (I) support seeking, (II) actual received/provided support and (III) need for support. Support seeking behaviours for women with breast cancer were found to be high indicating good support as was evident for significant others also. Actual received/provided support was found to be high in both women with breast cancer and significant others. This demonstrates that women with breast cancer indicated good actual support provided by their significant others and that significant others also rated the level of support they provided as good. Women with breast cancer scored high on the need for support subscale, indicating a high need for support. Significant others also scored high on the need for support subscales demonstrating that this group also has a high need for support.

Woman with Breast Cancer and Significant Other

In terms of significant others, key findings from the current study demonstrated that support seeking behaviours were negatively associated with QOL. Thus, the more support seeking behaviours a significant other indicated the lower their QOL. Poorer support seeking behaviours have been reported to significantly impact on the individual's health (Parker et al., 2002; Manne et al., 2004; Emery et al., 2009; Belcher et al., 2011). Previously, Sandgren et al., (2004), found that significant others who actively seek support or overestimate the needs of the woman with breast cancer had lower QOL scores. Earlier, Akechi et al., (1998) and Ganz et al., (2003) demonstrated the association between support and predictive factors of health for women with breast cancer. In a randomised clinical trial, utilising an interventional support group (n=134), Northouse et al., (2005) highlighted the key impact that support has on women with breast cancer and their caregivers. Dyads involved in the intervention indicated significantly greater support structures, better QOL scores, less hopelessness and reduced negative outcomes in comparison to those in the control group (no intervention, usual care).

Dyad

The results of this study in relation to support behaviours is in contrast to existing literature around support, where support has been identified as significantly impacting on health outcomes. Belcher et al., (2011) demonstrated in an American context how coping was intrinsically linked with better outcomes and maintaining intimacy within dyads. Similarly, Arora et al., (2007) indicated the negative impact that poor support can have on women with a breast cancer diagnosis. Less supportive significant others have been correlated with greater problem areas and higher incidences of stress (Sawin, 2010).

For significant others, QOL and support from the woman were also associated with each other in Ben-Zur et al's., (2001) study in Israel with women with breast cancer and their spouses (n=73), as was evident in the present study.

These differing results in terms of this current study and other literature on breast cancer and support, may be attributed to the fact that woman with breast cancer in the current study were asked to identify their significant other i.e. the person most involved in their care at this present time. In previous studies, the term significant other may not have been always clearly identified to them, thus women may have chosen significant others who provide a lot of support to them for this current study. Additionally, women and their significant others identified that they were satisfied with their relationship. This may have impacted on results as higher satisfaction rates with the quality of the relationship has previously been linked with greater levels of support (Wimberly et al., 2005; Manne et al., 2008).

Actual Received/Provided Support

Woman with Breast Cancer and Significant Other

Higher "actual received support" for women with breast cancer indicated better QOL outcomes. Recently, Yan et al., (2016), support this in their study where increased levels of support were associated with better QOL for women newly diagnosed with breast cancer (n=1,660). The study concluded that adequate actual provided support from family members and friends was correlated with better QOL for women coping with breast cancer. Emery et al.,'s (2009) supports the findings this current study linking slower declines in physical activity and greater QOL with greater provided support also.

Overall, significant others rated the support they provided as higher than that which the woman with breast cancer rated as being received. This disparity between support in terms of what the woman reports as receiving and what the significant other reports as providing has been highlighted in previous literature (Belcher et al., 2011), where women with breast cancer were not always content with the support provided by their significant others. In addition to this, Hagerty-Lingler et al., (2008) found that spouses of women with breast cancer often do not anticipate their own need for support Spouses stated it was a challenge at times to balance being involved in the woman's care. The ability to provide support whilst also allowing the woman to express her desires and preferences was also a concern. Significant others may also be at risk of overestimating the needs of the woman. This may present further rationale for the discrepancies between received and provided support, within the current study.

Dyad

In the current study the actor-partner interdependence modelling demonstrated that Actual Provided/Received Support was not correlated with QOL. Discrepancies between this present study's findings and previous research may be attributed to the woman with breast cancer identifying significant others whom they felt close to and with whom they had positive relationships thus, indicating individuals who provided good support. This is a common issue in dyad studies where the woman with breast cancer self identifies their significant other as opposed to the individual being selected by the researcher. However, in order to ensure that the person most involved in the woman's care is included in the study, allowing the woman to self-identify the significant other was necessary.

Need for Support

Women with breast cancer have been identified within the literature as needing support throughout the cancer trajectory for a variety of reasons (Hagerty-Lingler et al., 2008; Levy et al., 2011). Significant others have also expressed desires for support to be provided either from their partner or from their wider social networks including family and friends. Support aids in the adjustment process, treatment regimens and development of coping strategies (Ben-Zur et al., 2001; Feldman et al., 2005; Budin et al., 2008).

Woman with Breast Cancer and Significant Other

Although other studies have demonstrated the need for support to be provided when dealing with a cancer diagnosis. The need for support within the breast cancer context is well established and research focusing on support groups and self-help groups acknowledge the important role that support plays in coping with breast cancer (Belcher et al., 2011), Findings from the current study may be due to the women with breast cancer being mainly pre-treatment and about to undergo surgery, thus perhaps their need for support was low at this time. However, while no correlation with QOL was found among women in the in treatment group they did demonstrate lower scores on the “Need for Support Subscale” when compared with women in the pre-treatment phase. This is interesting as generally women going through treatment would be perceived as requiring greater support than those about to start treatment (Belcher et al., 2011).

The need for support was not found to be correlated with QOL for significant others either. Although other studies have demonstrated that significant others experience a strong need for support (Coristine et al., 2003; Emery et al., 2009), this study demonstrated that supportive behaviours among significant others were quite positive and were not associated with QOL. Previous research has found the need for support in women with breast cancer to be high and that significant others often play a vital role in meeting the support needs of the woman (Fletcher et al., 2012). The need for support may be attributed to emotional, psychological, physical, financial and social needs factors, including phase of treatment, symptoms and effect on daily life.

Often at times the woman can experience feelings of a loss of womanhood as a result of surgery or treatment, hair loss, mastectomies and swelling of the axilla or arms which can have huge impacts on physical appearances, combined with added stress and financial burden. In the present study, the most prominent cancer specific concerns which were identified on the subscale of the FACT-B focusing on additional concerns, related to the ability to feel like a woman and concern that other members of their family may be at risk. Thus, woman's need for support in dealing with these additional concerns is also illustrated. Significant others also need support to help cope with a breast cancer diagnosis. The need for support for significant others can be attributed to elevated risks of anxiety and depressive symptoms (Belcher et al., 2011), feelings of being changed by the diagnosis (Zahlis and Lewis, 2010) as well as dealing with the emotional and physical aspects of the cancer (Levy et al., 2011). Thus, the need for support in this study was not correlated with QOL for either the woman with breast cancer or significant others although within the breast cancer context the need for support is evident.

Dyad

Support tends to be quite a broad subject and whilst the model for the dyad did not demonstrate any significant correlation with QOL, other researchers including Hasson-Ohayon et al., (2010) and Belcher et al., (2011) have linked the need for support with better health outcomes as well as relationship quality with dyad samples in a breast cancer context. Similarly, Luszczynska et al., (2007) also linked support in a dyad context with outcomes for both individuals in a breast cancer context. While the need for support within breast cancer is not a new phenomenon and perhaps has been one of the established important influencing factors on health outcomes in particular QOL (Badr, 2004), the need for support in terms of the dyad is relatively new. However, this current study's findings were not suggestive of an association between need for support and QOL for the individual. Reasons for this may be that a larger multi item tool is required to assess need for support. As support can be needed for a multitude of reasons, it follows that an accurate measurement of this concept also needs to be quite extensive and broad.

6.3.3 Relationship Outcomes

Relationship Satisfaction

Woman with Breast Cancer and Significant Other

In the current study, the majority of women and significant others indicated that they were satisfied with their relationship. Although no significant association was identified between relationship satisfaction and QOL within this study, the importance of being satisfied with a relationship has been supported by previous works (Wimberly et al., 2005; Manne et al., 2008). In the breast cancer context, relationship satisfaction or the level of contentment with the relationship have been linked with better health outcomes (Manne et al., 2004; Belcher et al., 2011). Higher incidences of relationship satisfaction have been associated with better adjustment levels, lower levels of psychological distress, greater levels of positive reappraisal and increased quality of life (Hagedoorn et al., 2000; Manne et al., 2009).

Dyad

Wimberly et al., (2005) identified the importance of relationship satisfaction for women with breast cancer and their significant others. Women with breast cancer stated that relationship satisfaction was a contributing factor to their overall wellbeing (Wimberly et al., 2005) and confirmed the importance of being happy within the relationship. While no clear correlation was observed between QOL and relationship satisfaction in the current study, previous literature on relationships and satisfaction have demonstrated the importance of individuals being satisfied with their relationship, partuclarly within dyadic relationships (Chou et al., 2012). Individuals who are satisfied with their relationship will strive to maintain it. This is particularly relevant if that relationship is acting as a support structure and proving essential care, as is often the case within the breast cancer context. Rationales for differing results in the present study compared to existing research may be attributed to the woman with breast cancer nominating a significant other with whom there was a positive relationship and as a result relationship satisfaction was high.

6.3.4 Affective States

Anxiety

Woman with Breast Cancer and Significant Other

In the current study, overall scores for anxiety for both women with breast cancer and significant others were low. In contrast to previous research on anxiety, where >40% of women (n= 222 women with early breast cancer: 170 (77%) of whom provided complete data up to five years after diagnosis or recurrence), indicated that they had experienced some form of anxiety at some stage throughout the disease (Burgess et al., 2005). The current study found that women with breast cancer and their significant others anxiety levels were lower than the previously defined parameters (of >11 being an indicator for concern). This study found that for both women with breast cancer and their significant others, who indicated higher levels of anxiety, poorer QOL scores were observed.

Anxiety has been found to be considerably high within the breast cancer context (Burgess et al., 2005), with almost half of women with breast cancer predicted to develop anxiety at some stage throughout their cancer trajectory (Burgess et al., 2005). Whilst anxiety levels for women with breast cancer were higher than their significant others as expected based on previous research, and the degree of stress the woman is undergoing, in the current study, both individuals demonstrated low levels of anxiety.

Higher levels of anxiety have previously been associated with poorer QOL (Cheng et al., 2012). Anxiety can give rise to a variety of symptoms including distress and psychological turmoil, hence QOL and functioning can be significantly impacted on by the presence of anxiety. Although anxiety tends to be high throughout the breast cancer trajectory, some researchers state that levels are often highest following diagnosis (Burgess et al., 2005; Chung et al., 2009). This is reflected in the current study that found that women in the pre-treatment group had higher anxiety levels than those in the in treatment group.

Bergelt et al., (2008) suggested that significant others are more susceptible to developing psychological ailments such as anxiety rather than physical ones. In collaboration with this, Sjovall et al., (2009) also identified the psychological impact that a breast cancer diagnosis has on the partners of women with breast cancer. The literature presents the rationale for significant others being more prone to psychological or affective ailments as being due to the worry, concern and burden they take on in aiding the woman with breast cancer (Bergelt et al., 2008; Sjovall et al., 2009). Whilst anxiety levels were low, an association between QOL scores and anxiety was observed.

Dyad

Greater anxiety symptoms were associated with reduced QOL scores for both individuals in the dyad. Previous studies on anxiety in a breast cancer context support the current study and have identified that anxiety presents a huge barrier to adjustment, coping and quality of life with potential for further health implications (Vahdaninia et al., 2010; Cheng et al., 2012). Anxiety has been highlighted as increasing the risk of psychological ailments and reducing the health of women with breast cancer (Burgess et al., 2005; Vahdaninia et al., 2010) as well as the significant other (Hinnen et al., 2007). Elevated levels of anxiety in women with breast cancer have previously been correlated with increased levels of anxiety in their partner/significant other and have been associated with decreased QOL scores in both.

Segrin et al., (2007) found that within a dyad sample (n=96 couples) the partners' anxiety influenced the anxiety of the women with breast cancer. Partners' anxiety was also associated with other indicators of the women's wellbeing including depression, fatigue, symptom management and perceptions of relationship quality. Other contexts have also demonstrated the impact that anxiety can have in terms of dyad relationships. This actor-partner effect and susceptibility to anxiety was collaborated by Chung et al., (2009), who confirms that QOL of patients and spouses (n=58) is significantly impacted on by the presence of affective states including anxiety (p<0.001) and depressive symptoms (p<0.001). This is a key finding in determining a cross-interdependence effect between the woman with breast cancer and her significant other. Women with breast cancer in the dyad who had higher levels of anxiety had poorer QOL scores, this was also evident for their significant others.

Depressive Symptoms

Woman with Breast Cancer and Significant Other

Depressive symptoms were found to be negatively correlated with QOL for both women with breast cancer and significant others (p<0.05). Research on depressive symptoms has suggested that most individuals going through a breast cancer diagnosis or their loved ones will experience some degree of depressive symptoms (NHS, 2012). It has been suggested that depressive symptoms, believed to affect between 15%-25% of women with breast cancer, significantly reduce quality of life (Coristine et al., 2003; Inoue et al., 2003; Sjovall et al., 2009; NCRI, 2014).

Braun, et al., (2007) reported more depressive symptoms in spouses of patients with gastrointestinal cancer or lung cancer identified (almost 40% of spouses) than patients themselves, in a range that was clinically significant. This could be due to significant others taking on the responsibilities that the woman with cancer can no longer fulfil including household duties, caring for children and financial duties as well as providing emotional support to the woman. While women with breast cancer have indicated the impact that the physical alterations have on them, significant others appear to be at a greater risk of developing psychological deteriorations including depressive symptoms. Similarly, Hasson-Ohayon et al., (2010) reported that significant others of women with breast cancer report greater levels of psychological distress (categorised as global depression and anxiety) than women with breast cancer themselves. Thus, significant others are a group that also need consideration when viewing the psychological impact of a breast cancer diagnosis (Hasson-Ohayon et al., 2010).

The varying results outlined above, may be attributed to the fact that the majority of the sample in the current study were women who were pre-treatment (n=81) and thus may not be experiencing depressive symptoms, due to the early phase of the cancer trajectory. However, women who were in treatment (n=66) indicated lower depressive symptoms than women in the pre-treatment stage, although there were seven outliers in the in treatment group scoring higher. The presence of these outliers perhaps highlights the individualistic nature of depressive symptoms. Longitudinal studies have found that depressive symptoms can remain present in the years following diagnosis and treatment. Depressive ailments can be seen at 3, 6 and 12 month follow ups and are argued to be evident in women who are also within the survivorship phase (Manne et al., 2005; Manne et al., 2008). This may present a rationale for the outliers in this present study. Although the range of scores for women with breast cancer was higher, a similar level of psychological ailments in terms of depressive symptoms was found in both women with breast cancer and their significant other.

Dyad

The dyadic modelling illustrated that individuals who had greater depressive symptoms had lower QOL. Dyadic studies have previously highlighted that significant others tend to be affected more psychologically rather than physically by a cancer diagnosis (Chung et al., 2009; Quinn et al., 2009). Significant others have been seen to be at risk for developing psychological ailments (Hinnen et al., 2007; Hsiao et al., 2014). These psychological ailments can impact on QOL and health outcomes. This current dyad study provides an insight into dyads and depressive symptoms and the significant negative effect they have on QOL as well as being supported by existing literature on cancer and dyads and depressive symptoms (Banthia et al., 2003). Chung et al., (2009) support the findings of the current study, showing that depressive symptoms exhibited actor-partner effects on patients ($p<0.001$) and spouses ($p<0.001$) QOL. Patients and spouses ($n=58$ dyads) with higher depressive symptoms had poorer QOL. Patients whose spouses had higher depressive symptoms were more likely to indicate their own QOL as poorer.

Anxiety and depression have strong associations with QOL domains in both women with cancer and significant others not only at an individual level but also within the dyad (Cross et al., 2000; Dastan et al., 2011; Cosat-Requena et al., 2013). Adequate attention to both anxiety and depressive symptoms is necessary when addressing the psychological, functional, emotional and social needs of both individuals in the dyad (Brown et al., 2010; Favez et al., 2016).

This study has presented interesting results with regard to socio-demographics, relationship orientation, dyadic processes and affective states which influence QOL not solely for the woman with breast cancer but also for her significant other. This study is also the first, to the researcher’s knowledge to utilise a psychology based theory to examine dyadic relationships within breast cancer, in an Irish cultural context. Cultural context is an important element to consider as cultural aspects can impact on relationships and how they operate.

In relation to policy and strategies within breast cancer care, promising strides are evident. This can be most notably seen in recent publications such as the National Cancer Strategy 2006, National Clinical Effectiveness Committee: Diagnosis, staging and treatment of patients with breast cancer (HSE, 2016) as well as the Strategy and Educational Framework for Nurses Caring for People with Cancer in Ireland (National Cancer Control Programme in partnership with the HSE Office of Nursing and Midwifery Director, 2012) all of which provide a positive progression in cancer care (HSE, 2016; HSE, 2015). However, further and stronger reference to signficant others and the dyad is needed at policy level within cancer care. This will be especially important as over the next decade there will be a major growth in incidence of cancer (including breast cancer) and demand for cancer services (27% projected increase in incidence from 2015 to 2025) (Warde et al., 2014). In addition, the move of cancer services to outpatient and day clinics will inevitably result in these significant others having a greater role in breast cancer care.

6.4 Appropriateness of Attachment Theory and Framework

In determining the applicability of a theory to a certain context, Fawcett (2005) outlines criteria for researchers to use as a method of evaluation. These criteria are; (1) is the theory fit for purpose, (2) is it operational, (3) performance of the theory, (4) relatability to hypothesis testing, (5) direction from research question, (6) addressing the research question both primary and secondary, (7) congruent with assumptions, (8) agreeable to outcomes, (9) availability of instrumentation and (10) association with the meta-paradigm concepts of nursing. The use of attachment theory for the current study will be discussed below using Fawcett’s (2005) criteria.

Purpose

The first component to consider is can the theory fit its purpose of this study i.e. is it measuring and providing explanations for the focus of the study (Fawcett et al., 2005). The field of psychology has considerably expanded within recent years and resulted in the development of vast and insightful theoretical underpinnings that explore close relationships. While several viable theories may have been utilized in the study of relationships following a robust literature review and serious considerations, attachment theory was determined as most applicable for the current study. The theory focuses on dyadic relationships and how a potential health threat may affect both dyadic and health processes within a particular dyad relationship. This is central to what was being assessed in this study on woman with breast cancer and their significant others' relationships in terms of the dyad and the breast cancer diagnosis. Attachment theory focuses on the relationship but also considers the influence of external factors such as behaviours and health on relational aspects.

Operational

Taking a theory from concept to operationalization can present problems, thus researchers are often encouraged to consider if the theory is readily operationalised or if not, whether this is feasibly achieved. The theory has to be fit for utility within the context. Attachment theory (with the aid of the Attachment framework developed by Pietromonaco et al., 2013) provided a foundation for the study although adaptation was required following review of the empirical literature and research methodology consideration. The original framework was influenced by previous research and was suggested as a future means of providing insightful knowledge pertaining to relationships and their contexts (Pietromonaco et al., 2013). Attachment theory explains the interpretation of the relationship processes and health with regard to the dyadic relationship. The framework by Pietromonaco et al., (2013) considers both positive and negative interactions in terms of the relationship.

Adapting a framework can present several issues and may result in the key concepts being omitted. In this case, the main key constructs that were identified both in attachment theory and in Pietromonaco et al‘s., (2013) framework remain evident in the final model (Figure 6.1). Pietromonaco et al., (2013) support the adaptation of the framework and suggest that many of the constructs that are proposed may differ depending on the context in which it is being used. The literature supported the elements which were included in the framework. The framework could have been utilised in its original format although quite extensive, however, Pietromonaco et al., (2013) refer to adapting a theoretical framework as providing a concrete evidence based platform that ensures the empirical literature has been both considered and included in the work.

Performance

The theoretical underpinnings of the theory which focus on relationships and how these influence health have been highlighted in existing research on relationships (pregnancy and birth, self-regulation and health behaviours, pain, older adults and caregiving, patients-practitioner relationships) as previously discussed in Chapter 2 and also within similar contexts relating to adult cancer and chronic illness (Manne et al., 2004; Manne et al., 2007; Rodin et al., 2007; Belcher et al., 2011). Components of relationship orientation, relationship behaviours, relationship outcomes, affective states and health outcomes that have been used in studies on relationships, are evident in the theory, although they are often presented as attachment style, support, satisfaction, anxiety and depressive symptoms and quality of life. The theory has previously performed well in the contexts which it has been used providing key insights into relationship aspects in dyad relationships in terms of health (Pietromonaco et al., 2013).

Hypothesis Testing

The theory relates to and addresses the main hypothesis of the study in its description and interpretation of relationships, dyadic processes and health processes for women with breast cancer and their significant other. It considers each of the constructs (i.e. relationship orientation, relationship behaviours, relationship outcomes, affective states and health outcomes) in terms of their relevance and association to each person (i.e. the woman with breast and the significant other as individuals), as well as depicting the complex processes that can occur within the dyad i.e. cross interdependence effect. The assumptions of the theory and the preliminary hypothesis of the study were congruent.

Direction from Research Question

While most theoretical frameworks develop from the research question this research question was guided and framed by Attachment Theory following the review of the theoretical and empirical literature. The theory was selected following a robust review of potentially applicable theories/models however, ultimately its specific design and core concepts were seen as central to this research study. The research question has the potential to further enhance breast cancer care and relationships within nursing practice while also determining a model of care that considers the psychological and relational aspects for this population. The theory was subsequently used to create the conceptual framework (Figure 4.1) which formulated the hypotheses and this was the basis for the study.

Addresses Primary and Secondary Research Question

The theory addresses the primary research question i.e. to examine the influence of attachment style, dyadic processes and affective states on health outcomes. The researcher also wanted to determine if attachment theory would provide a suitable framework for studying dyadic relationships within a breast cancer context.

Congruence of Assumptions

The assumptions of the theory were congruent with the research in that (a) there is a directional association depicted between relationship orientation, relationship behaviours, relationship outcomes, affective states and health outcomes, (b) dyadic relationships are inherently linked and interdependence can occur, (c) nurses should consider relational aspects in terms of health outcomes when providing care to women with breast cancer and their significant other within a breast cancer context. As nurses a holistic approach that incorporates relational components is essential in providing optimum care that is inclusive and supportive of significant others.

Agreement to Outcomes

The theory allows for both the woman with breast cancer and her significant others' experiences and indicators to be ascertained. The relationship between dyadic process and health as well as the influence of affective states on health outcomes is also considered within the theory which were crucial to the outcomes.

Instrumentation

The expansion in use of attachment theory has resulted in the development of a wide selection of instruments. The tools used in this study are all well validated and reliable instruments that provide key measurement of the constructs being investigated. Where the full scale was not used (i.e. The Berlin Social Support Scale, only 3 subscale utilised), subscales were included as described however these subscale all have established reliability.

Association to Nursing Meta-paradigm Concepts

The meta-paradigm of nursing is considered to relate to three domains of nursing science. These refer to the person, health and environment (Dodd et al., 2001). If we critically view this theory in terms of the above three domains, all three appear evident within the theory and framework. The person is considered to be contextualised in terms of demographic, psychological, sociological and physiological variables (Fawcett, 2005). Thus, these variables are central to the theory. The woman with breast cancer and the significant other is the demographic; the psychological component can be interpreted as the attachment style; the sociological component of this theory refers to the relationship and the dyadic processes which influence it; and the physiological aspect can be interpreted as the changes in physiological responses brought about by a breast cancer diagnosis including anxiety and depressive symptoms.

The domain of health consists of the variable pertinent to the quality of life in this study, although this could also be broadened to include risk factors and illness. The theory allows for further health outcomes to be included in the model and also facilitates comparing of health outcomes between the woman with breast cancer and her significant other.

Environment in terms of the meta-paradigm of nursing relates to physical, social and cultural variables. The social aspects are catered for in the theory in so far as it considers the nature of relationship and social interactions. The physical environment relates to the clinical setting, home or work. Although not explicitly described in the theory which was more psychological based, relational and social issues are considered to be constructs with which dyad relationships and attachment are closely linked. The addition of socio-demographics to the model (Figure 6.1) builds on the use of environmental issues that may influence the theory. It is worthy to note however that the theory is formalised in terms of child psychology and though extensively used and adapted for this context the main focus remains on psychological relationships and their influence on health. The social aspect of one’s environment is heavily considered in this theory which considers both the support structure as well as the interpersonal processes and cross interdependence of effects.

Overall, Attachment Theory meets the criteria of ensuring suitability and appropriateness to the study. The expanding use of the theory in new and interesting ways has lent itself to being a viable framework for studying women within the breast cancer context. It not only emphasises the importance of relationships within this context (specifically dyadic ones) but also determined the intricate relationship that can exist between couples (intimate and non-intimate) coping with breast cancer. The inclusion of a theory that incorporated relationship constructs whilst also determining its effect on health outcomes adds richness to health studies and ultimately ensures that a complete and holistic model of care is provided.

Summary

In summary, the findings of this research study in relation to empirical and theoretical literature around quality of life and the influencing factors for women with breast cancer (n=147) and their significant others (n=127) have been discussed. The findings of this study were compared to the existing literature. The associations between socio-demographics, relationship orientation, relationship behaviours, relationship outcomes and affective states (i.e. anxiety and depressive symptoms) on QOL have been addressed. In addition, the contribution of the findings to the current body of knowledge relating to breast cancer have also been presented. The study results highlight the importance of determining factors that can be influential in terms of QOL not just for the woman with breast cancer but also her significant other. In contrast to previous research, QOL for significant others was observed as being significantly lower than that of woman with breast cancer.

The study also demonstrated that attachment theory, utilised in the form of a framework developed by Pietromonaco et al., (2013) and further adapted by the researcher (Figure 6.1) can provide both a conceptual and practical means to examine the relationship dynamics when viewing the dyad specifically in relation to a chronic illness such as breast cancer.

Overall Summary

In chapter one of this thesis an overview of breast cancer including definition, treatments, staging as well as a discussion on relationships within a breast cancer context was provided. It was highlighted that breast cancer is one of the most widely diagnosed cancers, with incidences expected to increase in forthcoming years. Breast cancer is increasingly becoming the most common cancer diagnosed in women in both the developed and developing world. In Ireland, breast cancer is ranked as the number one cancer in female populations. Breast cancer incidences continue to increase with over 2,500 cases being diagnosed annually (NCRI, 2016). Although diagnoses are increasing, improved healthcare programmes and treatments are resulting in increases in survivorship rates. Healthcare restructuring means that the significant others of the women with breast cancer are now more than ever involved in the woman’s care, whereby breast care services are more frequently catered for in an outpatient setting.

In chapter two the theoretical literature around relationships and health was discussed in an attempt to locate a suitable theory on which to frame this study. While several theories were reviewed, Bowlby’s (1969) attachment theory was chosen as it applies to dyadic relationships and how attachment styles influences relationships and health processes. Subsequently, a framework developed by Pietromonaco et al., (2013) was identified as being applicable to the breast cancer context.

In chapter three the empirical literature pertaining to the supportive relationships between women with breast cancer and their significant other was reviewed using Bowlby's (1969) attachment theory concepts. Within this chapter several issues were identified. These included: the need for women and their significant other to be supported throughout a breast cancer diagnosis, the negative effects of not having support, the diverse sources of support available to women i.e. family, friends, spouses, as well as the important role that a dyadic relationship plays in providing this support for women with breast cancer and their significant other. From this chapter the importance of relationships within the breast cancer context was evident. The review identified that women and their supportive person are both involved in the breast cancer trajectory. The significant other was seen as going beyond a spouse or partner and relating to a wider categorisation of individuals including parent, sibling, friend and relative. The relationship processes were noted to be relevant to health outcomes, not only for the woman but also for her supportive person. The literature review presented a gap in the existing body of knowledge, as little is known regarding the correlation between relationships and health outcomes of women with breast cancer and their significant other. Hence, the need for a study exploring dyadic relationships and health outcomes of this sample was identified.

The methodology for a research study focusing on the influence of attachment styles, dyadic processes and health processes on health outcomes of women with breast cancer and their identified significant other was outlined in chapter four. A correlational study of a sample of women with breast cancer and their significant others was conducted in an acute hospital in the south of Ireland. The study utilised a survey design underpinned by a framework based on Bowlby's (1969) attachment theory which was adapted slightly for this purpose (Figure 4.1). Within chapter four the aim, objectives, and the sampling technique, access to the sample, data collection and analysis processes as well as the ethical considerations and challenges pertinent to this study were presented. Issues of reliability and validity were also addressed.

Within chapter five the findings of the study were presented, in the context of the main hypotheses and objectives. Findings demonstrated that QOL for women with breast cancer and their significant others is significantly impacted on by anxiety and depressive symptoms ($p<0.001$). In addition, the group that the person belongs to i.e. whether the “woman with breast cancer” group or the “significant other” group was also seen as influencing QOL outcomes. Women with breast cancer ranked their quality of life higher in comparison to their significant other. Furthermore, quality of life for women with breast cancer was influenced by whether or not the woman was pre-treatment or current in treatment, with women pre-treatment demonstrating poorer quality of life overall, than women who are in treatment.

A discussion of the findings is presented in chapter six. The discussion highlighted that in terms of QOL for women with breast cancer and their significant other anxiety and depressive symptoms were significantly associated with QOL as was evident within the literature. Additionally, the phase of treatment that the woman with breast cancer was at also influenced QOL. Furthermore, the necessity for research exploring dyads has been highlighted in order to ensure QOL for both women with breast cancer and significant others is considered, if a holistic approach to care is to be achieved. As previously suggested, significant others of women with breast cancer can be prone to negative psychological ailments as well as decreases in QOL due to the woman being diagnosed with breast cancer.

Strengths

This study is one of a few within Ireland that utilised a psychology based theory to examine dyadic relationships. The study also used and adapted a framework that was based on attachment theory. The framework that was devised from this study (Figure 6.1) may offer future researchers a basis for research as it encompasses key elements of dyadic processes, health processes but also key socio-demographics. This framework can be used to guide studies that aim to explore dyadic relationships within a breast cancer context. The framework utilised aspects of Pietromonaco et al., (2013) work and has also been heavily influenced by the empirical literature, ensuring it is suitable to this context. The framework not only considers socio-demographic, relational, affective states and health processes but also depicts the individual as well as a dyad element. Up to now research has focused more on the woman with breast cancer or caregivers as oppose to focusing on the dyad, despite both woman with breast cancer and significant others expressing a desire to be involved in care. In addition, the need to involve significant others in the care of women with breast cancer is necessary due to the changes in healthcare.

The study has contributed to the body of knowledge in existence relating to dyads within a breast cancer context and has provided a foundation for further research. It has provided interesting results highlighting significant others as a group that needs to be considered further in relation to breast cancer care with specific focus on their QOL.

The study accessed women at a crucial time in their breast cancer trajectory. To date the time of diagnosis and early treatment has received little focus in term of research. Prior to this, studies on women with breast cancer were usually carried out at 3, 6 or 12 month intervals or dealt with later timelines in the cancer trajectory. Accessing the women at diagnosis stage provided an insight into the challenges at this time and also supported the feasibility of further research at this time point.The use of validated instruments within the questionnaire pack has expanded the contexts with which these instruments can be used and has also provided a data collection tool that may be used in further research on women with breast cancer and their significant other.

Analysis of data incorporated a method that allowed for both individual data (i.e. the woman with breast cancer only and the significant other only) and dyadic data to be collected and analysed, thus ensuring maximum use of available data. The use of the Actor-Partner Interdependence Model to analyse the data is also unique within nursing research in this context.

Limitations

This study focused on women with breast cancer only, whereas males with breast cancer and their significant other may provide differing results. The sample was quite homogenous in nature and so generalizability of results is not possible. In addition, the sample size was limited as some women returned questionnaires but their significant others did not (n=20). Therefore, a disparity exists between the samples, resulting in the sample containing women with breast cancer (n=147) and significant others (n=127). Including a larger sample size may have provided more diverse results and overcome the limitation of the homogenous sample group.

The study was conducted in both a pre-assessment clinic and an outpatient clinic, in an attempt to maximise response rate and gain an insight into both clinical areas. However, the researcher was not available to be present in both clinics at all times thus, potential women with breast cancer who met the inclusion criteria may have been missed. The study was conducted in an acute setting and so results in relation to community services offered to women with breast cancer throughout their cancer trajectory may offer differing findings.

The initial design of the study was longitudinal in nature however, following consultation with ethics and challenges met throughout the process, a descriptive correlational survey design was utilised. A longitudinal study may have provided observations in terms of changes in QOL over time as well as allowing further in depth comparison to be made between women with breast cancer at diagnosis and those who were currently involved in treatment.

Furthermore, while the design of the study was useful in presenting an insight into factors that influence QOL for both the woman with breast cancer and her significant other it did not identify reasons for the QOL of significant others being lower than that of the woman. This has implications for further study. The recommendations for practice, education and further research are now presented.

Recommendations

Practice

Context 1: This study has demonstrated the important role that relationships can play when dealing with a breast cancer diagnosis, within the clinical setting. Relationships form an integral part of daily life and when dealing with a life challenge or event, relationships can be instrumental in helping women and significant others to cope. In practice, the diagnosis of breast cancer is not only given to the woman but also her significant others and family. Supportive measures need to be in place for both the woman and her significant other. This is particularly relevant within Ireland where a transference of care services has resulted in oncology care being provide on an outpatient basis more frequently, thus family and significant others are often the key providers of care for these women. Therefore recommendations include the need for nurses to:

R1: Involve significant others in the development of nursing care plans, decision making and nurse-patient interactions.

R2: Increase awareness of the impact that a breast cancer diagnosis has on the significant other and identify significant others as an at risk group, with specific needs throughout the cancer trajectory.

R3: Provide targeted support structures for significant others (e.g. counselling services, pastoral care) during the cancer journey.

Education

Context 1: A greater understanding of relationships and how they influence health can ensure that HCP's are providing optimum care to both the woman with breast cancer and her significant other. This is crucial to ensuring women with breast cancer and their significant other are receiving holistic evidence based care. Knowledge and education needs to be provided to those involved in caring for women with breast cancer. Thus, the need to:

R1: Educate nurses (specifically those working within the breast cancer context) of the importance of including significant others in the care of the woman with breast cancer.

Policy

Context 1: The important role that significant others play in the life of the woman with breast cancer is highlighted in this study. While some guidelines and protocols have begun to incorporate the significant other of women with breast cancer including the new guidelines by the National Cancer Control Programme (NCCP) and the Department's National Clinical Effectiveness Committee (HSE, 2016), further strategies need to be developed that focus on the significant others. Hence policy makers need to:

R1: Develop a comprehensive oncology support service plan nationally as part of a national cancer strategy, incorporating the significant other of the woman with breast cancer, in all aspects of care as a key individual.

R2: Develop a cancer competency framework that incorporates and promotes the involvement of family members, significant others and friends in the care process.

Research

Context 1: Previous research has focused on the woman with breast cancer or caregivers of women with breast cancer but few studies have been conducted that explore the influence a cancer diagnosis has on the dyadic relationship, despite both women with breast cancer and their loved ones requesting involvement in care. Relationships form an integral part of human life and thus their importance in helping women with a breast cancer diagnosis and their significant other should not be underrated. Breast cancer and its associated treatments can have a significant impact on the woman with breast cancer and her significant other. Research that investigates influencing factors on QOL and the relationship in terms of viewing the dyad (i.e. both the woman with breast cancer and her significant other) can provide further insight into relationships and health outcomes. Thus, there is a further need to:

R1: Conduct research utilising dyads in the breast cancer context where larger samples are available. A longitudinal mixed methods study would offer a more optimum means of collecting data from dyads and allow for exploration of the ongoing effects of breast cancer.

Context 2: This study was conducted with women with breast cancer in the acute setting due to the nature of services being more focused towards outpatient settings. In future, utilising community services, focus groups or support groups for individuals dealing with a breast cancer diagnosis may be of benefit. This would support current trends within the Irish healthcare system where a transference of care services, specifically cancer care services means community settings are now more than ever providing care to women with breast cancer. Hence, the need to:

R2: Conduct mixed methods studies in the breast cancer context with dyads in the community setting investigating and exploring quality of life within dyads.

Context 3: As evident in this study, significant others of women with breast cancer can report lower quality of life scores than the women with breast cancer themselves. Therefore, further research, particularly in terms of the experiences of significant others in dealing with a breast cancer diagnosis, is necessary. It is recommended to:

R3: Conduct qualitative research focusing on factors that influence the quality of life of significant others when they are involved in a relationship (intimate or non-intimate) with a woman with breast cancer.

Conclusion

In conclusion, this study contributes to the expanding knowledge on quality of life and the role that significant others play in relation to dealing with a breast cancer diagnosis. It illustrates the key factors that influence QOL for both the woman with breast cancer (n=147), her significant other (n=127) and the dyad (n=114). Overall, anxiety and depressive symptoms were shown to both be negatively correlated with QOL. In addition to affective states (i.e. anxiety and depressive symptoms) influencing QOL for both the woman with breast cancer and her significant other, the phase of treatment i.e. whether at diagnosis stage or involved in treatment also influenced QOL. The group that the individual belonged to i.e. whether the woman with breast cancer or her significant other also impacted on QOL. Interestingly, significant others appeared to rate their quality of life as lower than the woman with breast cancer. These findings build on existing knowledge on both women with breast cancer and their significant others within the breast cancer context. To the researchers knowledge, this study is one of the few, that has utilised a psychology based theory and framework within a breast cancer context to explore the dyadic relationship in an Irish context.

The thesis concludes that while further research around attachment styles and health outcomes within the breast cancer context is necessary, a clear relationship between attachment style and quality of life was not evident, however dyadic relationships appear to have an influence on the health outcomes (i.e. QOL) of women with breast cancer and their identified significant other. This thesis supports the rationale for further research on dyadic relationships and the incorporation of significant others in care practices.

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Appendices

Appendix 1 Stages of Breast Cancer

Stage	Location	Lymph Node Involvement	Tumour Size	Metastasis
Stage 0	Cancerous cells are located inside breast duct	No lymph node involvement	No	No
Stage IA	Cancer has not spread outside of breast tissue	No lymph node involvement	Tumour measures up to 2cm	No
Stage IB	Tumour in breast is smaller than 2cm OR No tumour in breast tissue but group of cancerous cells in lymph nodes	0.2mm-2mm cancerous cells in lymph nodes	Smaller than 2cm	No
Stage IIA	Tumour in breast tissue measures 2 cm or smaller but not in auxiliary lymph nodes OR No tumour in breast tissue but cancerous cells in auxiliary lymph nodes (ALN)	Yes can be in ALN	Smaller than 2cm	No
Stage IIB	Has spread to ALN OR Has not spread to ALN	ALN can be involved	Tumour between 2cm-5cm OR Tumour larger than 5cm	No
Stage IIIA	No tumour found in breast tissue, Cancerous cells found in ALN OR Lymph nodes near breastbone	ALN or nodes near breastbone can be involved	No	No
Stage IIIB	Tumour can be any size	ALN can be involved or lymph nodes near breastbone	Yes any size tumour	May have spread to chest wall/skin of breast
Stage IIIC	No sign of cancerous cells in breast tissue OR Tumour present that is any size	Lymph nodes in collarbone, breastbone (above/below) can be involved ALN can be involved	Yes	May have spread to chest wall/skin of breast
Stage IV	Cancer has spread outside breast to other part of body	Can have nodes involved	Yes	Yes

Appendix 2 Theory/ Model Search Strategy

Pub Med

1 model
2 Search theory
3 (((theory) AND models) AND family) AND relationships
4 ((dyads) AND partners) AND significant others
5 ((dyads) AND partners) AND significant others
6 (((theory) AND theories) AND model) AND models
7 ((((((((family) OR carers) OR caregivers) OR families) OR partners) OR partner) OR significant other) OR significant others) OR spouses) AND spouse
8 (((theory) OR theories) OR model) OR models
9 (((((theory) OR theories) OR model) OR models)) AND (((((((((family) OR carers) OR caregivers) OR families) OR partners) OR partner) OR significant other) OR significant others) OR spouses) AND spouse)
10 ((relationships) OR relationship) OR dyads
11 ((((relationships) OR relationship) OR dyads)) AND ((((((theory) OR theories) OR model) OR models)) AND (((((((((family) OR carers) OR caregivers) OR families) OR partners) OR partner) OR significant other) OR significant others) OR spouses) AND spouse))
12 (((((relationships) OR relationship) OR dyads)) AND ((((theory) OR theories) OR model) OR models)) AND (((((((((family) OR carers) OR caregivers) OR families) OR partners) OR partner) OR significant other) OR significant others) OR spouses) AND spouse).

CINAHL

1. AB theory OR AB model OR AB theories OR AB models
2. AB relationships OR AB relationship OR AB dyad OR AB dyads OR AB dyadic
3.AB relative OR AB family OR AB spouse OR AB partner OR AB carer OR AB caregiver OR AB significant other OR AB significant others
4.(AB relative OR AB family OR AB spouse OR AB partner OR AB carer OR AB caregiver OR AB significant other) AND (S1 AND S2 AND S3)
5. (AB relative OR AB family OR AB spouse OR AB partner OR AB carer OR AB caregiver OR AB significant other) AND (S1 AND S2 AND S3)
6. (AB relative OR AB family OR AB spouse OR AB partner OR AB carer OR AB caregiver OR AB significant other) AND (S1 AND S2 AND S3) Limiters - Abstract Available; English Language; Peer Reviewed; Search modes - Boolean/Phrase
7. AB patient OR AB client OR AB sufferer Limiters - Abstract Available; English Language; Peer Reviewed; Search modes - Boolean/Phrase
8. (AB patient OR AB client OR AB sufferer) AND (S1 AND S2 AND S7)
9. ((AB patient OR AB client OR AB sufferer) AND (S1 AND S2 AND S7)) AND (S1 AND S2 AND S3 AND 7) Search modes - Boolean/Phrase
10. AB theory OR AB model
11. (AB theory OR AB models) AND (S6 AND S10)
12. ((AB theories OR AB models) AND (S6 AND S10)) AND (S8 AND S10)
13. (((AB theory OR AB models) AND (S6 AND S10)) AND (S8 AND S10)) AND (S8 AND S10)
14. (((AB theory OR AB model) AND (S6 AND S10)) AND (S8 AND S10)) AND (S8 AND S10) Limiters - English Language; Peer Reviewed; Search modes - Boolean/Phrase

15. (((AB theory OR AB model) AND (S6 AND S10)) AND (S8 AND S10)) AND (S8 AND S10) Limiters - Published Date: 20000101-20131231; English Language; Peer Reviewed; Search modes - Boolean/Phrase.
16. ((((AB theory OR AB model) AND (S6 AND S10)) AND (S8 AND S10)) AND (S8 AND S10)) AND (S1 AND S2 AND S3 AND S7 AND S10)

MedLine
1.Theory.mp. or exp theories
2. models.mp.
3.(models adj6 relationships).ti.ab
4.(model adj6 theory).ti.ab
5.(models adj6 theories).ti.ab
6. family or families or carers or caregivers or relatives or relative.mp.
12. partner or partners or spouse or spouses mp.
13.(model adj6 (carer or caregiver or relative or spouse or partner or family)
14exp Theory
15. exp Model.mp.
16. exp partner
17. exp Family or Relative
18. dyad.mp
19. (family adj6 (theory or model or theories or theory or framework).mp
20. exp relationships
21. 1 and 2 and 6 and 20

PsychInfo
1. MJ theory
2. MJ theory Limiters - Search modes - Boolean/Phrase
3. theory.mp. or exp model
4. theory or exp theories
5. MJ models
6. MJ model
7. AB model adj6 theory
8. TX theory adj6 model
9. AB model adj6 theory
10. AB (models adj6 theory*)
11. AB models adj6 theories
12. AB model adj8 theories
13. AB model adj6 theory
14. AB model adj6 theory or theories or models or framework or frameworks
15. TI model adj6 theory or theories or models or framework or frameworks
16. AB family or families or carers or caregivers or caregiver
17. TI family or families or carers or caregivers or caregiver
18. TI partner or partners or significant others or significant other
19. AB relationships or relationship or relations or relation or dyad or dyads
20. AB health
21. AB healths
22. AB relationships exp
23. TI relationship exp
24. MJ relationship exp
25. MJ family exp

26. AB family relationships
27. AB dyadic or dyadics
28. (AB (dyadic and family relationships)) AND (S1 AND S6 AND S16 AND S19 AND S20).

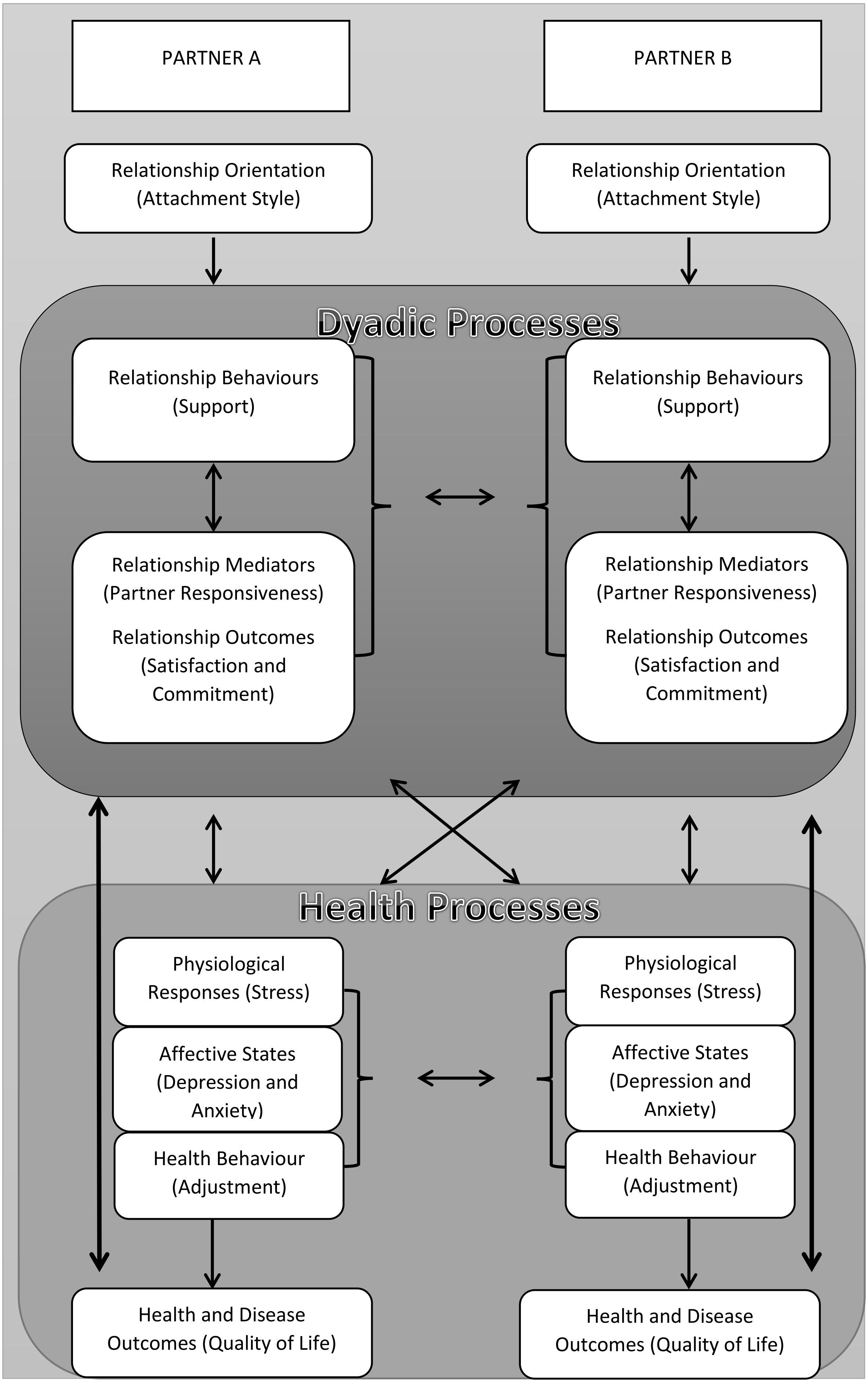
Cochrane
1. theory OR theories OR model OR models OR framework OR frameworks in Abstract
2. relationship OR relationships OR dyad OR dyads OR dyadic in Abstract
3. relative OR family OR carer OR carers OR spouse OR spouses OR caregiver OR partner OR partners in All Fields
4. relative OR family OR carer OR carers OR spouse OR spouses OR caregiver OR partner OR partners in Abstract
5. Theories or Theory in All Fields
6. family OR families OR relative OR relatives in Abstract AND relationships OR relationship OR dyad OR dyadic in All Fields
7. 5 AND 6 in Abstract
8. 1 AND 5 AND 6 in Abstract

Web of Knowledge/Science
1. theory OR model OR theories OR models in All Fields
2. family OR families OR relatives OR relative OR partner OR partners OR carers OR caregivers OR care providers in Abstract
3. relationships OR relationship OR dyad OR dyads OR dyadic OR dyadic relationship in All Fields
4. health OR health outcomes OR health status in Abstract
5. 1 AND 2 in Abstract
6. 3 AND 4 in Abstract
7. 3 AND 4 in All Fields
8. 5 AND 7 in All Fields
9. 6 AND 8 in Abstract

Appendix 3 Table of Theories and Models

Theory/ Model	Description	Pros	Cons
Attribution Theory (Heider, 1958)	Describes how individuals interpret events and how this relates to their thinking and behaviour. Attribution theory assumes that people try to determine why people do what they do. A person seeking to understand why another person did something may attribute one or more causes to that behaviour. According to Heider a person can make two attributions 1) Internal attribution, the inference that a person is behaving in a certain way because of something about the person, such as attitude, character or personality. 2) External attribution, the inference that a person is behaving a certain way because of something about the situation he or she is in.	Provided a theoretical foundation to attribute actions or mannerisms to. Could be applied to determine why women and significant others act in a certain way (respond) to breast cancer.	Application to relationships would only be applied to seeing why one behaves in a certain way, doesn't provide an understanding of the relationships influence on breast cancer.
Bio-psychosocial Model (Engel,1977)	Approach linking biological, psychological, emotional, behavioural and social (socio-economical, socio-environmental, and cultural) factors, with human functioning in the context of disease or illness. For health it is seen as a combination of biological, psychological, and social factors rather than purely in biological terms.	Applicable to health as being influenced by biological, psychosocial, emotional factors which is good for a broader understanding of Health especially chronic disease	Critics of this model have further proposed that spiritual constructs also effect an individual's disease or illness
Caring Model (Watson.,1979)	Major elements of her theory are (a) the carative factors, (b) the transpersonal caring relationship, and (c) the caring occasion/caring moment. Watson views the "carative factors" as a guide for the core of nursing. She uses the term carative to contrast with conventional medicine's curative factors. Her carative factors attempt to "honor the human dimensions of nursing's work and the inner life world and subjective experiences of the people we serve" (Watson, 1997b, p. 50). In all, the carative factors are comprised of 10 elements: these were later updated to 14 carative factors.	Considers caring nature of relationships. Could potentially identify caring factors in relationships between women and significant other.	This model is very concerned with the caring of the individual; however other aspects other than the caring interaction may be present in the breast cancer relationship.
Family Functioning Model McMatser (Epstein et al., 1978)	Family functioning is related to 6 dimensions. These are problem solving, communication, roles, behavioural control, affective responsiveness and affective involvement. The aspects of systems theory which underlie the model to be presented can be summarized as follows: 1. Parts of the family are related to each other. 2. One part of the family cannot be understood in isolation from the rest of the 3. Family functioning is more than just the sum of the parts. 4. A family's structure and organization are important in determining the behaviour of family members. 5. Transactional patterns of the family system are involved in shaping the behaviour.	Encompasses entire family as needing consideration in relationships. Looks at how one member in family can be affected by others.	Values have a great effect on the judgment and evaluation of behaviour, and they have to be taken into consideration using this model.
Social Exchange Theory (Thibaut and Kelley, 1959)	Clarifies when and why individuals develop and continue some personal relationships while ending others. The theory is based on a system of rewards and costs. SET states that personal relationships are a function of comparing benefits gained versus costs to attain those benefits. People want to make the most of the benefits while lessening the costs (Mini-max Principle). Maintains that, by nature, humans are selfish. Thus, as a human being, one tends to look out for oneself first and foremost. SET has three core components outcome, comparison level and comparison level of alternatives.	Applicable to relationships which would suit this discussion if focusing on dyads. Uses measuring up of cost versus gains which could be applied to dyad of women with breast cancer and partner. It simplifies relationships in this manner.	Seen as contradictory to the authors' needs as caring themes were evident that were not compatible with SET components. The idea of weighing up cost versus benefits in caring was seen simplified.

Appendix 4 Attachment Diagram for Breast Cancer Context Phase 1



Appendix 5 Search Strategy

MeSH Search Strategy

1."Search breast neoplasm
2."Search (cancer OR tumour OR tumor Or neoplasm OR malignant[MeSH Terms])",983,04:18:57#18,"Search ((((family OR carer OR spouse OR partner OR caregiver OR relative[MeSH Terms]))) AND ((cancer OR tumour OR tumor Or neoplasm OR malignant[MeSH Terms]))) AND support"
3."Search (support OR needs OR wants OR preferences OR care[MeSH Terms])",
4."Search (family OR carer OR spouse OR partner OR caregiver OR relative[MeSH Terms])",
5."Search patient[MeSH Terms]",
6."Search patient[MeSH Terms] OR clients OR sufferers",
7."Search ((((breast neoplasm) AND ((cancer OR tumour OR tumor Or neoplasm OR malignant[MeSH Terms]))) AND ((support OR needs OR wants OR preferences OR care[MeSH Terms]))) AND ((family OR carer OR spouse OR partner OR caregiver OR relative[MeSH Terms]))) AND (patient[MeSH Terms] OR clients OR sufferers)",
8."Search ((((breast neoplasm) AND ((cancer OR tumour OR tumor Or neoplasm OR malignant[MeSH Terms]))) AND ((support OR needs OR preferences OR care[MeSH Terms]))) AND ((family OR carer OR spouse OR partner OR caregiver OR relative[MeSH Terms]))) AND (patient[MeSH Terms] OR sufferers)",
9."Search (((((breast neoplasm) AND ((cancer OR tumour OR tumor Or neoplasm OR malignant [MeSH Terms]))) AND ((support OR needs OR preferences OR care AND ((family OR carer OR spouse OR partner OR caregiver OR relative[MeSH Terms]))) AND (patient[MeSH Terms])",
10."Search breast neoplasm exp",
11."Search support",
12."Search breast cancer",
13."Search breast cancer OR breast tumour OR breast tumor OR breast neoplasm",
14."Search support or needs",
15."Search family",
16."Search family OR carer OR spouse",
17."Search ((((family OR carer OR spouse)) AND (support or needs)) AND (breast cancer OR breast tumour OR breast tumor OR breast neoplasm)) AND (patient OR clients OR sufferers)"

MeSH Terms

Support

- Social Networks
- Network, Social
- Networks, Social
- Social Network
- Psychosocial Support Systems
- Psychosocial Support System
- Support System, Psychosocial
- Support Systems, Psychosocial
- System, Psychosocial Support
- Systems, Psychosocial Support

Relative

- Spouse
- Married Persons
- Married Person
- Person, Married
- Persons, Married
- Spouse
- Husbands

- Husband
- Domestic Partners
- Domestic Partner
- Partner, Domestic
- Partners, Domestic
- Spousal Notification
- Notification, Spousal, Psychosocial
- Wives
- Wife

Patient
- Clients
- Client

Neoplasm
- Tumors
- Tumor
- Neoplasia
- Neoplasm
- Benign Neoplasms
- Neoplasms, Benign
- Benign Neoplasm
- Neoplasm, Benign
- Cancer
- Cancers

Breast cancer
- Breast Neoplasm
- Neoplasm, Breast
- Neoplasms, Breast
- Tumors, Breast
- Breast Tumors
- Breast Tumor
- Tumor, Breast
- Mammary Carcinoma, Human
- Carcinoma, Human Mammary
- Carcinomas, Human Mammary
- Human Mammary Carcinomas
- Mammary Carcinomas, Human
- Human Mammary Carcinoma
- Mammary Neoplasms, Human
- Human Mammary Neoplasm
- Human Mammary Neoplasms
- Neoplasm, Human Mammary
- Neoplasms, Human Mammary
- Mammary Neoplasm, Human
- Breast Cancer
- Cancer, Breast
- Cancer of the Breast
- Cancer of Breast

CINAHL Search Strategy

1. AB cancer OR AB neoplasm OR AB tumor OR AB tumour
2. AB support OR AB care OR AB needs OR AB wants OR AB preferences
3.AB relative OR AB family OR AB spouse OR AB partner OR AB carer OR AB caregiver OR AB significant other

4.(AB relative OR AB family OR AB spouse OR AB partner OR AB carer OR AB caregiver OR AB significant other) AND (S1 AND S2 AND S3)
5. (AB relative OR AB family OR AB spouse OR AB partner OR AB carer OR AB caregiver OR AB significant other) AND (S1 AND S2 AND S3)
6. (AB relative OR AB family OR AB spouse OR AB partner OR AB carer OR AB caregiver OR AB significant other) AND (S1 AND S2 AND S3) Limiters - Abstract Available; English Language; Peer Reviewed;Search modes - Boolean/Phrase
7. AB patient OR AB client OR AB sufferer Limiters - Abstract Available; English Language; Peer Reviewed;Search modes - Boolean/Phrase
8. (AB patient OR AB client OR AB sufferer) AND (S1 AND S2 AND S7)
9. ((AB patient OR AB client OR AB sufferer) AND (S1 AND S2 AND S7)) AND (S1 AND S2 AND S3 AND 7)Search modes - Boolean/Phrase
10. AB breast OR AB mastectomy
11. (AB breast OR AB mastectomy) AND (S6 AND S10)
12. ((AB breast OR AB mastectomy) AND (S6 AND S10)) AND (S8 AND S10)
13. (((AB breast OR AB mastectomy) AND (S6 AND S10)) AND (S8 AND S10)) AND (S8 AND S10)
14. (((AB breast OR AB mastectomy) AND (S6 AND S10)) AND (S8 AND S10)) AND (S8 AND S10) Limiters - English Language; Peer Reviewed; Search modes - Boolean/Phrase
15. (((AB breast OR AB mastectomy) AND (S6 AND S10)) AND (S8 AND S10)) AND (S8 AND S10) Limiters - Published Date: 20000101-20131231; English Language; Peer Reviewed; Search modes - Boolean/Phrase.
16. ((((AB breast OR AB mastectomy) AND (S6 AND S10)) AND (S8 AND S10)) AND (S8 AND S10)) AND (S1 AND S2 AND S3 AND S7 AND S10)

Cochrane Search Strategy

1. cancer OR neoplasm OR tumor OR tumour OR metastases in Abstract
2. support OR needs OR wants OR preferences OR care in Abstract
3. relative OR family OR carer OR carers OR spouse OR caregiver OR partner in All Fields
4. patient OR sufferer OR client in Abstract
5. patient OR sufferer OR client in All Fields
6. breast in Abstract
7. breast in Title
8. breast in All Fields
9.breast cancer in All Fields
10. cancer OR neoplasm OR tumor OR tumour in Abstract AND support OR care OR needs OR wants OR preferences in All Fields
11.cancer OR neoplasm OR tumor OR tumour in Abstract AND support OR care OR needs OR wants OR preferences in Abstract
12. cancer OR neoplasm OR tumor OR tumour in Abstract AND support OR care OR needs OR wants OR preferences in Abstract AND relative OR partner OR carer OR caregiver Or Spouse OR family in Abstract AND patient OR sufferer OR client in Abstract AND breast in Abstract

Embase Search Strategy

1.'breast'/exp OR breast AND ('neoplasm'/exp OR neoplasm) AND [2000-2014]/py
2. neoplasm.mp.or AND exp AND 'breast'/exp AND 'neoplasm'/exp AND [2000-2014]/py
3. 'breast'/mj AND 'tumour'/mj OR 'tumor'/mj OR 'neoplasm'/mj AND [2000-2014]/py
4. 'breast'/exp AND 'cancer'/exp AND [2000-2014]/py
5. 'breast'/exp AND 'cancer'/exp OR 'neoplasm'/exp OR 'tumour'/exp OR 'tumor'/exp OR malignant OR 'carcinoma'/exp OR 'growth'/exp AND [2000-2014]/py
6. 'breast'/exp AND adj6 AND 'cancer'/exp OR 'tumour'/exp OR 'tumor'/exp OR neoplasm.:ab AND [2000-2014]/py

7. support OR care OR needs OR wants OR preferences:ab AND [2000-2014]/py
8. support OR care OR needs OR wants OR preferences:ab,ti AND [2000-2014]/py
9. support OR care OR needs OR wants OR preferences OR exp AND support AND needs AND [2000-2014]/py
10. 'relative'/exp OR 'family'/exp OR 'carer'/exp OR 'spouse'/exp OR 'caregiver'/exp OR partner:ab AND [2000-2014]/py
11. 'relative'/syn OR 'carer'/syn OR 'family'/syn OR 'spouse'/syn OR 'caregiver'/syn OR partner:ab AND [2000-2014]/py
12. 'relative'/syn OR 'carer'/syn OR 'family'/syn OR 'spouse'/syn OR 'caregiver'/syn OR partner:ab AND [2000-2014]/py
13. 'relative'/exp/mj OR 'carer'/exp/mj OR 'family'/exp/mj OR 'spouse'/exp/mj OR 'caregiver'/exp/mj OR partner:ab,ti AND [2000-2014]/py
14. 'patient'/exp OR client OR sufferer AND [2000-2014]/py
15. 'patient'/syn OR client OR sufferer AND [2000-2014]/py
16. 'relative'/exp/mj OR 'family'/exp/mj OR 'carer'/exp/mj OR 'spouse'/exp/mj OR 'caregiver'/exp/mj OR partner:ab AND [2000-2014]/py
17. 'patient'/syn OR client OR sufferer:ab AND [2000-2014]/py
18. 'patient'/syn OR client OR sufferer:ab AND [2000-2014]/py OR exp AND 'patient needs' AND [2000-2014]/py
19. ('breast'/exp OR breast AND ('neoplasm'/exp OR neoplasm) AND [2000-2014]/py) AND (support OR care OR needs OR wants OR preferences:ab AND [2000-2014]/py) AND ('patient'/exp OR client OR sufferer AND [2000-2014]/py)

20. ('relative'/exp OR 'family'/exp OR 'carer'/exp OR 'spouse'/exp OR 'caregiver'/exp OR partner:ab AND [2000-2014]/py) AND (('breast'/exp OR breast AND ('neoplasm'/exp OR neoplasm) AND [2000-2014]/py) AND (support OR care OR needs OR wants OR preferences:ab AND [2000-2014]/py) AND ('patient'/exp OR client OR sufferer AND [2000-2014]/py))

21. ('breast'/exp AND adj6 AND 'cancer'/exp OR 'tumour'/exp OR 'tumor'/exp OR neoplasm.:ab AND [2000-2014]/py) AND (support OR care OR needs OR wants OR preferences OR exp AND support AND needs AND [2000-2014]/py) AND ('relative'/exp/mj OR 'family'/exp/mj OR 'carer'/exp/mj OR 'spouse'/exp/mj OR 'caregiver'/exp/mj OR partner:ab AND [2000-2014]/py) AND ('patient'/syn OR client OR sufferer:ab AND [2000-2014]/py OR exp AND 'patient needs' AND [2000-2014]/py)

22. ('breast'/mj AND 'tumour'/mj OR 'tumor'/mj OR 'neoplasm'/mj AND [2000-2014]/py) AND (support OR care OR needs OR wants OR preferences:ab,ti AND [2000-2014]/py) AND ('relative'/syn OR 'carer'/syn OR 'family'/syn OR 'spouse'/syn OR 'caregiver'/syn OR partner:ab AND [2000-2014]/py) AND ('patient'/syn OR client OR sufferer:ab AND [2000-2014]/py)

23. ('breast'/mj AND 'tumour'/mj OR 'tumor'/mj OR 'neoplasm'/mj AND [2000-2014]/py) AND (support OR care OR needs OR wants OR preferences:ab,ti AND [2000-2014]/py) AND ('relative'/syn OR 'carer'/syn OR 'family'/syn OR 'spouse'/syn OR 'caregiver'/syn OR partner:ab AND [2000-2014]/py) AND ('patient'/syn OR client OR sufferer:ab AND [2000-2014]/py) AND [english]/lim AND [2000-2014]/py

24. ('breast'/exp AND 'cancer'/exp OR 'neoplasm'/exp OR 'tumour'/exp OR 'tumor'/exp OR malignant OR 'carcinoma'/exp OR 'growth'/exp AND [2000-2014]/py) AND (support OR care OR needs OR wants OR preferences:ab,ti AND [2000-2014]/py) AND ('relative'/syn OR 'carer'/syn OR 'family'/syn OR 'spouse'/syn OR 'caregiver'/syn OR partner:ab AND [2000-2014]/py) AND ('patient'/syn OR client OR sufferer:ab AND [2000-2014]/py OR exp AND 'patient needs' AND [2000-2014]/py)

25. ('breast'/mj AND 'tumour'/mj OR 'tumor'/mj OR 'neoplasm'/mj AND [2000-2014]/py) AND (('breast'/exp AND 'cancer'/exp OR 'neoplasm'/exp OR 'tumour'/exp OR 'tumor'/exp OR malignant OR 'carcinoma'/exp OR 'growth'/exp AND [2000-2014]/py) AND (support OR care OR needs OR wants OR preferences:ab,ti AND [2000-2014]/py) AND ('relative'/syn OR 'carer'/syn OR 'family'/syn OR 'spouse'/syn OR 'caregiver'/syn OR partner:ab AND [2000-2014]/py) AND ('patient'/syn OR client OR sufferer:ab AND [2000-2014]/py OR exp AND 'patient needs' AND [2000-2014]/py))

Medline Search Strategy

1.breast neoplasm.mp. or exp Breast Neoplasm
2.breast cancer.mp.
3.(breast adj6 carcinoma).ti.ab
4.(breast adj6 cancer).ti.ab
5.(breast adj6 tumour).ti.ab
6.(breast adj6 tumor).ti.ab
7.(breast adj6(cancer or tumor or tumour or neoplasm or carcinogen or malignant or metastases or carcinoma or neoblastoma).tw,ot.
8. support.mp. or exp Social/ or Group
9.support or family or relative.mp.
10. exp Support or help.mp.
11. family support.mp.
12. carer (support or help or needs or intervention).mp.
13.(support adj6 (carer or caregiver or relative or spouse or partner or family)
14. (support adj6 (patient or client or sufferer)
15. (support adj6 (breast or cancer or tumor or tumour or malignant or neoplasm
16. exp Support Needs
17. exp Support Care.mp.
18. exp Supportive Care
19. exp Family or Relative
20. Care or help.mp
21. (care adj6 (breast or cancer or tumour or tumor or neoplasm or malignant).mp
22. exp humans
23. 7 and 17 and and 19 and 22
24. 1 or 2 or 6 or 7
25. 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18
26. 25 and 24
27. 19 or 25
28. 21 and 27
29. 13 and 7
30. 28 and 27

Psych Info Search Strategy

1. MJ breast neoplasm
2. MJ breast neoplasm Limiters - Publication Year: 2000-2013 Search modes - Boolean/Phrase
3. breast neoplasm.mp. or exp Breast Neoplasms
4. breast neoplasm or exp Breast Neoplasm
5. MJ breast cancer
6. MJ breast neoplasm
7. AB breast adj6 cancer or neoplasm
8. TX breast adj6 cancer or neoplasm
9. AB breast adj6 carcinoma

10. AB (breast adj6 carcinoma*)
11. AB breast adj6 tumour
12. AB breast adj8 tumor
13. AB breast adj6 neoplasm
14. AB breast adj6 cancer or neoplasm or tumour or malignant or carcinoma
15. TI breast adj6 cancer or neoplasm or tumour or malignant or carcinoma
16. AB support or care or needs
17. TI support or care or needs
18. TI support or care or needs or preferences or wants
19. AB care or psychosocial
20. AB social support
21. AB partner support
22. AB partner support exp
23. TI partner support exp
24. MJ partner support exp
25. MJ support exp
26. AB support domestic relation
27. AB help
28. AB spousal or partner help
29. (AB (spousal or partner help)) AND (S6 AND S16 AND S28).

<u>Pubmed Search Strategy</u>

1. (cancer[Title/Abstract]) OR neoplasm[Title/Abstract]) OR tumor[Title/Abstract]) OR tumour[Title/Abstract]

2. (breast[Title/Abstract]) OR mastectomy[Title/Abstract]

3. (support[Title/Abstract]) OR care[Title/Abstract]) OR needs[Title/Abstract]) OR wants[Title/Abstract]) OR preferences[Title/Abstract]

4.(relative[Title/Abstract]) OR family[Title/Abstract]) OR carer[Title/Abstract]) OR caregiver[Title/Abstract]) OR significant other[Title/Abstract]) OR spouse[Title/Abstract]) OR partner[Title/Abstract]

5.(patient[Title/Abstract]) OR client[Title/Abstract]) OR sufferer[Title/Abstract]

6. (cancer [Title/Abstract]) OR neoplasm[Title/Abstract]) OR tumor[Title/Abstract]) OR tumour[Title/Abstract])) AND ((breast[Title/Abstract]) OR mastectomy[Title/Abstract])) AND (((((support [Title/Abstract]) OR care[Title/Abstract]) OR needs[Title/Abstract]) OR wants[Title/Abstract]) OR preferences[Title/Abstract])

7. (cancer[Title/Abstract]) OR neoplasm[Title/Abstract]) OR tumor[Title/Abstract]) OR tumour[Title/Abstract])) AND ((breast[Title/Abstract]) OR mastectomy[Title/Abstract])) AND (((((support[Title/Abstract]) OR care[Title/Abstract]) OR needs[Title/Abstract]) OR wants[Title/Abstract]) OR preferences[Title/Abstract]))) AND (((patient[Title/Abstract]) OR client[Title/Abstract]) OR sufferer[Title/Abstract])

8. (cancer[Title/Abstract]) OR neoplasm[Title/Abstract]) OR tumor[Title/Abstract]) OR tumour[Title/Abstract])) AND ((breast[Title/Abstract]) OR mastectomy[Title/Abstract])) AND (((((support[Title/Abstract]) OR care[Title/Abstract]) OR needs[Title/Abstract]) OR wants[Title/Abstract]) OR preferences[Title/Abstract]))) AND (((((((relative[Title/Abstract]) OR family[Title/Abstract]) OR carer[Title/Abstract]) OR caregiver[Title/Abstract]) OR significant other[Title/Abstract]) OR spouse[Title/Abstract]) OR partner[Title/Abstract])

9.(cancer[Title/Abstract]) OR neoplasm[Title/Abstract]) OR tumor[Title/Abstract]) OR tumour[Title/Abstract])) AND ((breast[Title/Abstract]) OR mastectomy[Title/Abstract])) AND (((((support[Title/Abstract]) OR care[Title/Abstract]) OR needs[Title/Abstract]) OR wants[Title/Abstract]) OR preferences[Title/Abstract]))) AND (((patient[Title/Abstract]) OR client[Title/Abstract]) OR sufferer[Title/Abstract])) AND (((((((relative[Title/Abstract]) OR family[Title/Abstract]) OR carer[Title/Abstract]) OR caregiver[Title/Abstract]) OR significant other[Title/Abstract]) OR spouse[Title/Abstract]) OR partner[Title/Abstract])

10. (cancer[Title/Abstract]) OR neoplasm[Title/Abstract]) OR tumor[Title/Abstract]) OR tumour[Title/Abstract])) AND ((breast[Title/Abstract]) OR mastectomy[Title/Abstract])) AND (((((support[Title/Abstract]) OR care[Title/Abstract]) OR needs[Title/Abstract]) OR wants[Title/Abstract]) OR preferences[Title/Abstract]))) AND (((patient[Title/Abstract]) OR client[Title/Abstract]) OR sufferer[Title/Abstract])) AND (((((((relative[Title/Abstract]) OR family[Title/Abstract]) OR carer[Title/Abstract]) OR caregiver[Title/Abstract]) OR significant other[Title/Abstract]) OR spouse[Title/Abstract]) OR partner[Title/Abstract]) Filters: Humans

11. (cancer[Title/Abstract]) OR neoplasm[Title/Abstract]) OR tumor[Title/Abstract]) OR tumour[Title/Abstract])) AND ((breast[Title/Abstract]) OR mastectomy[Title/Abstract])) AND (((((support[Title/Abstract]) OR care[Title/Abstract]) OR needs[Title/Abstract]) OR wants[Title/Abstract]) OR preferences[Title/Abstract]))) AND (((patient[Title/Abstract]) OR client[Title/Abstract]) OR sufferer[Title/Abstract])) AND (((((((relative[Title/Abstract]) OR family[Title/Abstract]) OR carer[Title/Abstract]) OR caregiver[Title/Abstract]) OR significant other[Title/Abstract]) OR spouse[Title/Abstract]) OR partner[Title/Abstract]) Filters: published in the last 13 years; Humans

12. (cancer[Title/Abstract]) OR neoplasm[Title/Abstract]) OR tumor[Title/Abstract]) OR tumour[Title/Abstract])) AND ((breast[Title/Abstract]) OR mastectomy[Title/Abstract])) AND (((((support[Title/Abstract]) OR care[Title/Abstract]) OR needs[Title/Abstract]) OR wants[Title/Abstract]) OR preferences[Title/Abstract]))) AND (((patient[Title/Abstract]) OR client[Title/Abstract]) OR sufferer[Title/Abstract])) AND (((((((relative[Title/Abstract]) OR family[Title/Abstract]) OR carer[Title/Abstract]) OR caregiver[Title/Abstract]) OR significant other[Title/Abstract]) OR spouse[Title/Abstract]) OR partner[Title/Abstract]) Filters: Publication date from 2000/01/01 to 2013/12/31; Humans

13. (cancer[Title/Abstract]) OR neoplasm[Title/Abstract]) OR tumor[Title/Abstract]) OR tumour[Title/Abstract])) AND ((breast[Title/Abstract]) OR mastectomy[Title/Abstract])) AND (((((support[Title/Abstract]) OR care[Title/Abstract]) OR needs[Title/Abstract]) OR wants[Title/Abstract]) OR preferences[Title/Abstract]))) AND (((patient[Title/Abstract]) OR client[Title/Abstract]) OR sufferer[Title/Abstract])) AND (((((((relative[Title/Abstract]) OR family[Title/Abstract]) OR carer[Title/Abstract]) OR caregiver[Title/Abstract]) OR significant other[Title/Abstract]) OR spouse[Title/Abstract]) OR partner[Title/Abstract]) Filters: Publication date from 2000/01/01 to 2013/12/31; Humans

14. (cancer[Title/Abstract]) OR neoplasm[Title/Abstract]) OR tumor[Title/Abstract]) OR tumour[Title/Abstract])) AND ((breast[Title/Abstract]) OR mastectomy[Title/Abstract])) AND (((((support[Title/Abstract]) OR care[Title/Abstract]) OR needs[Title/Abstract]) OR wants[Title/Abstract]) OR preferences[Title/Abstract]))) AND (((patient[Title/Abstract]) OR client[Title/Abstract]) OR sufferer[Title/Abstract])) AND (((((((relative[Title/Abstract]) OR family[Title/Abstract]) OR carer[Title/Abstract]) OR caregiver[Title/Abstract]) OR significant other[Title/Abstract]) OR spouse[Title/Abstract]) OR partner[Title/Abstract]) Filters: Publication date from 2000/01/01 to 2013/12/31; Humans; English

Appendix 6 Population Intervention Comparison Outcome Timeframe (PICOT) Framework

	Population	Intervention	Comparison	Outcome	Timeframe
Main Keywords	Women, breast cancer, significant other.	Support/ aid/informal caring/ relationships	No support/ relationship/ ineffective relationships/ support	Improved health outcomes	Throughout the cancer trajectory
Synonym	Woman/Female/Females	Support/ aid/informal caring/ relationships	No support/ relationship/ ineffective relationships/ support	Improved health outcomes	Throughout the cancer trajectory
Synonym	Breast/ breasts/ mammary/mammaries/ cancer/cancers/ cancerous/ tumours/tumour/tumor/ tumors/ malignancy/ malignancies.	Support/ aid/informal caring/ relationships	No support/ relationship/ ineffective relationships/ support	Improved health outcomes	Throughout the cancer trajectory
Synonym	Partner/partners/ husband/ husbands/ family members/families/carers /caregivers/significant others/ spouses/spouse/relatives /friends.	Support/ aid/informal caring/ relationships	No support/ relationship/ ineffective relationships/ support	Improved health outcomes	Throughout the cancer trajectory

Appendix 7 List of Hits Achieved

Database	Keywords		Hits
Pubmed	cancer **OR** neoplasm **OR** tumor **OR** tumour (title/abstract)		1,608,476
	support **OR** care **OR** needs **OR** wants **OR** preferences (title/abstract)		1,514,949
	relative **OR** family **OR** significant other **OR** carer **OR** caregiver **OR** spouse **OR** partner (title/abstract)		1,119,645
	patient **OR** client **OR** sufferer (title/abstract)		1,444,651
SEARCH WITH **AND**	breast(title/abstract)		714
CINAHL	cancer **OR** neoplasm **OR** tumor **OR** tumour (title/abstract)		75,731
	support **OR** care **OR** needs **OR** wants **OR** preferences (title/abstract)		333,526
	relative **OR** family **OR** significant other **OR** carer **OR** caregiver **OR** spouse **OR** partner(title/abstract)		107505
	patient **OR** client **OR** sufferer (title/abstract)		43122
SEARCH WITH **AND**	breast(title/abstract)		110
Medline	cancer **OR** neoplasm **OR** tumor **OR** tumour(title/abstract)		10,202
	support **OR** care **OR** needs **OR** wants **OR** preferences(title/abstract)		26,189
	relative **OR** family **OR** significant other **OR** carer **OR** caregiver **OR** spouse **OR** partner(title/abstract)		1,705
	patient **OR** client **OR** sufferer (title/abstract)		127
SEARCH WITH **AND**	breast(title/abstract)		40
Inclusion Criteria			
Pubmed	Published in English, 2002-2013,		372
CINAHL	Published in English, 2002-2013,		87
Medline	Published in English, 2002-2013,		40
Exclusion Criteria			499
	papers that focusd on treatment objectives, diagnosis, medication regimes,		55
	papers that focused on palliative or hospice care setting,		29
Total papers Selected for review			29
Embase	cancer **OR** neoplasm **OR** tumor **OR** tumour (title/abstract)		3,327,877
	support **OR** care **OR** needs **OR** wants **OR** preferences (title/abstract)		84572
	relative **OR** family **OR** significant other **OR** carer **OR** caregiver **OR** spouse **OR** partner(title/abstract)		352,368
	patient **OR** client **OR** sufferer (title/abstract)		82,731
SEARCH WITH **AND**	breast(title/abstract)		37
Cochrane	cancer **OR** neoplasm **OR** tumor **OR** tumour (title/abstract)		4,516
	support **OR** care **OR** needs **OR** wants **OR** preferences (title/abstract)		4,728
	relative **OR** family **OR** significant other **OR** carer **OR** caregiver **OR** spouse **OR** partner(title/abstract)		1,691
	patient **OR** client **OR** sufferer (title/abstract)		4,062
SEARCH WITH **AND**	breast(title/abstract)		20
Psych Info	cancer **OR** neoplasm **OR** tumor **OR** tumour (title/abstract)		
	support **OR** care **OR** needs **OR** wants **OR** preferences (title/abstract)		
	relative **OR** family **OR** significant other **OR** carer **OR** caregiver **OR** spouse **OR** partner(title/abstract)		
	patient **OR** client **OR** sufferer (title/abstract)		
SEARCH WITH **AND**	breast(title/abstract)		10
			67
Exclusion Criteria	papers that focusd on treatment objectives, diagnosis, medication regimes,		21
	papers that focused on palliative or hospice care setting,		3
Total papers Selected for appraisal review			35

Table 3.1 Illustrating hits achieved (n=35) in database search in PubMed, CINAHL, Medline, Embase, Cochrane and Psych Info. The author further added to this with review of reference list.

Appendix 8 Tables of Articles Identified for the Literature Review.

Paper (Country)	*Design*	*Aim*	*Women*	*Carer/relative*	*Other*	*Tools*	*Conclusion*
Feigin et al., (2000) America	Group session work	To determine the effect of group sessions in women with breast cancer recovering from Autologous Bone Marrow Transplant (AuBMT)	(n=45) Women with breast cancer	-	-	8-10 weekly meetings lasting 90 minutes in duration.	Recovery (from AuBMT) was impacted by psychosocial factors. Among influencing factors social support, family involvement, partner intimacy physical ability, treatment and illness were all associated with recovery time.
Ben-Zur, Gilbar and Lev (2001) Israel	Quantitative questionnaires.	To (1) assess patients with breast cancer and their spouses coping strategies and adjustment to cancer (2) investigate patients' and spouses' coping strategies	(n=73) women with breast cancer and spouses	(n=73) women with breast cancer and spouses	-	Completed questionnaires that measured distress (Brief Symptom Inventory), psychosocial adjustment, and coping strategies.	Patients' distress was greater than their spouses', but a similar level of psychosocial distress was found in both. Coping, which included avoidance strategies, was highly related to distress and poorer adjustment overall.
Gale et al., (2001) UK	Questionnaire measures	To investigate whether existence of a cohabiting relationship and its quality was related to psychological distress in women facing an acute stressor—a health threat	(n=158) women with symptomatic breast problems referred to a diagnostic one-stop breast clinic	-	-	Global Measure of Perceived Stress (GMPS; Cohen et al., 1983); Significant Other Scale (SOS; Power & Champion, 1992) was used to measure social support; short version of the Culture Free SEI Self-Esteem Inventories for Children and Adults (Battle, 1981); The Dyadic Adjustment Scale (DAS; Spanier, 1976)	Women in low quality relationships experienced significantly more distress and received less support than women in high quality relationships. Women with self-rated poor quality spousal relationships are at risk of elevated psychological morbidity in the context of investigation for suspected breast disease
Coristine et al.,(2003) Canada	Qualitative	To describe psychosocial impact on caregivers of caring for women with advanced breast cancer	-	(n=18) 12 Spousal caregivers. 6 Non spouse caregivers	-	5 focus groups with qualitative content analysis carried out on the transcripts.	The responsibility and need to protect the woman with breast cancer was a common theme among caregivers. The physical toll of caring and time involved were found to put carers at risk for psychosocial factors.

Paper (Country)	***Design***	***Aim***	***Women***	***Carer/relative***	***Other***	***Tools***	***Conclusion***
Ganz,et al., (2003), America	Quantitative	To observe significant declines in the physical and mental health of older women in the 15 months after breast cancer diagnosis	(n=691) women over 65 years with breast cancer	-	-	cancer-specific psychosocial quality of life measure	Findings indicate that older women with impaired; physical functioning, mental health, emotional and/or social support after surgery have poorer outcomes
Inoue et al., (2003) Japan	Cross sectional	To investigate the relationship between breast cancer patients coping responses to diagnosis of cancer and their family functioning	Post-operative women with breast cancer (n=46) and spouses	Post-operative women with breast cancer (n=46) and spouses	-	Family Assessment Device (FAD) and Mental Adjustment to Cancer Scale (MAC)	Poorer family communication was linked with increased levels of hopelessness/helplessness. Higher educational level linked with low fight spirit. Healthcare Professionals should devote attention to the patient but also other family members.
Lethborg et al.,(2003) Australia	Qualitative using interviews	To describe experience of significant others of women with breast cancer	-	(n= 8) Significant others of women with breast cancer	-	4 Open ended questions asked, significant others allowed to elaborate. Audio-taped.	There is a need for women with breast cancer to be supported by their wider circle than spouse alone this can have benefits for patient and partner. Significant others require support structures also.
Nikoletti et al., (2003) Australia	Quantitative Descriptive correlational survey	To determine the (1)information needs (2) unmet needs of primary family caregivers of women having breast surgery	-	(n=141) carers n=98 partners n=27 daughters n=6 sister/mother n=5 son n=5 other carer	-	Modified Family Inventory of Needs. Mild Behavioural Style Scale (MBSS).	There is a need for information delivery to be in an honest, reassuring manner. Carers need to be informed of care aspects, as they also have needs in relation to information.
Grunfeld et al., (2004) Canada	Quantitative	To prospectively examined the psychosocial, occupational and economic impact of caring for a person with a terminal illness	-	(n=89) caregivers of women with advanced breast cancer	-	self-administered questionnaire	Caregivers' depression and perceived burden increase as patients' functional status declines. Strategies are needed to help reduce the psychosocial, occupational and economic burden associated with caregiving

Paper ***(Country)***	**Design**	**Aim**	**Women**	**Carer/relative**	**Other**	**Tools**	**Conclusion**
Manne et al., (2004) America	Observational methodology with sequential analysis	To examine the association between couple communication about cancer and psychological distress and relationship satisfaction of women with breast cancer.	(n=148) Women and partner	(n=148) couples Partook in videotaped discussion of cancer issue and general issue	-	10 minute discussion of cancer topic 10 minute discussion of mutually agreed relationship problem	Partners play a significant role in the woman's adaption to breast cancer General distress of woman when attempted to solve problems was also highlighted during the dilemma stage.
Sandgren et al., (2004) America	Quantitative	To compare judgments made by breast cancer patients and a confidant about the QOL of the patients	(n=112) participants and their confidants	(n=112) participants and their confidants	-	FACT (FACT-GP and FACT=-B) Measures of worry utilising a Likert scale	Confidants may overestimate how distressed patients feel, or that patients are reluctant to admit to distress. Such discrepancies could cause misguided social support efforts
Carlsson et al., (2005) Sweden	voluntary action perspective interview study	To explore how women with breast cancer experienced their contact with a contact person from a patient associations for breast cancer patients	(n=8) women with breast cancer and breast cancer survivors as contact	-	-	Audio-taped narratives from 8 women were analysed using Reissman's monitoring and Gee's analysis structure.	Three themes appeared: 1. Shared experiences give new perspectives on having cancer, 2. Feelings of isolation are a part of the identity of the illness and 3. Relations with others enable self-help.
Manne et at., (2005) America	Longitudinal study Focus groups randomly controlled	To examine the efficacy of a couple-focused group intervention on psychological adaptation of women and evaluated whether perceived partner unsupported and patient functionality moderated intervention	(n=238) Women and partner	(n=238) women with breast cancer and their partners randomly assigned to 6 couple focused sessions or usual care	-	Pre intervention questionnaire group randomly assigned to control or test sample Assessed 1 week and 6 months post group sessions.	Focus groups can enhance emotional and psychological wellbeing of women with breast cancer. A lack of support was correlated with increased psychological ailments
Northouse et al., (2005) America	Prospective longitudinal randomized clinical trial	To determine if patients with advanced breast cancer and their family caregivers, who participated in a family based intervention, report better QOL	(n=134) Women and carers	(n=134) patients and caregivers assigned to usual care (control) or to usual care plus intervention (experimental)	-	Intervention used	Findings suggest that family intervention group reported significantly less hopelessness and less negative outcomes. Higher quality of life sores were also associated with women caregivers who partook in the intervention

Paper *(Country)*	Design	Aim	Women	Carer/relative	Other	Tools	Conclusion
Wimberly et al., (2005) America	Two studies were conducted, cross sectional and longitudinal	To demonstrate that patients' wellbeing was strongly related to the positive emotional involvement of their partners.	(n=170) women with breast cancer	-	-	Study 1; scales Study 2;Data was collected repeatedly over a year: at 3, 6, and 12-month in interviews	Demonstrated that patients' wellbeing was strongly related to the positive emotional involvement of their partners.
Mayer & Grober (2006) America	Survey	To assess the needs of women with Advanced Breast Cancer	(n=618) women with breast cancer	-	-	64 question online survey	Report high levels of support and support-seeking. Seek support not only when they are feeling anxious or sad, but also when they need help coping with their disease.
Forrest et el., (2006) America	Qualitative interview study with thematic analysis	To explore how children of mothers newly diagnosed with breast cancer perceive their mother's illness	(n=37) Mothers with early breast cancer and 31 of their children aged between 6-18 years.	(n=37) Mothers with early breast cancer and 31 of their children aged between 6-18 years.	-	Interviews (semi-structured)	Women with breast cancer with a life threatening illness need to be supported with regard to talking to their children. Children also need support specifically if physical alterations present as these were deemed as being the most distressing.
Arora et al., (2007) America	Quantitative surveys	To evaluate helpfulness of informational, emotional and decision-making support.	(n=246) Women Controls(n=125) and tests (n=121)	-	-	Analyses of data using Comprehensive Health Enhancement Support System (CHESS)	Helpfulness of information, emotional needs and decision making, were identified as key factors for women with breast cancer.

Paper *(Country)*	Design	Aim	Women	Carer/relative	Other	Tools	Conclusion
Hinnen et al., (2007) The Netherlands	Longitudinal study design	To study distress, neuroticism and time since diagnosis as determinants of support behaviour (i.e. protective buffering and active engagement)	-	(n=92) Partners of women with cancer	-	Hospital Anxiety and Depression Scale (HADS), Eyseneck Personality Questionnaire (EPQ) Support assessed with 13 item 5 point Likert scale.	Results indicate small but significant decreases in protective buffering and active engagement over time. Moreover, initial distress and neuroticism were associated with buffering.
Kim et al., (2007) America	Quantitative	To examine caregivers@ gender and relationship to cancer survibvors of plausible predictors of their appriaisals.	-	(n=448) spouses and offspring of individuals with cancer	-	-	Male spouses were more likely to see caregvining as self-esteem boosting, female spouses were more prone to stress and negatiove outlooks as well as reduced QOL.
Luszczynska et al., (2007) Berlin	Quantitative	To examine emotional support provided by intimate partners and received by men and women	173 couples , 224 significant others, 173 (77%) were intimate partners	(n=173) couples 224 significant others, 173 (77%) were intimate partners	-	Berlin Social Support Scales (BSSS; Schulz &Schwarzer, 2003) 6 Item Emotional Support questions devised by researchers were used to assess	Alternative sources of support, in particular for women, such as their network of friends or professional help, need to be identified.
Bergelt et al., (2008) America	Quantitative Survey	To investigate the quality of life(QOL) in partners of individuals with different cancer types and examine potential predictors of QOL	-	(n=373) partners of individuals with cancer including breast cancer	-	Quality of Life (SF-36QOL) Questionnaire	The QOL of the partner of the woman with breast cancer is affected mentally more so than physically by the diagnosis.
Budin et al., (2008) America	randomized controlled clinical trial intervention	To conduct a randomised controlled clinical trial of phase-specific evidence based psycho-education and telephone counselling interventions	(n=249) patient-partner dyads were assigned randomly to one of four groups: (a) control (b) standardized	(n=249) patient-partner dyads were assigned randomly to one of four groups: (a) control (b) standardized	-	Intervention of standardised versus control group	Patients showed poorer adjustment over time in the control group than to those receiving interventions

Paper *(Country)*	Design	Aim	Women	Carer/relative	Other	Tools	Conclusion
Manne et al., (2008) America	Quantitative surveys	To evaluate the role of cognitive and social processing in partner psychological adaptation to early stage breast cancer.	-	(n= 253), Partners of women with early stage breast cancer 9 months (n = 167), and 18 months (n = 149).	-	Completed measures of acceptance, meaning-making, and general and cancer-specific distress.	Lower satisfaction with partner support predicted greater global distress, and greater use of positive reappraisal.
Manne et al., (2009) America	Quantitative questionnaire	To evaluate the role of cognitive and social processing in partner psychological adaptation to early stage breast cancer, evaluating both main and moderator effect models	-	Partners of women with early stage breast cancer evaluated shortly after the womans diagnosis (n= 253), nine (n = 167), and 18 months (n =		Partners completed measures of emotional expression, emotional processing, and acceptance, meaning-making and general and cancer-specific distress.	Lower satisfaction with partner support predicted greater global distress, and greater use of positive reappraisal was associated with greater distress.
Emery et al., (2009) America	5 year longitudinal study conducted follow-up investigations	To assess the determinants of physical activity among women with breast cancer.	(n=227) Stage II and III women with breast cancer	-		evaluations conducted every 4 months during first year and every 6 months during next 4 years (12 assessments in total)	Women with greater social support showed slower decline in physical activity overtime. The QOL of women with greater support was also higher.
Sherman et al., (2009) America	Secondary data analysis	To assess the degree to which post- surgical adjustment in patients with breast cancer and their significant others depend on the nature of the patient-partner dyad relation-ship	(n=205) patient-partner dyads 112 intimate 54 family 35 non-familial	(n=205) patient-partner dyads 112 intimate 54 family 35 non-familial		Random control trial (RCTs)	The patient – partner dyad needs to be considered .Women breast cancer were found to experience successful physical and emotional adjustment when dyad present.
Sjovall et al., (2009) America	Quantitative	To examine the healthcare use and healthcare cost on partners of persons with cancer	-	(n=11,076) partners completed questionnaires pre and post diagnosis		Questionnaires	The psychological effect of cancer on the partner can be huge, increase in issues such as financial and healthcare cost post diagnosis of cancer can have significant impact on the health of significant other

Paper ***(Country)***	**Design**	**Aim**	**Women**	**Carer/relative**	**Other**	**Tools**	**Conclusion**
Bailey et al., (2010) America	Quantitative	To determine whether caregiving roles associated with risk of elevated depressed mood over 1 year both patients' and controls.	(n=1,096) female patients	-	-	Centre for Epidemiologic Studies Depression (CES-D) survey [22] to measure depressed mood	Patients with multiple caregiving roles were more likely to be depressed while controls were less likely to report elevated depressed mood.
Dorros et al., (2010) America	Quantitative	To test whether interdependence in dyads of partners and patients with breast cancer could lead to crossover effect in distress outcomes	(n=95) dyads early breast cancer patients and their partners	(n=95) dyads early breast cancer patients and their partners	-	Structural equation model of actor-partner interdependence model to examine interaction	Increase psychological issues in patients correlated with an increase in physical issues for their partners.
Fletcher et al., (2010) America	Cross-sectional and longitudinal	To describe spouses' reported cancer-related demands attributed to their wife's breast cancer and to test the construct and predictive validity of a brief standardized measure of these demands.		(n=151) spouses of women newly diagnosed with non-meta-static breast cancer	-	33-item short version of the standardized measure of cancer demands demonstrated construct 123-item questionnaire	Concerns about: spouses' functioning; wife's wellbeing and response to treatment; as well as couples' sexual activities; the family and children's wellbeing; and the spouses' role in support were identified.
HassenOhayn et al., (2010) Israel	Quantitative questionnaires	To examine effect of perceived support from different agents on psychological distress experience women with advanced breast cancer and spouses	(n=150) couples of women and their partners	(n=150) couples of women and their partners	-	Cancer Perceived Agent of Support Questionnaire, Brief Symptom Inventory Scale	Psycho-social support is more efficacious when available from several sources i.e. family spouse, friends etc. Psychological distress was lower in couples reporting higher support levels.
Northouse et al., (2010) America	Meta-analysis was used to analyse data from 29 RCT	To analyse the types of interventions offered to family caregivers of cancer patients, and to determine the effect of these interventions	-	-		(n=29) studies of randomized clinical trials between 1983 and March of 2009	Interventions had small to medium effects, significantly reduced caregiver burden, improved caregivers' ability to cope, and improved quality of life.

Paper (Country)	***Design***	***Aim***	***Women***	***Carer/relative***	***Other***	***Tools***	***Conclusion***
Sawin (2010) America	Qualitative Semi-structured interviews	To describe the experiences of older rural women diagnosed with breast cancer while in a non-supportive, and sometimes abusive, intimate relation-ship	(n=9) rural women with breast cancer	-	-	hermeneutic phenomenological analysis, Survey, Women's Experience With Battering (WEB) Scale	Women with breast cancer identified driving, gossip, and community support as therapeutic, Women with less supportive partners had greater problem areas and higher incidences of stress overall.
Vahdaninia et al., (2010) Iran	prospective study	To investigate psychological distress in patients with breast cancer following completion of breast cancer treatments and to determine its associated factors.	n=167 women with breast cancer	-	-	Hospital Anxiety and Depression Scale at: baseline (pre-diagnosis), 3 months after treatment and 1 year after completion of treatment	Levels of anxiety and depression decreased over time, a significant number of women had elevated anxiety and depression at the 18 months follow-up.
Zahlis and Lewis (2010) America	Qualitative Face-to-face interviews	To examines the experience of spouses newly diagnosed with breast cancer	-	(n=48) spouses study sample from larger clinical trial	-	20-45 minute open ended questions interviews taped	The feeling of being “nailed by cancer” “the cancer changing us” and “taking care of us” As well as “making things work” were expressed by spouses.
Belcher et al., (2011) America	Internet based electronic diary	To examine the links between breast cancer patients report of receiving support from spouse and spouses reports to providing support	45 women and spouses	(n=45) women with early stage breast cancer and spouses		Kept diary for 7 consecutive nights analysed with multilevel modelling	Women and their spouses identified the need for support and the link to relationship intimacy. As well as the benefit of being in a relationship, having support was also evident.

Paper (Country)	*Design*	*Aim*	*Women*	*Carer/relative*	*Other*	*Tools*	*Conclusion*
Levy et al., (2011) Israel	Two support groups	To describe support groups and discusses various patterns that emerged in couples' relationship and the manner group dealt with it	-	(n=7) Partners of women throughout disease trajectory 2 unmarried	-	15 ½ hour weekly meetings, 7 in first 5 in 2nd who also took part in first	Spouses' perception of illness as the need for man to be strong. Protector ship, need of partner to be strong, vs weak, inability of male spouses to cope with emotional aspects were observed.
Preau et al., (2011) France	Cross sectional	To determine characteristics of patients who reported a strengthening of their couple relationship 2 years after cancer diagnosis	3,221 participants who were living with the same partner since diagnosis, 32.8% of men and 41.5% of women	3,221 participants who were living with the same partner since diagnosis, 32.8% of men and 41.5% of women	-	Phone interviews	Importance for healthcare workers to provide adequate information and psychological support to couples facing a cancer diagnosis.
Cheng, et al., (2012). Taiwan	Prospective longitudinal study.	To examine changes in quality of life among patients with breast cancer and factors related to it, during the first three months after diagnosis.	(n=61) women with breast cancer	-	-	Functional Living Index-Cancer, Symptom Distress Scale, the Self-Efficacy Scale and a 0-10 Anxiety Numeric Rating Scale.	Fatigue, limited shoulder function and perceived poor appearance were the most significant factors predicting changes of quality of life in women with breast cancer.
Chou et al., (2012) America	Quantitative	To examine the relationship between social support and survival among women diagnosed with breast carcinoma,	(n= 584) Women with breast cancer were followed for up to 12.5 years			Medical Outcomes Study (MOS SF-36) scale, Berkman-Syme Social Network Index (SNI)	Increased contact with friends/family post-diagnosis was associated with lower risk of death, Social connectedness acts as information digression and a decision support network.

Paper (Country)	Design	Aim	Women	Carer/relative	Other	Tools	Conclusion
Korziinska *(2012)* *Italy*	Quantitative	To demonstrate the importance of attachment in the assessment of health and in life satisfaction of women with breast cancer.	Two groups were formed: study group (128 women with breast cancer) and control group (112 women without any psychiatric or serious somatic illness).	-	-	Relationship Questionnaire, Physical Disposition Scale, Subjective Health Scale, The Satisfaction with Life Scale.	In women with breast cancer compared with controls: 1) insecure attachment was more frequent, 2) physical wellbeing and subjective health were statistically significantly at a lower level, 3) subjective health and life satisfaction were at the highest level in women with secure attachment, regardless of the presence or absence of breast cancer
Pauwels et al., *(2012)* *Belgium*	Cross sectional design	To examine psychosocial characteristics associated with breast cancer survivors partners	-	(n=84) Partners of women after breast cancer treatment had to be in intimate relationship before cancer diagnosis	-	Published questionnaires	There is a need to take note of the emotional needs of partners of women with breast cancer. Additional information needs to be provided for women with breast cancer with greater symptoms and more emotional distress.
Probst et al., *(2012)* *Switzerland*	hermeneutic phenomenology interviews	To explore the experiences of carers who care for a loved one with a fungating wound	-	(n=7) carers n=5 partners n=1 mother n=1 daughter	-	55-95 minute interviews open ended questions taped	Burden of care, affect to daily life ,increase in workload, stress and need for holistic approach to care were all highlighted as being significant factors in the experience of dealing with a fungating wound.

Paper (Country)	Design	Aim	Women	Carer/relative	Other	Tools	Conclusion
Northouse et al., (2013) America	Quantitative	To examined if patient–caregiver dyads assigned to a brief or extensive dyadic intervention had better outcomes than dyads assigned to usual care	(n=302) dyads of patients and partners	(n=302) dyads of patients and partners	-	Pre and post intervention (3-6 months Questionnaire, Risk of Distress Scale.	Brief and extensive programmes can have an impact on the relational aspect of cancer patients' partners. Patients and caregivers may need basic resources overtime to help with better outcomes.
Pinkert et al., (2013) Germany	Descriptive cross sectional	To survey the needs of relatives of breast cancer patients and their current level of satisfaction, To ascertain which needs perceived by nurses as important.		(n=242) relatives- 65.5% spouse, 17.9% child, friends 4.3% other(mother/father/sister/brother/in laws) 10.3% 356 nurses		Critical Care Family Needs Inventory Needs Met Inventory adapted as translated into German 24 question 4 point Likert scale	There is a need for information and integration into care process for significant others of women with breast cancer.
Bradley and Dahman (2013) America	Quantitative Survey	To estimate the effect of cancer and its treatment on employment and weekly hours worked for employed men whose wives were newly diagnosed with breast cancer.	-	-	- n=373 husbands of women with breast cancer compared with men from non-cancer control group	Survey with questions relating to employment, hours worked, any decrease in weekly hours worked, and change in weekly hours from pre-diagnosis to 2 and 9 months following treatment.	Breast cancer treatment had a small, negative effect on work outcomes in employed husbands of affected women.

Paper (Country)	***Design***	***Aim***	***Women***	***Carer/relative***	***Other***	***Tools***	***Conclusion***
Fagundes et al., (2014) America	Quantitative	To examine how individual attachment style and self-regulatory capacity were associated with quality of life among post-treatment breast cancer survivors.	Women with breast cancer n = 96	-	-	Electrocardiography (ECG) Close relationships Scale, and the Functional Assessment of Cancer Therapy-Breast scale.	A better understanding of how attachment style and RSA contribute to breast cancer survivor QOL will help identify people at risk for QOL problems after treatment completion.
Hsiao et al., (2014) Taiwan	Quantitative	To explore whether stress from individual's and partner's depression, anxiety, sleep disturbances, insecure attachment and meaning in life were predictors of diurnal cortisol patterns in breast cancer survivors and their spouse	n=34 couple dyads participated in this eight-month follow-up study	n=34 couple dyads participated in this eight-month follow-up study	-	Medical Outcomes Study Sleep scale, the Beck Depression Inventory-II, the State Trait Anxiety Inventory, the Experiences in Close Relationships – Revised scale and the Meaning in Life Questionnaire, and they collected salivary cortisol	For spouses, stress responses are mainly influenced by breast cancer survivors' insecure attachment. Future couple supportive care interventions can address survivors' attachment styles in close relationships in order to improve neuroendocrine functions for both breast cancer survivors and their spouses.
Lim (2014) America	descriptive cross-sectional methodology with both quantitative (survey) and qualitative methods	To understand the dyadic relationships between family communication and quality of life (QOL) and coping and Chinese-American and Korean-American breast cancer survivor (BCS)–family member dyads	n=32 Chinese-American and Korean-American BCS–family member dyads	n=32 Chinese-American and Korean-American BCS–family member dyads	-	Medical Outcome Study SF-36,Family Crisis Oriented Personal Evaluation Scale (F-COPES), the Family Adaptability and Cohesion Evaluation Scale IV—Family Communication Scale,	Chinese-American and Korean-American BCS and their family members may benefit from interventions that enhance communication and coping within the family unit.

Appendix 8(a) Table Representing Articles by Design

Design	Number n=49
Qualitative	n=15
Quantitative	n=26
Mixed Methodology	n=2
Randomised Control Clinical Trial	n=6

Appendix 9 Table Representing Appraisal Tools Assessed

Name	Developers	Details	Pros	Cons	Comments
The Scottish Intercollegiate Guidelines Network (SIGN 50)	Academy of Royal Colleges and their Facilities in Scotland 1993	The SIGN 50 which aims to assess good quality guidelines to assist practitioners.	Provided good guidelines to assess if article applicable to study	Does not give measurable means by which to assess article.	The tool were more of a set of guideline as oppose to providing the criteria for accepting the article for the review
READER tool	MacAuley, 1994 .	This tool provides a sequence of steps that can be used in general practice to assess the quality of literature. Includes four steps using the acronym of READ. Article is appraised on a scale with R representing relevance (scored 1-5), E denoting education (scored 1-5), A for applicability (scored 1-5) and D for discrimination (scored 1-10). A score of 24 or more indicates a highly topical article that has potential for huge impact. A score of 20-23 qualifies as necessary reading and potentially valuable. Scoring 15-19 suggests that the paper may contain a level of interest but not essential A score of 15 or less suggest that paper has failings and to disregard	This tool did provide a good outline basis to literature.	It was found to be lacking in relation to quantifying credibility and validity of papers. A paper may have value but fall short of meeting the criteria due to its inability to be applied in practice.	It is predominantly focused on the adaption of the paper to the clinical setting and so overly reliant on papers that lend themselves to this easily as oppose to critically appraising the work.
The STARD tool	Standards for Reporting of Diagnostic Accuracy (STARD) committee	Tool acts on a system of reporting on the paper. It catalogues sections and topics getting the user to state each item.	This was found to be useful for outlining articles	Tool did not provide measurable means by which to determine if the studies were acceptable.	Unable to provide scores to papers at end of appraisal tools usage. Not suitable as required more than outline of paper.
The McMaster Tool of Critical Review	Law, Stewart, Pollock, Letts, Bosch and Westmorland, 1998	McMaster Critical Review Form for Qualitative studies contains a generic quantitative appraisal tool, accompanied by detailed guidelines for usage	Tool was useful for quantitative studies	Tool was found lacking when applied to qualitative literature.	As a high majority of the literature on women with breast cancer and their significant others appears qualitative this would be unsuitable.
The Evaluation Tool for Mixed Methods.	Long, 2005	Tool provides overview criteria of article. Developed from the evaluation tools for quantitative' and qualitative studies. The mixed method tool draws on appropriate questions from the quantitative and qualitative tools. It provides a template of key questions	Beneficial in gaining information about article and assessing the aims/ methods and conclusions of papers.	Only applicable to mixed method studies	Is beneficial, though was only seen as applicable to studies that used mixed methods. As some studies were solely quantitative and others solely qualitative for this review was impractical.
EBL Critical Appraisal Checklist.	Glynn, 2011	This tool using mathematical calculation quantified the validity of papers. Is deemed to be of a high calibre.	Used extensively in literature.	More favourable to quantitative studies.	Its uses were seen to be favourable to quantitative studies, specifically randomised controlled trials and adaption would need to be adopted for qualitative studies.
The AGREE II Instrument (Brouwers et al., 2010).	AGREE Research Trust, May 2009	The tool consisting of 23 items and 6 domains is widely published and provides explicit information on the article, comprising a mass of information	Uses scoring system. Acts more like an assessment where the user can chose which papers to include.	The tool uses a scoring system but states that within the domains there is no set score for good or poor papers rather it allows the user to recommend the paper or not	This tool was found to be too liberal as it allowed the final judgement of inclusion to be made by the user.

Appendix 10 QualSyst Appraisal Tool

Checklist for assessing the quality of quantitative studies

1 Question / objective sufficiently described?
2 Study design evident and appropriate?
3 Method of subject/comparison group selection or source of information/input variables described and appropriate?
4 Subject (and comparison group, if applicable) characteristics sufficiently described?
5 If interventional and random allocation was possible, was it described?
6 If interventional and blinding of investigators was possible, was it reported?
7 If interventional and blinding of subjects was possible, was it reported?
8 Outcome and (if applicable) exposure measure(s) well defined and robust to measurement / misclassification bias? Means of assessment reported?
9 Sample size appropriate?
10 Analytic methods described/justified and appropriate?
11 Some estimate of variance is reported for the main results?
12 Controlled for confounding?
13 Results reported in sufficient detail?
14 Conclusions supported by the results?

Checklist for assessing the quality of qualitative studies

1 Question / objective sufficiently described?
2 Study design evident and appropriate?
3 Context for the study clear?
4 Connection to a theoretical framework / wider body of knowledge?
5 Sampling strategy described, relevant and justified?
6 Data collection methods clearly described and systematic?
7 Data analysis clearly described and systematic?
8 Use of verification procedure(s) to establish credibility?
9 Conclusions supported by the results?
10 Reflexivity of the account?

Key: For each of the above the score is either yes=score 2 partial yes=score 1 no=score 0 or N/A for non-applicable questions discount that question from total number of questions (Kmet, Lee and Cook, 2004).

Appendix 11 Instruments Evaluated for the Study

Instrument	Measurement	Description	Pros	Cons
EQ-5D	*Health Related Quality of Life*	Intended to develop a generic currency for health that could be seen as common across Europe. The original version had 14 health states in six different domains. More recent versions, known as the EQ-5D, are now in use in a substantial number of clinical and population studies.	Most commonly used in the European community. Been advanced by a collaborative group from known as the EuroQol group (international, multi-disciplinary researchers).	Not used widely and extensively
Quality of Well-Being Scale (QWB-SA)	*Health Related Quality of Life*	Self-administered form. The QWB-SA combines preference-weighted values for symptoms and functioning. Symptoms are assessed by questions that ask about the presence or absence of different symptoms or conditions.	Has been used in numerous clinical trials and studies over the years to evaluate medical and surgical therapies in conditions such as chronic obstructive pulmonary disease	Focus is on disease or conditions to retain QOL, not specifically concerned with how other factors such as relationships, diet, physical activity may influence QOL
ECOG QOL-30	*Health Related Quality of Life*	Devised by Eastern Cooperative Oncology Group (ECOG). Most commonly used to evaluate the impact of cancer on sufferers.	Is applicable to cancer specific needs in relation to QOL	Specific to cancer but not breast cancer solely
CDC HRQOL http://www.cdc.gov/hrqol/methods.htm	*Health Related Quality of Life*	Uses a set of questions called the "Healthy Days Measures. Assesses in the past 30 days how participants rate measures of physical and mental wellbeing.	Used by Centre for Disease Control. Is part of the Behavioural Risk Factor Surveillance System (BRFSS)	No measure for emotional and social factors on health/wellbeing
RAND-36 http://www.rand.org/pubs/permissions.html	*Health Related Quality of Life*	Most widely used health-related quality of life (HRQoL) survey instrument in the world. Comprised of 36 items that assess eight health concepts: physical functioning, role limitations caused by physical health problems, role limitations caused by emotional problems, social functioning, emotional wellbeing, energy/fatigue, pain, and general health. Physical and mental health summary scores are provided.	Assesses numerous health elements including functional, physical, emotional, mental and social. Available in multiple languages and validated for use in 45 countries Very comprehensive form of QOL elements	Application to general chronic conditions/diseases, is quite long and extensive, may take substantial amount of time.
FACT-B/FACT-GP (Version 4) (FACIT.org)	*Quality of Life*	Contains a list of statement that participants rate as applicable to them in past 7 days.	Applicable to a variety of cultures (Pandey, Thomas, Ramdas, Eremenco and Nair, 2002). sensitivity was found satisfactory cross-cultural relevance of the tool	Short period of time to complete, specific the breast cancer but has version suitable for use with general population.

Instrument	Measurement	Description	Pros	Cons
DAS DYADIC ADJUSTMENT SCALE (DAS)	*Dyadic Adjustment*	A 32-item measure of relationship quality. The scale is divided into 4 subscales: (1) Dyadic Consensus – degree to which respondent agrees with partner (2) Dyadic Satisfaction -- degree to which respondent feels satisfied with partner (3) Dyadic Cohesion –degree to which respondent and partner participate in activities together (4) Affectional Expression – degree to which respondent agrees with partner regarding Emotional affection.	Considers the dyadic relationship which is the key focus of the study. Acceptable internal consistency, although lower than those originally reported by Spanier (1976)	Only provides measurement of couple adjustment i.e. as an intimate relationship literature however stated that the Significant Other of the woman may not be an intimate partner so certain elements of the scale would not be applicable to them. The Affective Expression subscale was found to produce scores with poor Cronbach's alpha across studies
PAIS (Psychological Adjustment to Illness Scale)	*Adjustment to Disease*	Multidimensional semi-structured interview that assesses psychological and social adjustment.	Relates adjustment to condition/illness.	Is an interview based tools for this study the focus is on scales that provide measurement values.
Mental Adjustment to Cancer Scale (MAC)	*Adjustment to Cancer*	It is a 40-item self-report questionnaire that evaluates coping with illness with five subscales: fighting spirit, helplessness/hopelessness, anxious preoccupation, fatalism and denial/avoidance.	Is specific to adjustment to cancer. Assesses broad components of adjustment. Used widely to assess adjustment to cancer. Have relatively high internal consistency's and reliability values.	Adjustment to cancer only and not specific to breast cancer.
FACIT (Functional Adjustment to Illness Therapy)	*Adjustment to Illness*	Measures 4 domains of quality of life: physical, functional, social/family, emotional wellbeing	Provides overview of 4 domains giving wide explanations	Focus on illness therapy and condition
Perceived Stress Scale (PSS)	*Stress*	Self-assess questionnaire 10 item Likert scale (0-4).	widely used tool in the assessment of psychological stress	Measures perceived stress
Depression Anxiety (DASS)	*Depression Anxiety and Stress*	Self-assess questionnaire	**Used for depression and anxiety and is a self-report.**	Does not evaluate emotional distress
Hospital Anxiety and Depression Scale (HADS)	*Depression Anxiety and Emotional Distress*	Self-assess questionnaire is a 14 item tool where respondents rate between 0-3, ggenerating ordinal data.	The anxiety and depression components are categorized separately.	

Instrument	Measurement	Description	Pros	Cons
Satisfaction Subscale from Investment Model Scale	*Satisfaction*	Assess the amount of positive versus negative effects that an individual experiences in a relationship are and to what degree the partner of the individual fulfils their needs	Consists of five items assessing satisfaction at a global level. Reliability of the scale (Cronbachs Alpha) is ranged between 0.92 and 0.95	Has very few items (only 4) that assess relationship satisfaction
Commitment Measure Subscale from Investment Model Scale	*Commitment*	Consists of seven items answered on an 8-point Likert Scale	Measures the level of investment each party has in the relationship i.e. the commitment level to each other and the relationship.	Has small number of items- only 4. Usually used within the Investment Model and not alone although can be utilised this way.
Berlin Social Support Scales (200)	*Support*	Measures support receipt and support seeking behaviours with a 4 point Likert scale assesses perceived emotional support, the need for support, support seeking, actual received support, satisfaction with receipt support, and protective buffering	Contain elements for completion by the support recipient and the support administrator. Assess different aspects of support, actual support, need for support and support seeking	Focus on social support measuring different types of support in terms of social support.
Emotional Intimacy Subscale from the Personal Assessment of Intimacy in Relationships (PAIR; Schaefer & Olson, 1981) scale	*Partner Responsiveness*	Measures 6 types of intimacy emotional, social, sexual, recreational, intellectual and conventional. The measure contains 6 questions for each type of intimacy, each on a 5-point Likert Scale.	Subscale was found to be significant (α = 0.80 [husbands] and 0.84 [wives]).	No specific partner responsiveness scale could be obtained, contains measures of intimacy as this study is looking at non intimate relationships also, potentially not suitable.
The Relationship Scale Questionnaire (RSQ)	*Relationship Style (Attachment Style)*	8-item questionnaire, consisting of a 1-7 Likert scale. Participants rate how well a statement describes their relationship style from strongly disagree to strongly agree.	Extensively used in realm of psychology and sociology. Has 2 components assessing self-indicated attachment style as well as Model of Self/Model of Other i.e. avoidance/anxiety	Contains 8 items so short but is usually completely quite quickly, gives score for Model of Self and Model of Other as oppose to a specific measure of attachment style

Appendix 12 Modified Attachment Diagram for Breast Cancer Context Phase II

Figure 1: Diagrammatic Representation of Bowlbys (1969) Attachment Theory and Pietromonaco et al., (2013) framework as Applicable to the Breast Cancer Context

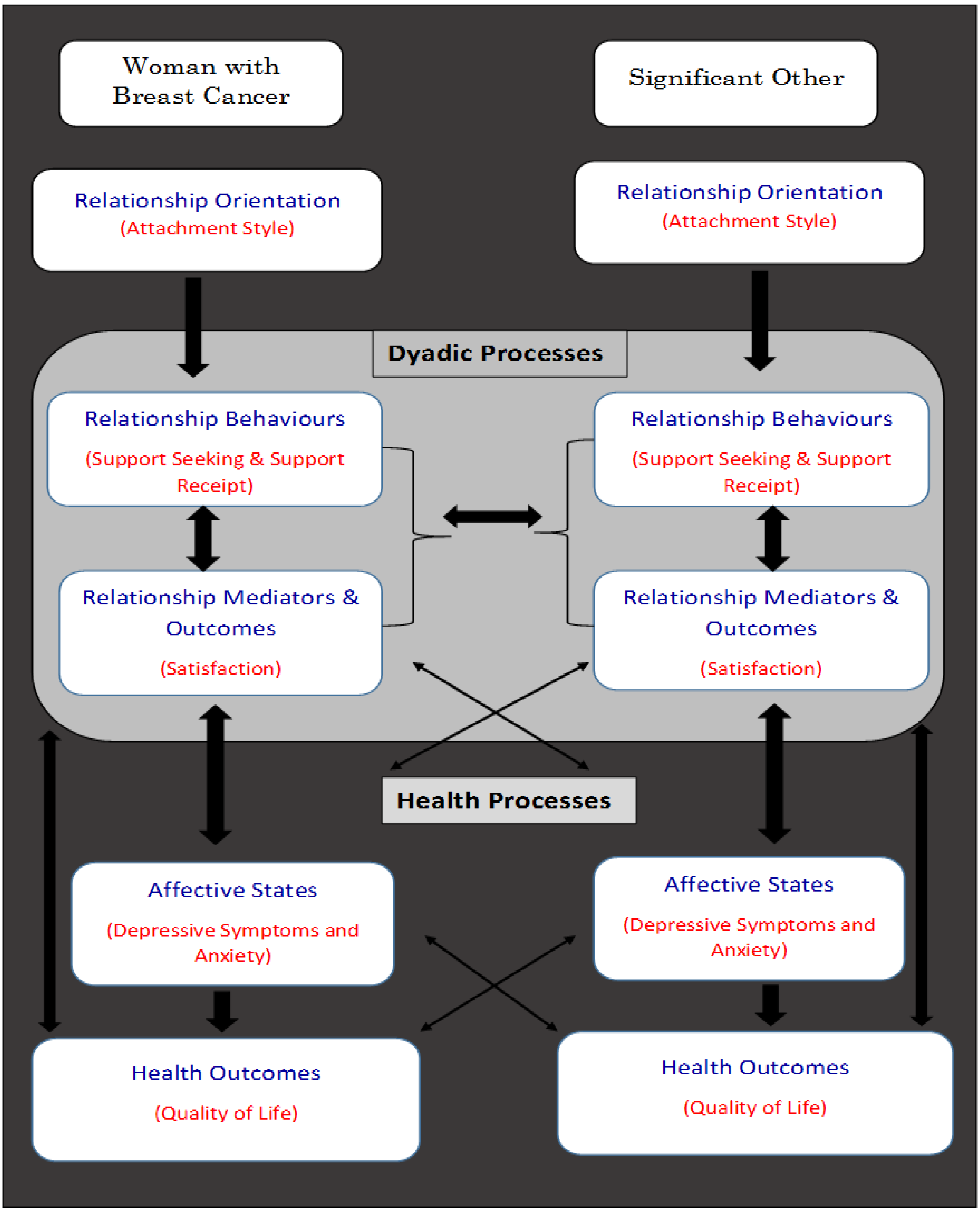


Figure 1: shows the attachment theory framework that was used to guide this study. Arrows depict the direction of the association between each concept. This framework was modified from Pietromonaco et al., 2013 as a result of the literature review. As evident above in Figure 1, the woman with breast cancer (previously Partner A) has her relationship orientation which influences her relationship behaviours, the relationship behaviours are then influence and are influenced by relationship mediators/outcomes. Relationship mediators/outcomes is then influenced by and influences affective states which also influences health outcomes. This is the same process for the significant other (previously Partner B).

Appendix 13 Letter to Copyright for Attachment Theory

XXXXX
XXXXXXXXXXX
School of Nursing and Midwifery
University College Cork,
Western Road,
Cork,
Ireland.

Tavistock Institute of Human Relations,
30 Tabernacle Street,
London EC2 A4UE
EMAIL: hello@tavinstitute.org

To Whom It May Concern,
My name is Ashling Murphy. I am currently undertaking my PhD in Nursing Research in University College Cork, Ireland. My thesis title “Influence of Dyadic Processes on the Health and Disease Outcomes of Women with Breast Cancer and their Identified Significant Other” is a proposed study exploring the relationship aspects between women with breast cancer and their supportive person. As part of my thesis I want to utilize a theoretical framework on which to base my research. I have extensively researched John Bowlby’s work on Attachment Theory and I am very interested in using it to support my own work.

My thesis is examining the relationship that exists between the woman with breast cancer and their supportive people in their lives throughout the diagnosis. The study aims to explore the influence of relationships on health outcomes for this population. The theory would be applied to further explore this relationship and categories it into explainable themes. Attachment Theory and its properties would be highly useful in my research as it deals with the nature of forming human bonds. The theory would be used as a supportive framework for the scope of my thesis. The theory would be referenced accordingly in my academic work. Any further replication of the theory would be unnecessary outside the thesis document.

I am writing to you to ask permission for the use of the Attachment Theory which will appear in my thesis on approval of usage. I would greatly appreciate any assistance with the above.

Yours Sincerely,

Appendix 14 Pilot Study: Letter of Invitation to Participant

School of Nursing & Midwifery,
Brookfield Health Sciences Complex,
University College Cork,
Western Road,
Cork.

Dear Madam/Sir,

My name is Ashling Murphy, I am a PhD student in the School of Nursing and Midwifery, University College Cork. As part of my PhD studies I am required to undertake a research study. My area of interest is looking at women with breast cancer and their relationship with their significant other and how this effects their health.

I am inviting you to partake in a pilot study. A pilot is a small pre-test of a larger study that asks participants to give feedback on their experience after they have completed the questionnaire. The purpose of a pilot study is for the researcher to gain an insight into how the actual study may unfold.

If you agree to participate in the pilot study you will be asked to complete a questionnaire (which takes approximately 15-20 minutes) and to answer questions about the questionnaire (5 minutes approximately). Whilst completing the questionnaire please consider the following

- **Is the layout of the questionnaire easy to follow**
- **Are the instructions within the questionnaire clear**
- **Are the questions understandable**
- **Is the answer you want available to you**
-

Your feedback from the pilot study will be used to guide the main study.

You are not obliged to participate in the pilot study as it is completely voluntary.

Thank you for taking the time to read this letter of invitation and considering participation in the pilot study.

Ashling Murphy

PhD Student

Supervisors: Professor Josephine Hegarty (email: j.hegarty@ucc.ie), Dr. Mairin O' Mahony, Dr. Mark Corrigan and Dr. Suzanne Denieffe.

Appendix 15 Questions for Participants in Face Validity Test Post Questionnaire

Below is a list of questions asking you about your experience of completing the questionnaire. Please Tick the answer as appropriate.

Q1: Did you find the questionnaire easy to read? Yes ☐ No ☐

Were the questions clear? Yes ☐ No ☐

If No, please expand:

☐

Q2: Did you understand the instructions?

Yes ☐ No ☐

Were the instructions clear?

Yes ☐ No ☐

If No, please expand:

☐

Q3: Did you understand **all** questions in the questionnaire?

Yes ☐ No ☐

If No, please expand:

☐

You can also mark any question(s) you found difficult on the questionnaire by circling the number of it.

Q4: Did you have enough time to complete the questionnaire?

Yes ☐ No ☐

If No, please expand:

Q5: Were any of the questions difficult to answer?

Yes ☐ No ☐

If Yes, please expand:

Q6: The study is looking at relationships and how these influence health. Do you think the questions adequately address this topic area?

Yes ☐ No ☐

If No, please expand:

Q7: Any further recommendations, suggestions, you wish to include are welcome:

Thanking you for taking the time to complete this.

Ashling Murphy

PhD student

Appendix 16 Face Validity Questionnaire for Peer Reviewers

Below is a list of questions asking you about your experience of completing the questionnaire Please indicate your response by placing a TICK in the box next to the appropriate answer.

Q1: Does the questionnaire adequately address the aim as depicted below?

Aim of Study: The aim of this study is to examine the influence of relationship orientation (attachment style), dyadic processes (relationship behaviours, relationship outcomes) and affective states on health outcomes (quality of life) for women with breast cancer and their identified significant other.

Yes ☐ No ☐

Q2: Does the questionnaire content address the variables as listed below? Place a **TICK** in the box that corresponds with the most suitable response.

Variable	**Adequately addressed well**	**Somewhat Addressed**	**Not adequately addressed**
Demographics			
Relationship Style i.e. relationship orientation/attachment style of the individual			
Support Seeking/Receipt i.e. the individual's way of asking for and receiving support.			
Satisfaction with the Relationship i.e. level of satisfaction that individual has with the relationship			
Emotional and Psychological Wellbeing i.e. Depressive symptoms and anxiety			
Quality of life and health outcomes i.e. the physical wellbeing, social wellbeing, emotional wellbeing and functional wellbeing of the woman with breast cancer and her significant other.			

Q2 (a): Relationship style and health outcomes are the main focus of this study, should any other questions be included that further address these issues?

If Yes, please expand:

Q3: Are the questions clear and unambiguous? Yes ☐ No ☐

If No, please expand:

Q4: Do the questions allow participants to understand the content in the same way?

Yes ☐ No ☐

Q5: Are the instructions clear, unambiguous in nature?

Yes ☐ No ☐

If No, please expand:

Any further comments and/or recommendations are welcome:

Thank you for taking the time to complete this.

Ashling Murphy

PhD Student, UCC

Appendix 17 Rationale for Conducting the Pilot

Main Reason	Sub Headings
Feasibility of Processes: feasibility of the processes that are involved in the main study.	**1. Recruitment rates** -Retention rates -Refusal rates -Failure of success rates **2. Eligibility criteria** -Is it clear who meets the criteria and who does not -Is the criteria too restrictive or sufficient **3. Understanding of study questionnaire** -Do participants provide appropriate answers and/or multiple answers? -Is there evidence that answers have been altered or changed- if so may need to reword question as could indicate misinterpretation.
Resources	**1. Timing** -Length of time to complete survey -Is it taking a long time to read questions -Are participants struggling with comprehending the questions -On observation do participants appear to be spending a significant amount of time on certain areas of the questionnaire? - How much time is it taking to administer the questionnaire- Estimate how much for 500 - Does the investigator have time to perform the task of data collection **2. Impact of Study** -Will study sample size overload the pre-assessment clinic -Are backlogs happening as a result of the study -Are women missing being called for their time slot as a result of completing the questionnaire **3. Materials** -Do participants find the clipboards and completing the survey whilst waiting appropriate. **4. Environment** -Does the clinic do what it is supposed to - i.e. is it providing access to the necessary sample, is there a feasible supply of women with breast cancer.

Management of Data	**1. Data Collection** -What will the researcher do with the data at the pre assessment clinic? -Is it best to store in bag/box file that is kept with the researcher at all times? -Is this possible? -Does the researcher need to consider collecting from a few participants and then storing that data before continuing data collection? -Is there enough room on data collection form for all the data **2. Data Management** -Is there a way of managing the data from the woman with breast cancer and her significant other -Is the system of giving the questionnaire to the woman with breast cancer to give to her significant other feasible and manageable? -Are any important data values forgotten about? -Do data show too much or too little variability **3.Data Analysis** -Are there any potential problems entering data into the computer -Is a statistician required or an assistant -Can data from different sources be matched
Management of Sample	**1. Safety** -Is it safe to conduct the study -Level of distress observed -Are women and their significant other finding it too disorientating at this time -How are women and their significant other dealing with participating in the study? Is it burdensome? **2. Response** -Do women and significant other express a desire to not participate -Do participants respond appropriately to the questionnaire **3. Variance** -Are there disparities between the samples completing the pilot study? -Is there evidence of a generalised sample

Reason why the Pilot study was conducted influenced by Thabane, L, Ma, J, Chu, R, Cheng, J, Ismaila, A, Rios, L, Robson, R, Thabane, M Giangregorio, L, Goldsmith, C. (2010) A Tutorial on Pilot Studies: the What, Why and How. BMC Medical Research Methodology. 10(1) available at http://www.biomedcentral.com/1471-2288/10/1.

Appendix 18 Letter of Invitation to Participants to Take Part in Study

School of Nursing & Midwifery,
Brookfield Health Sciences Complex,
University College Cork,
Western Road,
Cork.

Dear Sir/Madam,

My name is Ashling Murphy, I am a PhD student in the School of Nursing and Midwifery, University College Cork. As part of my PhD studies I am required to undertake a research study. My area of interest is looking at women with breast cancer and their relationship with their significant other and how this affects their health.

Enclosed is an information leaflet about the study and what it involves. Also enclosed is a consent form for completion and signing.

If you agree to participate in the study you will be asked to complete a questionnaire (which takes approximately 15-20 minutes) and return it via post back to the researcher using the pre-addressed postage paid envelope.

You are not obliged to participate in the study as it is completely voluntary.

Thank you for taking the time to read this letter of invitation and considering participation in the study.

Ms. Ashling Murphy

PhD Candidate

Supervisors: Professor Josephine Hegarty (email: j.hegarty@ucc.ie), Dr. Mairin O' Mahony, Dr. Mark Corrigan and Dr. Suzanne Denieffe.

Appendix 19 Consent to Take Part in Study

Title: The Influence of Attachment Styles (Relationship Styles) on the Health Outcomes for Women with Breast Cancer and Their Identified Significant Other.

I………………………………agree to participate in the study for the above main study.

(Insert Full Name)

- The purpose and nature of the study have been explained to me in writing.
- I am participating voluntarily.
- I give permission for my anonymised responses to be used in the study and associated publications and/or presentations.
- If I score high on the scale which deals with emotional & psychological wellbeing I give permission for the researcher to contact me and pass this information onto the Clinical Nurse Specialist.
- I understand that I can withdraw from the study, without repercussions, at any time, whether before it starts or while I am participating.
- I understand that I can withdraw permission to use the information within two weeks of the questionnaire being returned to the researcher, in which case the material will be deleted.
- I understand that anonymity will be ensured by disguising my identity in all reports of the study.

Signed……………………………………. Date……………….

Appendix 20 Information Sheet about a Research Study

1. Title of study: The Influence of Attachment Styles (Relationship Styles) on the Health Outcomes for Women with Breast Cancer and Their Identified Significant Other.

2. Introduction: This sheet is to provide information about an ongoing study within XXXXXXXX. The study aims to determine if an association exists between relationship style, health behaviours and health outcomes. This study asks participants who agree to partake to complete a questionnaire. Participants will be asked to identify a supportive significant other who is key to their care throughout their treatment journey. This identified significant other will be asked to complete a questionnaire also.

3. Procedures: As a participant you will be asked to complete a questionnaire that can be taken home following your clinic appointment and posted back to the researcher using the pre-addressed postage paid envelope.

4. Benefits: It is envisaged that a better understanding of supportive relationships will assist healthcare professionals in providing information and care to individuals with breast cancer and their significant other.

5. Risks: The researcher is not aware of any physical or material side effects or risk associated with completion of the questionnaire, however due to the sensitive nature of some of the questions within the questionnaire there is a possibility of finding some of the questions distressing. If you experience any anxiety or distress as a consequence of completing this questionnaire please contact either the researcher or the clinical nurse specialist at XXXXXXXXXXXX.

6. Inclusion Criteria: In order to be eligible to participate in the study you must be a woman, over 18 years about to undergo surgical treatment for breast cancer. In addition you will need to be able to identify a supportive significant other who will also participate in the study.

7. Alternative treatment: Non participation in the study will have no impact on your treatment.

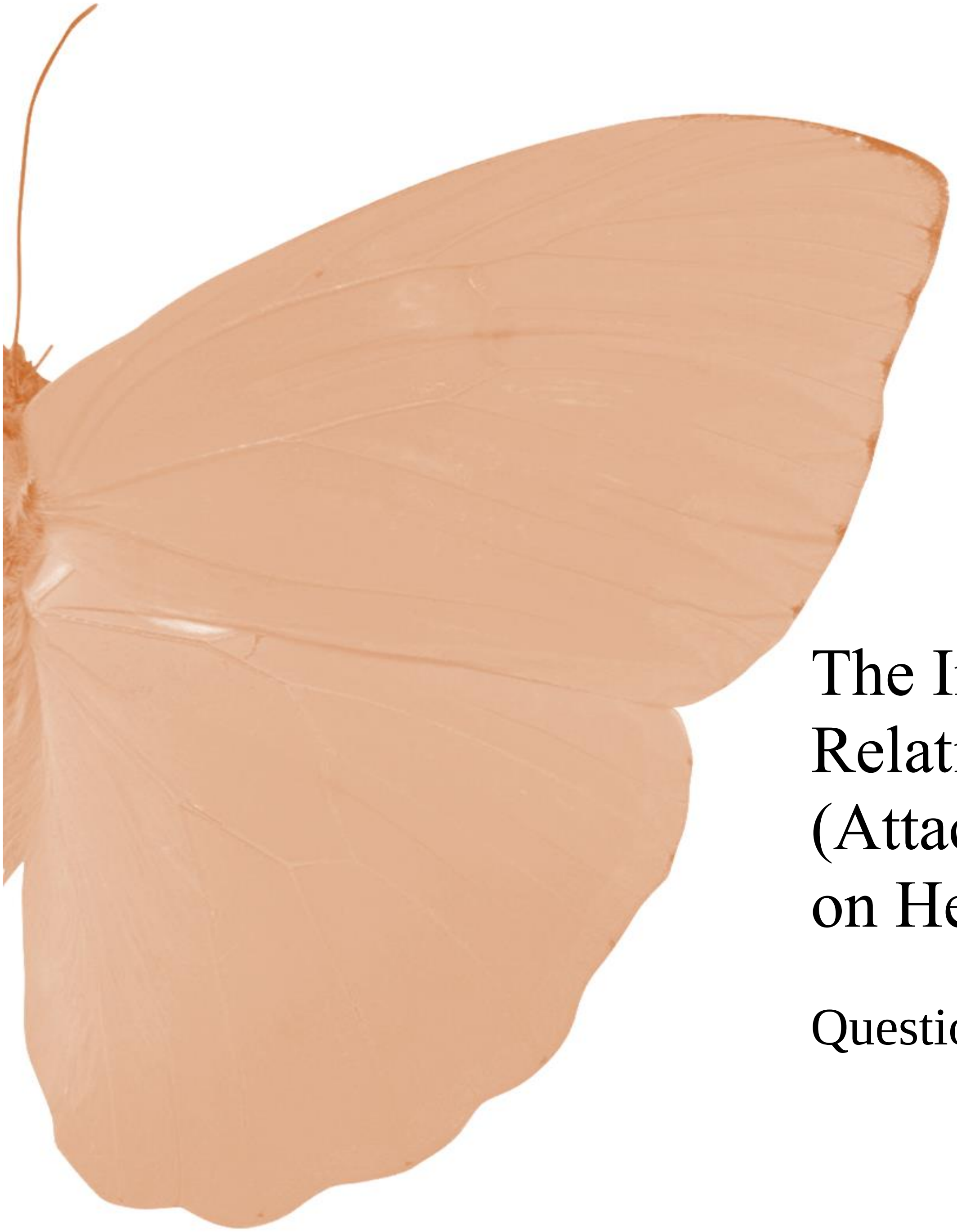
8 Confidentiality: Your identity will remain confidential and your name will not be published. The researcher will store any information in accordance with the Data Protection Act and ensure that it is accessed by select individuals of the research team only.

9. Voluntary Participation: Participation in this study is completely voluntary.

10. Permission: Ethical approval for this study has been provided by the Clinical Research Ethics Committee and is conducted in association with University College Cork.

11. Further information: You can get more information or answers to your questions about the study from the researcher Ms. Ashling Murphy who can be telephoned at 08X-XXXXXXX or emailed at aisling.murphy@ucc.ie or by visiting the link https://www.facebook.com/phd.butterfly. Thank you for taking the time to read this leaflet.

Appendix 21 Questionnaire Package for Woman



The Influence of Relationship (Attachment) Styles on Health Outcomes

Questionnaire for Woman

Study: The Influence of Attachment Styles on Health Outcomes for Women with Breast Cancer and their Identified Significant Other

Thank you for agreeing to participate in this study

- **Please complete the survey independently of your significant other in order to ensure a true insight into your personal experience and to maintain confidentiality of data.**

- **This survey will require you to answer questions by placing a “Tick” mark or circling the most appropriate answer, as directed.**

- **Please ensure that you answer all questions.**

- **The questionnaire should take you approximately 20 minutes to complete and some questions may take more time to answer than others.**

With Gratitude and Appreciation

Ashling Murphy

Nurse Researcher

Section 1: Socio-Demographic Questions

Below is a list of questions about you and your lifestyle. Please answer each question by placing a TICK (√) in the box next to the answer that is most appropriate to you. Please TICK (√) the box corresponding to the answer which is most suitable to you.

1. How old are you (years)?

18-24 ☐
25-34 ☐
35-44 ☐
45-54 ☐
55-64 ☐
65 + years ☐

2. What is your ethnic or cultural background? Please select either A, B, C or D then TICK (√) the most appropriate box. Please TICK (√) <u>one</u> box only.

A. White
Irish ☐
Irish Traveller ☐
Any other white background ☐

B. Black or Black Irish
African ☐
Any other black background ☐

C. Asian or Asian Irish
Chinese ☐
Any other Asian background ☐

D. Other including mixed background
Other please specify ☐
____

3. What is your religion? TICK (√) <u>one</u> box only

Roman Catholic ☐
Church of Ireland ☐
Presbyterian ☐
Islam ☐
Methodist ☐
Other ☐

4. What is your current Marital Status? Please TICK (√) <u>one</u> box

Married (living with spouse) ☐
Single (never married) ☐
Living with partner ☐
Separated ☐
Divorced ☐
Widowed ☐
Other ☐

5. What is the highest level of education (full or part time) you have competed to date?

No Formal Education ☐
Primary Level Education ☐
Secondary Level Education ☐
Third Level Education ☐
Other please specify__________ ☐
____

6. How would you describe your present (current) employment status? TICK (√) one box only.

Working for payment ☐
Looking for regular job ☐
Unemployed ☐
Student ☐
Looking after family or home ☐
Retired from Employment ☐
Unable to work due to illness ☐
Other specify_____________ ☐

7. What is your relationship to the significant other that you have nominated? Please TICK (√) one box.

Spouse/ Partner ☐
Daughter or Son ☐
Son/daughter-in-law ☐
Step child/foster child ☐
Brother or Sister ☐
Parent ☐
Grandchild ☐
Other Related (e.g. cousin) ☐
Other Unrelated (e.g. friend) ☐
Specify _________________________

Section 2: Relationship Styles

8. The following are four statements that people often use to describe their general relationship styles. Please take time to think about each of the following statements, A and B and C and D. Place a TICK (√) next to the letter i.e. A or B or C or D corresponding to the style that best describes you or is closest to the way you are.

☐ **A**. It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don’t worry about being alone or having others not accept me.

☐ **B.** I am uncomfortable getting close to others. I want close relationship but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.

☐ **C.** I want to be emotionally intimate with others, but I find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don’t value me as much as I value them.

☐ **D.** I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me

9. Regardless of how you answered the previous question (i.e. Question 8), please rate <u>EACH</u> of the relationship statements (A and B and C and D) below to indicate how much you agree or disagree with each statement. Please rate <u>All Statements</u> by <u>CIRCLING</u> the number most applicable to you.

Statements	**Strongly Disagree**			**Neutral**			**Strongly Agree**
Style A It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Style B I am uncomfortable getting close to others. I want close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Style C I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Style D I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Section 3: Support Seeking and Receipt

For each of the following statements, mark in the box with a TICK (√) how true each statement is when applied to you generally.

Statements	Not At All True	Barely True	Moderately True	Exactly True
10. When I am down, I need someone who boosts my spirits.				
11. It is important for me to always have someone who listens to me.				
12. Before making any important decisions, I absolutely need a second opinion.				
13. I get along best without any outside help.				
14. In critical situations, I prefer to ask others for their advice.				
15. Whenever I am down I look for someone to cheer me up again.				
16. When I am worried, I reach out to someone to talk to.				
17. If I do not know how to handle a situation I ask others what they would do.				
18. Whenever I need help I ask for it.				

Think about the person who is closest to you, that is the significant other nominated by you. How did this person react to you during the last week? Please <u>mark in the box</u> with a TICK (√) how true EACH statement is when applied to you and your relationship with your nominated significant other.

Statements	**Not At All True**	**Barely True**	**Moderately True**	**Exactly True**
19. This person showed me that he/she loves and accepts me.				
20. This person was there when I needed him/her.				
21. This person comforted me when I was feeling bad.				
22. This person left me alone.				
23. This person did not show much empathy for my situation.				
24. This person complained about me.				
25. This person took care of many things for me.				
26. This person made me feel valued and important.				
27. This person expressed concern about my condition.				
28. This person assured me that I can rely completely on him/her.				
29. This person helped me find something positive in my situation.				
30. This person suggested activities that might distract me.				
31. This person encouraged me not to give up.				
32. This person took care of things I could not manage on my own.				
33. In general, I am very satisfied with the way this person behaved towards me.				

Section 4: Satisfaction with Relationship

For each statement below please CIRCLE the number that best represents how you feel most of the time, with regard to your relationship with your nominated significant other: 0= (do not at all agree); 8= (agree completely).

Statements	Do Not Agree At All				Agree Somewhat				Agree Completely
34. I feel satisfied with our relationship.	0	1	2	3	4	5	6	7	8
35. My relationship is much better than that of others.	0	1	2	3	4	5	6	7	8
36. My relationship is close to ideal.	0	1	2	3	4	5	6	7	8
37. Our relationship makes me very happy.	0	1	2	3	4	5	6	7	8

Section 5: Emotional and Psychological Wellbeing

Please rate by placing a TICK (√) in the box next to the appropriate response, how frequently in the past week, the following statements applied to you:

Statements	Responses
38. I feel tense or 'wound up':	Not at all ☐ From time to time ☐ A lot of the time ☐ Most of the time ☐

39. I still enjoy the things I used to enjoy:	Definitely as much ☐ Not quite so much ☐ Only a little ☐ Hardly at all ☐
40. I get a frightened feeling as if something awful is about to happen:	Not at all ☐ A little, it doesn’t worry me ☐ Yes, but not too badly ☐ Very definitely and quite badly ☐
41. I can laugh and see the funny side of things:	As much as I always could ☐ Not quite so much now ☐ Definitely not so much now ☐ Not at all ☐
42. Worrying thoughts go through my mind:	Only occasionally ☐ From time to time ☐ A lot of the time ☐ A great deal of the time ☐

43. I feel cheerful:	Most of the time ☐ Sometimes ☐ Not often ☐ Not at all ☐
44. I can sit at ease and feel relaxed:	Definitely ☐ Usually ☐ Not often ☐ Not at all ☐
45. I feel as if I am slower doing things:	Not at all ☐ Sometimes ☐ Very often ☐ Nearly all the time ☐
46. I get a frightened feeling like ‘butterflies’ in my stomach:	Not at all ☐ Occasionally ☐ Quite often ☐ Very often ☐

47. I have lost interest in my appearance:	I take just as much care as ever ☐ I may not take quite as much care ☐ I don’t take so much care as I should ☐ Definitely ☐
48. I feel restless as if I have to be on the move at times:	Very much indeed ☐ Quite a lot ☐ Not very much ☐ Not at all ☐
49. I look forward with enjoyment to things:	As much as ever I did ☐ Rather less than I used to ☐ Definitely less than I used to ☐ Hardly at all ☐
50. I get sudden feelings of panic	Not at all ☐ Not very often ☐ Quite often ☐ Very often indeed ☐

51. I can enjoy a good book or radio or TV program	Often ☐ Sometimes ☐ Not often ☐ Very seldom ☐

Section 6: Quality of Life and Health Outcomes

Below is a list of statements. Please CIRCLE one number per line to indicate your response as it applies to you during the past week.

PHYSICAL WELLBEING	**Not at all**	**A little bit**	**Some -what**	**Quite a bit**	**Very much**
52. I have less energy than before	0	1	2	3	4
53. I have nausea	0	1	2	3	4
54. Because of my physical condition, I have trouble meeting the needs of my family	0	1	2	3	4
55. I have pain	0	1	2	3	4
56. I am bothered by side effects of illness/treatment	0	1	2	3	4
57. I feel generally unwell	0	1	2	3	4
58. I am forced to spend time in bed	0	1	2	3	4

Please CIRCLE one number per line to indicate your response as it applies to you during the past week.

SOCIAL/FAMILY WELLBEING

	Not at all	A little bit	Some -what	Quite a bit	Very much
59. I feel close to my friends	0	1	2	3	4
60. I get emotional support from my family	0	1	2	3	4
61. I get support from my friends	0	1	2	3	4
62. My family has accepted my illness	0	1	2	3	4
63. I am satisfied with family communication about my illness	0	1	2	3	4
64. I feel close to my spouse/ partner (or the person who is my main support)	0	1	2	3	4
Regardless of your current level of sexual activity, please answer the following question. If you prefer not to answer it, please mark this box ☐					
65. I am satisfied with my sex life	0	1	2	3	4

EMOTIONAL WELLBEING

	Not at all	A little bit	Some -what	Quite a bit	Very much
66. I feel sad	0	1	2	3	4
67. I am satisfied with how I am coping with my illness	0	1	2	3	4
68. I am losing hope in the fight against my illness	0	1	2	3	4
69. I feel nervous	0	1	2	3	4
70. I worry about dying	0	1	2	3	4
71. I worry that my condition will get worse	0	1	2	3	4

FUNCTIONAL WELLBEING	Not at all	A little bit	Some -what	Quite a bit	Very much
72. I am able to work (includes work at home)	0	1	2	3	4
73. My work (includes work at home) is fulfilling	0	1	2	3	4
74. I am able to enjoy life	0	1	2	3	4
75. I have accepted my illness	0	1	2	3	4
76. I am sleeping well	0	1	2	3	4
77. I am enjoying the things I usually do for fun	0	1	2	3	4
78. I am content with the quality of my life right now	0	1	2	3	4

Please CIRCLE one number per line to indicate your response as it applies to the past week.

ADDITIONAL CONCERNS	Not at all	A little bit	Some -what	Quite a bit	Very much
79. I have experienced shortness of breath	0	1	2	3	4
80. I am self-conscious about the way I dress	0	1	2	3	4
81. One or both of my arms are swollen or tender	0	1	2	3	4
82. I feel sexually attractive	0	1	2	3	4
83. I am bothered by hair loss	0	1	2	3	4
84. I worry that other members of my family might someday get the same illness I have	0	1	2	3	4
85. I worry about the effect of stress on my illness	0	1	2	3	4
86. I am bothered by a change in my weight	0	1	2	3	4
87. I am able to feel like a woman	0	1	2	3	4
88. There are certain parts throughout my body where I experience pain	0	1	2	3	4

89. How long (in weeks) after diagnosis did you start your treatment if applicable? If not applicable please indicate N/A.________________________

90. Please indicate if receiving treatment what treatment you are receiving?
Chemotherapy ☐ Radiotherapy ☐ Both ☐ Surgery ☐ Other ☐ ____________

91. How long has it been since your surgery in weeks if applicable? If not applicable please indicate N/A. _________________

If you would like to make any further comments in relation to the impact or experience that having breast cancer has had on you or your relationship with your significant other please use the space below.

You Have Now Reached the End of the Questionnaire

Thank you for taking the time to complete the questionnaire

Please list below your name, address and contact details.

Name: ________________________________
(Block Capitals)
Address: ________________________________
(Block Capitals) ________________________________
____
Contact Phone Number: ___________________________
Best Time to Receive a Call or Text: _________________

Instructions: Please return this completed questionnaire to the researcher using the pre-addressed postage paid envelope.

Your Participation is Greatly Appreciated

Thank You

Ashling Murphy

Appendix 22 Questionnaire Package for Significant Other

The Influence of Relationship (Attachment) Styles on Health Outcomes

Questionnaire for Significant Other

Study: The Influence of Attachment Styles on Health Outcomes for Women with Breast Cancer and their Identified Significant Other

Thank you for agreeing to participate in this study

- **Please complete the survey independently of your significant other in order to ensure a true insight into your personal experience and to maintain confidentiality of data.**
- **This survey will require you to answer questions by placing a "Tick" mark or circling the most appropriate answer, as directed.**
- **Please ensure that you answer all questions.**
- **The questionnaire should take you approximately 20 minutes to complete and some questions may take more time to answer than others.**

With Gratitude and Appreciation

Ashling Murphy

Nurse Researcher

Section 1: Socio-Demographic Questions

Below is a list of questions about you and your lifestyle. Please answer each question by placing a TICK (√) in the box next to the answer that is most appropriate to you. Please TICK (√) the box corresponding to the answer which is most suitable to you.

1a.What is your Gender

Male ☐
Female ☐

Please TICK (√) the box corresponding to the answer which is most suitable to you.

1b. How old are you (years)?

18-24 ☐
25-34 ☐
35-44 ☐
45-54 ☐
55-64 ☐
65 + years ☐

2. What is your ethnic or cultural background? Please select either A, B, C or D then TICK (√) the most appropriate box. Please TICK (√) <u>one</u> box only.

A. White
Irish ☐
Irish Traveller ☐
Any other white background ☐

B. Black or Black Irish
African ☐
Any other black background ☐

C. Asian or Asian Irish
Chinese ☐
Any other Asian background ☐

D. Other including mixed background
Other please specify ☐
____

3. What is your religion? TICK (√) <u>one</u> box only

Roman Catholic ☐
Church of Ireland ☐
Presbyterian ☐
Islam ☐
Methodist ☐
Other ☐

4. What is your current Marital Status? Please TICK (√) <u>one</u> box

Married (living with spouse) ☐
Single (never married) ☐
Living with partner ☐
Separated ☐
Divorced ☐
Widowed ☐
Other ☐

5. What is the highest level of education (full or part time) you have competed to date?

No Formal Education ☐
Primary Level Education ☐
Secondary Level Education ☐
Third Level Education ☐
Other please specify__________ ☐
____

6. How would you describe your present (current) employment status? TICK (√) <u>one</u> box only.

Working for payment ☐
Looking for regular job ☐
Unemployed ☐
Student ☐
Looking after family or home ☐
Retired from Employment ☐
Unable to work due to illness ☐
Other specify_____________ ☐

7. What is your relationship to the woman with breast cancer? Please TICK(√) <u>one</u> box.

Spouse/ Partner ☐
Daughter or Son ☐
Son/daughter-in-law ☐
Step child/foster child ☐
Brother or Sister ☐
Parent ☐
Grandchild ☐
Other Related (e.g. cousin) ☐
Other Unrelated (e.g. friend) ☐
Specify ________________________

<u>Section 2: Relationship Styles</u>

8. The following are four statements that people often use to describe their general relationship styles. Please take time to think about each of the following statements, A and B and C and D. Place a TICK (√) next to the letter i.e. A or B or C or D corresponding to the style that <u>best describes</u> you or is <u>closest</u> to the <u>way you</u>

☐ **A**. It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don’t worry about being alone or having others not accept me.

☐ **B.** I am uncomfortable getting close to others. I want close relationship but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.

☐ **C.** I want to be emotionally intimate with others, but I find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don’t value me as much as I value them.

☐ **D.** I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.

9. Regardless of how you answered the previous question (i.e. Question 8), please rate EACH of the relationship statements (A and B and C and D) below to indicate how much you agree or disagree with each statement. Please rate All Statements by CIRCLING the number most applicable to you.

Statements	**Strongly Disagree**			**Neutral**			**Strongly Agree**
Style A It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Style B I am uncomfortable getting close to others. I want close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Style C I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Style D I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Section 3: Support Seeking and Receipt

For each of the following statements, mark in the boxes with a TICK **(√) how true each statement is when applied to you generally.**

Statements	**Not At All True**	**Barely True**	**Moderately True**	**Exactly True**
10. When I am down, I need someone who boosts my spirits.				
11. It is important for me to always have someone who listens to me.				
12. Before making any important decisions, I absolutely need a second opinion.				
13. I get along best without any outside help.				
14. In critical situations, I prefer to ask others for their advice.				
15. Whenever I am down I look for someone to cheer me up again.				
16. When I am worried, I reach out to someone to talk to.				
17. If I do not know how to handle a situation I ask others what they would do.				
18. Whenever I need help I ask for it.				

Think about your relative/ friend with breast cancer. How did you react to this person during the last week? Please mark in the box with a TICK (√) how true EACH statement is when applied to you and your relationship with your spouse/relative/friend with breast cancer.

Statements	**Not At All True**	**Barely True**	**Moderately True**	**Exactly True**
19. I showed her how much I cherish and accept her.				
20. I was there when she needed me.				
21. I comforted her when she was feeling bad.				
22. I left her alone.				
23. I did not have much empathy for her.				
24. I criticized her.				
25. I did a lot for her.				
26. I made her feel important and valued.				
27. I expressed my concern about her condition.				
28. I reassured her that she can rely on me.				
29. I helped her find something positive in her situation.				
30. I suggested an activity that might distract her.				
31. I encouraged her not to give up.				
32. I took care of daily duties she could not fulfil on her own.				

Section 4: Satisfaction with Relationship

For each statement below please CIRCLE the number that best represents how you feel most of the time, with regard to your relationship with your nominated significant other: 0= (do not at all agree); 8= (agree completely).

Statements	Do Not Agree At All				Agree Somewhat				Agree Completely
34. I feel satisfied with our relationship.	0	1	2	3	4	5	6	7	8
35. My relationship is much better than that of others.	0	1	2	3	4	5	6	7	8
36. My relationship is close to ideal.	0	1	2	3	4	5	6	7	8
37. Our relationship makes me very happy.	0	1	2	3	4	5	6	7	8

Section 5: Emotional and Psychological Wellbeing

Please rate by placing a TICK (√) in the box next to the appropriate response, how frequently in the past week, the following statements applied to you:

Statements	Responses
38. I feel tense or 'wound up':	Not at all ☐ From time to time ☐ A lot of the time ☐ Most of the time ☐

39. I still enjoy the things I used to enjoy:	Definitely as much	☐
	Not quite so much	☐
	Only a little	☐
	Hardly at all	☐
40. I get a frightened feeling as if something awful is about to happen:	Not at all	☐
	A little, it doesn't worry me	☐
	Yes, but not too badly	☐
	Very definitely and quite badly	☐
41. I can laugh and see the funny side of things:	As much as I always could	☐
	Not quite so much now	☐
	Definitely not so much now	☐
	Not at all	☐
42. Worrying thoughts go through my mind:	Only occasionally	☐
	From time to time	☐
	A lot of the time	☐
	A great deal of the time	☐

43. I feel cheerful:	Most of the time ☐ Sometimes ☐ Not often ☐ Not at all ☐
44. I can sit at ease and feel relaxed:	Definitely ☐ Usually ☐ Not often ☐ Not at all ☐
45. I feel as if I am slower doing things:	Not at all ☐ Sometimes ☐ Very often ☐ Nearly all the time ☐
46. I get a frightened feeling like ‘butterflies’ in my stomach:	Not at all ☐ Occasionally ☐ Quite often ☐ Very often ☐

47. I have lost interest in my appearance:	I take just as much care as ever ☐ I may not take quite as much care ☐ I don’t take so much care as I should ☐ Definitely ☐
48. I feel restless as if I have to be on the move at times:	Very much indeed ☐ Quite a lot ☐ Not very much ☐ Not at all ☐
49. I look forward with enjoyment to things:	As much as ever I did ☐ Rather less than I used to ☐ Definitely less than I used to ☐ Hardly at all ☐
50. I get sudden feelings of panic	Not at all ☐ Not very often ☐ Quite often ☐ Very often indeed ☐

51. I can enjoy a good book or radio or TV program	Often ☐ Sometimes ☐ Not often ☐ Very seldom ☐

Section 6: Quality of Life and Health Outcomes

Below is a list of statements. Please CIRCLE one number per line to indicate your response as it applies to you during the past week.

PHYSICAL WELLBEING	**Not at all**	**A little bit**	**Some -what**	**Quite a bit**	**Very much**
52. I have less energy than before	0	1	2	3	4
53. I have nausea	0	1	2	3	4
54. Because of my physical condition, I have trouble meeting the needs of my family	0	1	2	3	4
55. I have pain	0	1	2	3	4
56. I feel generally unwell	0	1	2	3	4
57. I am forced to spend time in bed	0	1	2	3	4

SOCIAL/FAMILY WELLBEING	Not at all	A little bit	Some -what	Quite a bit	Very much
58. I feel close to my friends	0	1	2	3	4
59. I get emotional support from my family	0	1	2	3	4
60. I get support from my friends	0	1	2	3	4
61. I feel close to my spouse/ partner (or the person who is my main support)	0	1	2	3	4
Regardless of your current level of sexual activity, please answer the following question. If you prefer not to answer it, please mark this box ☐					
62. I am satisfied with my sex life	0	1	2	3	4

Please CIRCLE one number per line to indicate your response as it applies to you during the past week.

EMOTIONAL WELLBEING	Not at all	A little bit	Some -what	Quite a bit	Very much
63. I feel sad	0	1	2	3	4
64. I feel nervous	0	1	2	3	4
65. I worry about dying	0	1	2	3	4
66. I worry that my health will get worse	0	1	2	3	4

FUNCTIONAL WELLBEING

	Not at all	A little bit	Some -what	Quite a bit	Very much
67. I am able to work (includes work at home)	0	1	2	3	4
68. My work (includes work at home) is fulfilling	0	1	2	3	4
69. I am able to enjoy life	0	1	2	3	4
70. I am sleeping well	0	1	2	3	4
71. I am enjoying the things I usually do for fun	0	1	2	3	4
72. I am content with the quality of my life right now	0	1	2	3	4

If you would like to make any further comments in relation to the impact or experience that having breast cancer has had on you or your relationship with your significant other please use the space below.

You Have Now Reached the End of the Questionnaire

Thank you for taking the time to complete the questionnaire

Please list below your name, address and contact details.

Name: ______________________________

(Block Capitals)

Address: ______________________________

(Block Capitals) ______________________________

____

Contact Phone Number: __________________________

Best Time to Receive a Call or Text: ________________

Instructions: Please return this completed questionnaire to the researcher using the pre-addressed postage paid envelope.

Your Participation is Greatly Appreciated

Thank You

Ashling Murphy

Appendix 23 Code Book for Questionnaire

Section	Question(s) for Variable	SPSS Variable Coding	Label		Recode
ID	**Identification number of participant**	**Unique Identifier**		unique identifier for participants	N/A
1:Socio-demographics	1a. what gender are you	**Gender**	1	Male	N/A
			2	Female	
	1b. age in years	**Age**	1	18-24	18-44
			2	25-34	45-54
			3	35-44	55-64
			4	45-54	65+
			5	55-64	
			6	65+	
	2. ethnic origin	**Ethnicity**	1	Irish	N/A
			2	Irish Traveller	
			3	any other white background	
			4	African	
			5	any other black background	
			6	Chinese	
			7	any other Asian	
			8	other	
	3. religious status	**Religion**	1	Roman Catholic	N/A
			2	Church of Ireland	
			3	Presbyterian	
			4	Islam	
			5	Methodist	
			6	other	
	4. current marital status	**MaritalStatus**	1	Married (living with spouse)	Married/living with partner
			2	single (never married)	Not married
			3	living with partner	Married/living with partner
			4	separated	Not married
			5	divorced	Not married
			6	widowed	Not married
			7	other	Not married

Section	Question(s) for Variable	SPSS Variable Coding		Label	Recode
1:Socio-demographics	5. educational status	**Education**	1	no formal	N/A
			2	primary	
			3	secondary	
			4	third level	
			5	other	
	6. current employment status	**Employment**	1	working for payment	Working for payment
			2	looking for job	Not working
			3	unemployed	Not working
			4	student	Not working
			5	looking after family/home	Not working
			6	retired	Not working
			7	unable due to illness	Not working
			8	other	Not working
	7. relationship of significant other	**SigRelationship**	1	spouse/partner	Spouse
			2	daughter/son	Non spouse
			3	son/daughter in law	Non spouse
			4	step child/foster child	Non spouse
			5	brother/sister	Non spouse
			6	parent	Non spouse
			7	grandchild	Non spouse
			8	other related	Non spouse
			9	other unrelated	Non spouse
2: Relationship Styles	8. relationship style	**RelationshipStyle**	1	style a	N/A
	Select from 4		2	style b	
			3	style c	
			4	style d	
	9. Style a	**StyleA**	1	strongly disagree	N/A
			2	disagree a lot	
			3	disagree	
			4	neutral	
			5	agree	
			6	agree a lot	
			7	strongly agree	

Section	Question(s) for Variable	SPSS Variable Coding		Label	Recode
2: Relationship Styles	Style b	**StyleB**	1	strongly disagree	N/A
			2	disagree a lot	
			3	disagree	
			4	neutral	
			5	agree	
			6	agree a lot	
			7	strongly agree	
	Style c	**StyleC**	1	strongly disagree	N/A
			2	disagree a lot	
			3	disagree	
			4	neutral	
			5	agree	
			6	agree a lot	
			7	strongly agree	
	Style d	**StyleD**	1	strongly disagree	N/A
			2	disagree a lot	
			3	disagree	
			4	neutral	
			5	agree	
			6	agree a lot	
			7	strongly agree	
3: Support Seeking & Receipt	10. support seeking and receipt BSSS) scale 10-33	S3_10	1	not at all true	1
			2	barely true	2
			3	moderately true	3
			4	exactly true	4
		S3_11	1	not at all true	1
			2	barely true	2
			3	moderately true	3
			4	exactly true	4
		S3_12	1	not at all true	1
			2	barely true	2
			3	moderately true	3
			4	exactly true	4
		S3_13	1	not at all true	4
			2	barely true	3
			3	moderately true	2
			4	exactly true	1

Section	Question(s) for Variable	SPSS Variable Coding		Label	Recode
3: Support Seeking & Receipt		S3_14	1	not at all true	1
			2	barely true	2
			3	moderately true	3
			4	exactly true	4
		S3_15	1	not at all true	1
			2	barely true	2
			3	moderately true	3
			4	exactly true	4
		S3_16	1	not at all true	1
			2	barely true	2
			3	moderately true	3
			4	exactly true	4
		S3_17	1	not at all true	1
			2	barely true	2
			3	moderately true	3
			4	exactly true	4
		S3_18	1	not at all true	1
			2	barely true	2
			3	moderately true	3
			4	exactly true	4
		S3_19	1	not at all true	1
			2	barely true	2
			3	moderately true	3
			4	exactly true	4
		S3_20	1	not at all true	1
			2	barely true	2
			3	moderately true	3
			4	exactly true	4
		S3_21	1	not at all true	1
			2	barely true	2
			3	moderately true	3
			4	exactly true	4
		S3_22	1	not at all true	4
			2	barely true	3
			3	moderately true	2
			4	exactly true	1

Section	Question(s) for Variable	SPSS Variable Coding		Label	Recode
3: Support Seeking & Receipt		S3_23	1	not at all true	4
			2	barely true	3
			3	moderately true	2
			4	exactly true	1
		S3_24	1	not at all true	4
			2	barely true	3
			3	moderately true	2
			4	exactly true	1
		S3_25	1	not at all true	1
			2	barely true	2
			3	moderately true	3
			4	exactly true	4
		S3_26	1	not at all true	1
			2	barely true	2
			3	moderately true	3
			4	exactly true	4
		S3_27	1	not at all true	1
			2	barely true	2
			3	moderately true	3
			4	exactly true	4
		S3_28	1	not at all true	1
			2	barely true	2
			3	moderately true	3
			4	exactly true	4
		S3_29	1	not at all true	1
			2	barely true	2
			3	moderately true	3
			4	exactly true	4
		S3_30	1	not at all true	1
			2	barely true	2
			3	moderately true	3
			4	exactly true	4
		S3_31	1	not at all true	1
			2	barely true	2
			3	moderately true	3
			4	exactly true	4

Section	Question(s) for Variable	SPSS Variable Coding		Label	Recode
3: Support Seeking & Receipt		S3_32	1	not at all true	1
			2	barely true	2
			3	moderately true	3
			4	exactly true	4
		S3_33	1	not at all true	1
			2	barely true	2
			3	moderately true	3
			4	exactly true	4
4: Satisfaction with Relationship	34. relationship satisfaction scale 34-37	S4_34	1	do not agree at all	N/A
			2	do not agree	
			3	disagree	
			4	agree somewhat	
			5	agree a little	
			6	agree	
			7	agree a lot	
			8	agree completely	
		S4_35	1	do not agree at all	N/A
			2	do not agree	
			3	disagree	
			4	agree somewhat	
			5	agree a little	
			6	agree	
			7	agree a lot	
			8	agree completely	
		S4_36	1	do not agree at all	N/A
			2	do not agree	
			3	disagree	
			4	agree somewhat	
			5	agree a little	
			6	agree	
			7	agree a lot	
			8	agree completely	

Section	Question(s) for Variable	SPSS Variable Coding		Label	Recode
4:Satisfaction with Relationship		S4_37	1	do not agree at all	N/A
			2	do not agree	
			3	disagree	
			4	agree somewhat	
			5	agree a little	
			6	agree	
			7	agree a lot	
			8	agree completely	
5: Emotional Psychological Wellbeing	Hospital Anxiety and Depression Scale 38-51	S5_38	0	not at all	0
			1	from time to time	1
			2	a lot of the time	2
			3	most of the time	3
		S5_39	0	definitely as much	0
			1	not quite as much	1
			2	only a little	2
			3	hardly at all	3
		S5_40	0	not at all	0
			1	a little it doesn't worry me	1
			2	yes, but not too badly	2
			3	very definitely and badly	3
		S5_41	0	as much as I always could	0
			1	not quite so much now	1
			2	definitely not so much now	2
			3	not at all	3
		S5_42	0	only occasionally	0
			1	from time to time	1
			2	a lot of the time	2
			3	a great deal of the time	3

Section	Question(s) for Variable	SPSS Variable Coding		Label	Recode
5: Emotional Psychological Wellbeing		S5_43	0	most of the time	0
			1	sometimes	1
			2	not often	2
			3	not at all	3
		S5_44	0	definitely	0
			1	usually	1
			2	not often	2
			3	not at all	3
		S5_45	0	not at all	0
			1	sometimes	1
			2	very often	2
			3	nearly all the time	3
		S5_46	0	not at all	0
			1	occasionally	1
			2	quite often	2
			3	very often	3
		S5_47	0	I take just as much care as I ever did	0
			1	I may not take quite as much care	1
			2	I don't take so much care as I should	2
			3	definitely	3
		S5_48	0	very much indeed	3
			1	quite a lot	2
			2	not very much	1
			3	not at all	0
		S5_49	0	as much as ever I did	0
			1	rather less than I used to	1
			2	definitely less than I used to	2
			3	hardly at all	3
		S5_50	0	not at all	0
			1	not very often	1
			2	quite often	2
			3	very often indeed	3

Section	Question(s) for Variable	SPSS Variable Coding		Label	Recode
5: Emotional Psychological Wellbeing		S5_51	0	often	0
			1	sometimes	1
			2	not often	2
			3	very seldom	3
6: Quality of Life	FACT Physical wellbeing 52-58	S6PWB_52	0	not at all	4
			1	a little bit	3
			2	somewhat	2
			3	quite a bit	1
			4	very much	0
		S6PWB_53	0	not at all	4
			1	a little bit	3
			2	somewhat	2
			3	quite a bit	1
			4	very much	0
		S6PWB_54	0	not at all	4
			1	a little bit	3
			2	somewhat	2
			3	quite a bit	1
			4	very much	0
		S6PWB_55	0	not at all	4
			1	a little bit	3
			2	somewhat	2
			3	quite a bit	1
			4	very much	0
		S6PWB_56	0	not at all	4
			1	a little bit	3
			2	somewhat	2
			3	quite a bit	1
			4	very much	0
		S6PWB_57	0	not at all	4
			1	a little bit	3
			2	somewhat	2
			3	quite a bit	1
			4	very much	0
		S6PWB_58	0	not at all	4
			1	a little bit	3
			2	somewhat	2
			3	quite a bit	1
			4	very much	0

Section	Question(s) for Variable	SPSS Variable Coding		Label	Recode
6: Quality of Life	FACIT Social/ Family wellbeing scale 59-65	S6SFWB_59	0	not at all	0
			1	a little bit	1
			2	somewhat	2
			3	quite a bit	3
			4	very much	4
		S6SFWB_60	0	not at all	0
			1	a little bit	1
			2	somewhat	2
			3	quite a bit	3
			4	very much	4
		S6SFWB_61	0	not at all	0
			1	a little bit	1
			2	somewhat	2
			3	quite a bit	3
			4	very much	4
		S6SFWB_62	0	not at all	0
			1	a little bit	1
			2	somewhat	2
			3	quite a bit	3
			4	very much	4
		S6SFWB_63	0	not at all	0
			1	a little bit	1
			2	somewhat	2
			3	quite a bit	3
			4	very much	4
		S6SFWB_64	0	not at all	0
			1	a little bit	1
			2	somewhat	2
			3	quite a bit	3
			4	very much	4
		S6SFWB_65	0	not at all	0
			1	a little bit	1
			2	somewhat	2
			3	quite a bit	3
			4	very much	4
6: Quality of Life	FACIT Emotional wellbeing scale 66-78	S6EWB_66	0	not at all	4
			1	a little bit	3
			2	somewhat	2
			3	quite a bit	1
			4	very much	0

Section	**Question(s) for Variable**	**SPSS Variable Coding**		**Label**	**Recode**
6: Quality of Life		S6EWB_67	0	not at all	4
			1	a little bit	3
			2	somewhat	2
			3	quite a bit	1
			4	very much	0
		S6EWB_68	0	not at all	4
			1	a little bit	3
			2	somewhat	2
			3	quite a bit	1
			4	very much	0
		S6EWB_69	0	not at all	4
			1	a little bit	3
			2	somewhat	2
			3	quite a bit	1
			4	very much	0
		S6EWB_70	0	not at all	4
			1	a little bit	3
			2	somewhat	2
			3	quite a bit	1
			4	very much	0
		S6EWB_71	0	not at all	4
			1	a little bit	3
			2	somewhat	2
			3	quite a bit	1
			4	very much	0
6: Quality of Life	FACT Functional wellbeing 72-78	S6FWB_72	0	not at all	0
			1	a little bit	1
			2	somewhat	2
			3	quite a bit	3
			4	very much	4
		S6FWB_73	0	not at all	0
			1	a little bit	1
			2	somewhat	2
			3	quite a bit	3
			4	very much	4
		S6FWB_74	0	not at all	0
			1	a little bit	1
			2	somewhat	2
			3	quite a bit	3
			4	very much	4

Section	Question(s) for Variable	SPSS Variable Coding		Label	Recode
6: Quality of Life		S6FWB_75	0	not at all	0
			1	a little bit	1
			2	somewhat	2
			3	quite a bit	3
			4	very much	4
		S6FWB_76	0	not at all	0
			1	a little bit	1
			2	somewhat	2
			3	quite a bit	3
			4	very much	4
		S6FWB_77	0	not at all	0
			1	a little bit	1
			2	somewhat	2
			3	quite a bit	3
			4	very much	4
		S6FWB_78	0	not at all	0
			1	a little bit	1
			2	somewhat	2
			3	quite a bit	3
			4	very much	4
6: Quality of Life	Additional Concerns for Woman 79-88	Add_79	0	not at all	4
			1	a little bit	3
			2	somewhat	2
			3	quite a bit	1
			4	very much	0
		Add_80	0	not at all	4
			1	a little bit	3
			2	somewhat	2
			3	quite a bit	1
			4	very much	0
		Add_81	0	not at all	4
			1	a little bit	3
			2	somewhat	2
			3	quite a bit	1
			4	very much	0
		Add_82	0	not at all	0
			1	a little bit	1
			2	somewhat	2
			3	quite a bit	3
			4	very much	4

Section	Question(s) for Variable	SPSS Variable Coding		Label	Recode
6: Quality of Life	Additional Concerns for Woman 79-88	Add_83	0	not at all	4
			1	a little bit	3
			2	somewhat	2
			3	quite a bit	1
			4	very much	0
		Add_84	0	not at all	4
			1	a little bit	3
			2	somewhat	2
			3	quite a bit	1
			4	very much	0
		Add_85	0	not at all	4
			1	a little bit	3
			2	somewhat	2
			3	quite a bit	1
			4	very much	0
		Add_86	0	not at all	4
			1	a little bit	3
			2	somewhat	2
			3	quite a bit	1
			4	very much	0
		Add_87	0	not at all	0
			1	a little bit	1
			2	somewhat	2
			3	quite a bit	3
			4	very much	4
		Add_88	0	not at all	4
			1	a little bit	3
			2	somewhat	2
			3	quite a bit	1
			4	very much	0

Appendix 24 Qualitative Analysis of Textual Data

Table 6.1 Qualitative Analysis of Textual Data

Woman with Breast Cancer

Condensed Meaning	Code	Sub Category	Category
Diagnosis toughest part as uncertain	Diagnosis toughest part	Difficult at diagnosis	Time of Diagnosis Difficult
Support from family as diagnosis was awful	Diagnosis hard part	Difficult at diagnosis	Time of Diagnosis Difficult
At start it is a hard road	Difficult at start	Difficult at diagnosis	Time of Diagnosis Difficult
At diagnosis worried how family would cope	Difficult and worry at diagnosis stage	Difficult at diagnosis	Time of Diagnosis Difficult
Good support that brought us closer	Good support	Support	Support from significant other/ friends
Support was there but difficult telling them	Support	Support	Support from significant other/ friends
Asking family for help was difficult but they have been good	Support from family	Support	Support from significant other/ friends
Support from family was there	Support from family	Support	Support from significant other/ friends
Made me and partner help each other through	Help each other through	Help through with support	Support from significant other/ friends
Husband went through same thing and he had known	Help each other when went through same thing	Help and support	Support from significant other/ friends
Worry for family reaction	Worrying for others	Worry	Worry
When diagnosis was worried how family would react	Worrying for family and others	Worry	Worry
Worried how family would cope	Worrying for family and others	Worry	Worry
Worry at the beginning not sure what to expect	Worrying at start	Worry	Worry

Significant Others

Condensed meaning	Code	Sub Category	Category
Diagnosis was difficult time	Difficult at diagnosis	Difficult at diagnosis	Time of diagnosis difficult
Can be a lot going on at the start	Difficult at start	Difficult at diagnosis	Time of diagnosis difficult
Stressful situation Focus on her getting better	Focus on her wellness	Getting her well	Focus on her

Table 6.1 shows analysis of textual data using content analysis. Data was obtained through open ended questions on questionnaire using content analysis. Grey depicts data for women with breast cancer (n=11) and yellow depicts data from significant others (n=3).

Appendix 25 Test of Assumptions in Multi Linear Regression

Table 7.3 Test of Assumptions for Women with Breast Cancer (FACT-GP)

Assumption	Indication	Achieved	Result
Multicollinearity	All Pearson Correlation <0.7 All VIF values <10	YES YES	No Multicollinearity-OK
Normality of residuals	Histogram and P Plots show normal distribution	YES	Normality of residuals OK
Linearity	Relationship between each of the independent variables and dependent variable form a horizontal band	YES	Overall relationship linear
Homogeneity of Residuals	Equally spread over predicted values. Histogram and P Plots, scatterplots show equally spread	YES	Homogeneity OK
Check for Outliers	If any standardised residuals are greater than +/-3 standard deviations in case wise diagnostics	Case 19 (3.184). Regression run again without case-Age and depressive symptoms now statistically significant.	Outliers check OK
Leverage	Is a measure of how far case deviates from Mean. If <0.2safe, 0.2-0.5 risky, 0.5 dangerous	Minimum 0.029 Maximum 0.227 , below 0.5 There are 2 people with lev>0.2. Rerun the analysis with them removed. age and depressive symptoms become significant	Leverage OK
Mahalanobis Distance	12 variables Malahalobis <32.909	Mahalanobis Distance= 32.424	OK
Cooks Distance	To test for points of high influence Maximum value <1 acceptable	0.094- no points of high influence	OK

Table 7.4 Test of Assumptions for Women with Breast Cancer (FACT-B)

Assumption	Indication	Achieved	Result
Multicollinearity	All Pearson Correlation were <0.7 All VIF values <10	YES YES	No Multicollinearity-OK
Normality of residuals	Histogram and P Plots show normal distribution	YES	Normality of residuals OK
Linearity	Relationship between each of the independent variables and dependent variable form a horizontal band	YES	Overall relationship linear
Homogeneity of Residuals	Residuals equally spread over predicted values. Scatter Plots show equally spread	YES	Homogeneity OK
Check for Outliers	If any standardised residuals are greater than +/-3 standard deviations in case wise diagnostics	Case 19 3.329 and Case 58 3.109. Regression run again without cases-no significant changes	Outliers check OK
Leverage	Measure how far case deviates from mean. If <0.2safe, 0.2-0.5 risky, 0.5 dangerous	Minimum 0.030 Maximum 0.248 below 0.5	Leverage OK
Mahalanobis Distance	12 variables Malahalobis <35.446	Malahalobis 36.123	No
Cooks Distance	Maximum value <1 acceptable	0.125- no points of high influence	OK

Table 7.5 Test of Assumptions for Significant Other (FACT-GP)

Assumption	**Indication**	**Achieved**	**Result**
Multicollinearity	All Pearson Correlation were <0.7 All VIF values <10	Gender and relationship 0.865 All VIF <10	No Multicollinearity-OK
Normality of residuals	Histogram and P Plots show normal distribution	YES	Normality of residuals OK
Linearity	Relationship between each of the independent variables and dependent variable form a horizontal band	YES	Overall relationship linear
Homogeneity of Residuals	Residuals equally spread over predicted values. Scatter Plots show equally spread	YES	Homogeneity OK
Check for Outliers	If any standardised residuals are greater than +/-3 standard deviations in case wise diagnostics Run regression again without the case	No Outliers present	No Outliers OK
Leverage	Measure how far case deviates from mean. If <0.2safe, 0.2-0.5 risky, 0.5 dangerous	Minimum 0.03 Maximum 0.334 below 0.5 There are 2 people with lev>0.2. Rerun the analysis with them removed. No significant effects on results.	Leverage OK
Mahalanobis Distance	12 variables Malahalobis <36.123	Malahalobis 43.386 People with high value for Mah (n=2) removed and rerun the analysis with them excluded. With them excluded, age and depressive symptoms become significant	NO
Cooks Distance	Maximum value <1 acceptable	0.097- no points of high influence	OK

Appendix 26 Example of Data set up in SPSS for Dyad

Table 7.5 Dyad data set up in SPSS

ID	FACT-G	A_Group	A_Satisfaction	A_HADS_A	A_HADS_D	P_Group	P_Satisfaction	P_HADS_A	P_HADS_D
001	100	1	28	5	0	2	24	4	3
001	89	2	24	4	3	1	28	5	0
002	78	1	26	0	1	2	30	3	3
002	98	2	30	3	3	1	26	0	1
003	78	1	26	1	4	2	28	1	5
003	82	2	28	1	5	1	26	1	4
004	87	1	30	0	2	2	30	3	0
004	89	2	30	3	0	1	30	0	2
005	94	1	28	4	1	2	32	6	0
005	93	2	32	6	0	1	28	4	1
006	98	1	30	7	6	2	28	5	5
006	86	2	28	5	5	1	30	7	6
007	79	1	26	3	1	2	32	0	0
007	88	2	32	0	0	1	26	3	1
008	90	1	28	3	2	2	24	4	3
008	93	2	24	4	3	1	28	3	2
009	97	1	30	5	3	2	32	2	0
009	98	2	32	2	0	1	30	5	3
010	99	1	26	3	0	2	28	1	1
010	101	2	28	1	1	1	26	3	0

Table 7.5 depicts the data set up for the Actor-Partner Interdependence Modelling for the first 10 paired couples, using SPSS software. This is the layout of the data relating to the dyad (n=114) was run in the model.

ID=code for each individual and the dyad they belong to, note code for significant other and woman with breast cancer are the same. Actor refers to the individual being looked at i.e. the person's whose quality of life (FACT-G) is the dependent variable. The Partner refers to the other person in the dyad/relationship.
FACT-G refers to the quality of life score for the individual on the Functional Assessment to Cancer Therapy Scale. This is the score for the person who is being looked at in the model i.e. the Actor. This is the dependent variable for the model.
A_Group refers to the group that the actor belongs to, group 1 or group 2
1=woman with breast cancer
2=partner of woman with breast cancer,

A_Satisfaction= score on Relationship Satisfaction of Actor
A_HADS_A= score on Hospital Anxiety and Depressive Symptoms (HADS) Scale in terms of Anxiety for the Actor
A_HADS_D= score on Hospital Anxiety and Depressive Symptoms (HADS) Scale in terms of depressive symptoms for the Actor.
P_Group refers to the group that the partner belongs to i.e. group 1 or group 2
1=woman with breast cancer
2=partner of woman with breast cancer,
P_Satisfaction= score on Relationship Satisfaction of Partner
P_HADS_A= score on Hospital Anxiety and Depressive Symptoms (HADS) Scale in terms of Anxiety for the Partner
P_HADS_D= score on Hospital Anxiety and Depressive Symptoms (HADS) Scale in terms of depressive symptoms for the Partner.

Appendix 27 Modelling for Actor-Partner Interdependence Model with Anxiety

Table 7.9(a) Correlation between Anxiety and Relationship Orientation i.e. Model of Self/Model of Other with Anxiety (HADS_A) as Dependent Variable

Relationship Orientation **Model of Self** **Model 1**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Model of Self	0.03	(-0.06 to 0.11)	0.569
Partners Model of Self	0.01	(-0.08 to 0.09)	0.856
Model 2			
Persons Model of Self	0.02	(-0.07 to 0.10)	0.703
Partners Model of Self	0.02	(-0.07 to 0.10)	0.701
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.91	(-1.40 to 0.42)	<0.001**
Model 3			
Persons Model of Self	0.02	(-0.10 to 0.15)	0.710
Partners Model of Self	-0.04	(-0.17 to 0.08)	0.487
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.79	(-1.3 to -0.24)	0.005
Persons Model of Self * persons group	-0.01	(-0.18 to 0.16)	0.877
Partners Model of Self * partners group	0.11	(-0.06 to 0.28)	0.189
Model of Other **Model 1**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Model of Other	0.03	(-0.06 to 0.13)	0.493
Partners Model of Other	-0.00	(-0.10 to 0.09)	0.986
Model 2			
Persons Model of Other	0.03	(-0.06 to 0.13)	0.499
Partners Model of Other	0.00	(-0.09 to 0.09)	0.995
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.91	(-1.40 to - 0.42)	<0.001**
Model 3			
Persons Model of Other	0.01	(-0.12 to 0.15)	0.832
Partners Model of Other	-0.02	(-0.15 to 0.12)	0.765
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.91	(-1.46 to -0.34)	0.002**
Persons Model of Other * persons group	0.04	(-0.15 to 0.22)	0.700
Partners Model of Other * partners group	0.04	(-0.15 to 0.23)	0.663

Table 7.9(a) In terms of Model of Self with anxiety as a dependent variable group that significant other belongs to (p<0.001)and the partners model of self in relation to what group they belong to is significantly correlated with anxiety (p=0.189). In terms of Model of Other and anxiety as a dependent variable the group the significant other belongs to (p<0.001) as well as the persons Model of Other in relation to the person group (p=0.002) are significant. **=variables that were shown to be significant p≤0.05. (ref*)=reference.

Table 7.9(b) Correlation between Anxiety and Relationship Orientation i.e. Attachment Style and Relationship Outcome i.e. Relationship Satisfaction with Anxiety (HADS_A) as dependent variable

Relationship Orientation **Attachment Style** **Model 1**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons (Attachment) Style	-0.03	(-0.23 to 0.17)	0.755
Partners (Attachment) Style	0.02	(-0.18 to 0.21)	0.857
Model 2			
Persons Style	-0.02	(-0.22 to 0.17)	0.811
Partners Style	0.01	(-0.18 to 0.20)	0.917
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.91	(-1.40 to -0.42)	<0.001**
Model 3			
Persons Style	-0.02	(-0.30 to 0.25)	0.867
Partners Style	0.04	(-0.24 to 0.32)	0.777
Group			
Woman with breast cancer (ref*)	0		
Significant other	-1.03	(-2.23 to 0.17)	0.091
Persons Style* persons group	0.00	(-0.38 to 0.38)	0.999
Partners Style* partners group	-0.06	(-0.44 to 0.32)	0.768
Relationship Outcome **Relationship Satisfaction** **Model 1**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Satisfaction	-0.12	(-0.21 to 0.00)	0.032**
Partners Satisfaction	0.06	(-0.03 to 0.16)	0.200
Model 2			
Persons Satisfaction	-0.08	(-0.18 to 0.01)	0.093
Partners Satisfaction	0.03	(-0.05 to 0.14)	0.423
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.81	(-1.30 to -0.32)	0.002**
Model 3			
Persons Satisfaction	-0.12	(-0.24 to 0)	0.071
Partners Satisfaction	0.00	(-0.12 to 0.12)	0.992
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.17	(-7.32 to 6.97)	0.962
Persons satisfaction * persons group	0.80	(-0.12 to 0.28)	0.444
Partners satisfaction * partners group	0.10	(-0.10 to 0.31)	0.326

Table 7.9(b) In terms of Attachment Style with Anxiety as a dependent variable, the group the significant other belongs to i.e. whether woman with breast cancer or partner of woman with breast cancer, is negatively associated with anxiety (p<0.001) with significant others having lower scores. In terms of Relationship Outcome i.e. relationship satisfaction with anxiety as a dependent variable, the person relationship satisfaction is negatively correlated with anxiety (p=0.032, r=-0.12), the partners relationship satisfaction is positively associated with anxiety (p=0.200, r=0.06) although this does not remain so when controlled for group that partner belongs to (Model 2). **=variables that were shown to be significant p≤0.05. (ref*)=reference

Table 7.9(c) Correlation between Anxiety and Affective States i.e. Depressive Symptoms with Anxiety (HADS_A) as dependent variable

Depressive Symptoms **Model 1**	**Regression coefficient**	**(95% CI)**	**P-value**
Persons HADS_D	0.96	0.84 to 1.11	<0.001**
Partners HADS_D	0.13	-0.01 to 0.26	0.061
Model 2			
Persons HADS_D	0.95	(0.81 to 1.09)	<0.001**
Partners HADS_D	0.15	(0.01 to 0.29)	0.032**
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.28	(-0.70 to 0.13)	0.179
Model 3			
Persons HADS_D	1.04	(0.88 to 1.20)	<0.001**
Partners HADS_D	0.18	(0.02 to 0.34)	0.024**
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.13	(-0.66 to 0.40)	0.621
Persons HADS_D * persons group	-0.33	(-0.64 to -0.01	0.041**
Partners HADS_D * partners group	-0.12	(-0.44 to 0.19)	0.438

Table 7.9(c) In terms of affective states anxiety and depressive symptoms, the person's depressive symptoms and the partner's depressive symptoms are correlated with anxiety (Model 1). The group the significant other belongs to i.e. whether woman with breast cancer or her partner is also associated with anxiety, with significant others demonstrating negative association between anxiety and depressive symptoms (P=0.179, r=-0.28). The person depressive symptoms and their partner's depressive symptoms remain significant when group is controlled for. The person depressive symptoms in relation to their group also remains significant (p=0.041, r=-0.33), **=variables that were shown to be significant p≤0.05. (ref*)=reference

Table 7.9(d) Correlation between Anxiety and Relationship Behaviours i.e. Support with Anxiety (HADS_A) as dependent variable

Need for Support **Model 1**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Need for Support	0.00	(-0.18 to 0.18)	0.989
Partners Need for Support	0.02	(-.16 to 0.21)	0.797
Model 2			
Persons Need for Support	0.04	(-0.14 to 0.22)	0.676
Partners Need for Support	-0.01	(-0.19 to 0.17)	0.887
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.93	(-1.42 to 0.43)	<0.001**
Model 3			
Persons Need for Support	-0.04	(-0-.33 to 0.25)	0.792
Partners Need for Support	-0.07	(-0.35 to 0.22)	0.653
Group			
Woman with breast cancer (ref*)	0		
Significant other	-1.38	(-6.68 to 3.92)	0.607
Persons Need for Support * persons group	0.13	(-0.24 to 0.50)	0.496
Partners Need for Support * partners group	0.09	(-0.28 to 0.47)	0.634
Support Seeking **Model 1**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Support Seeking	-0.02	(-0.17 to 0.13)	0.779
Partners Support Seeking	0.01	(-0.13 to 0.16)	0.852
Model 2			
Persons Support Seeking	-0.01	(-0.15 to 0.13)	0.882
Partners Support Seeking	0	(-0.14 to 0.15)	0.959
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.91	(-1.40 to -0.42)	<0.001**
Model 3			
Persons Support Seeking	0.03	(-0.18 to 0.23)	0.778
Partners Support Seeking	0.06	(-0.15 to 0.26)	0.570
Group			
Woman with breast cancer (ref*)	0		
Significant other	-1.39	(-7.12 to 4.35)	0.633
Persons Support Seeking * persons group	-0.08	(-0.37 to 0.21)	0.588
Partners Support Seeking * partners group	-0.11	(-0.40 to 0.18)	0.455

Table 7.9(d) In terms of need for support and support seeking only the group that the significant other belongs to is correlated with anxiety (p<0.001) with significant others demonstrating a negative correlation with support and anxiety. **=variables that were shown to be significant p≤0.05. (ref*)=reference

Table 7.9(e) Correlation between Anxiety and Relationship Behaviours i.e. Support with Anxiety (HADS_A) as dependent variable

Relationship Behaviours **Support (Overall)** **Model 1**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Support	0.01	(-0.05 to 0.06)	0.785
Partners Support	0.01	(-0.04 to 0.07)	0.600
Model 2			
Persons Support	0.02	(-0.03 to 0.08)	0.457
Partners Support	0.001	(-0.05 to0.05)	0.951
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.94	(-1.44 to -0.44)	<0.001**
Model 3			
Persons Support	0.05	(-0.03 to 0.12)	0.209
Partners Support	0.00	(-0.07 to 0.08)	0.901
Group			
Woman with breast cancer (ref*)	0		
Significant other	2.88	(-8.55 to 14.31)	0.619
Persons Support * persons group	-0.06	(-0.16 to 0.05)	0.295
Partners Support * partners group	-0.01	(-0.11 to 0.10)	0.902
Actual Support **Model 1**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Actual Support	0.02	(-0.06 to 0.10)	0.568
Partners Actual Support	0.03	(-0.05 to 0.11)	0.521
Model 2			
Persons Actual Support	0.04	(-0.04 0.12)	0.328
Partners Actual Support	0.01	(-0.07 to 0.09)	0.804
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.94	(-1.44 to -0.44)	<0.001**
Model 3			
Persons Actual Support	0.09	(-0.01 to 0.20)	0.085
Partners Actual Support	-0.00	(-0.11 to 0.10)	0.947
Group			
Woman with breast cancer (ref*)	0		
Significant other	6.17	(-5.3 to 17.4)	0.289
Persons Actual Support * persons group	-0.12	(-0.27 to 0.035)	0.129
Partners Actual Support * partners group	0.03	(-0.13 to 0.18)	0.742

Table 7.9(e) In terms of overall support only the group that the significant other belongs to (p<0.001, r=-0.94) and the person own overall support is correlated with anxiety (p=0.209, r=0.05) with significant others demonstrating a negative correlation with support and anxiety. For actual support again the group that the significant other belongs to (p<0.001, r=-0.94) (Model 2), as well as the persons actual support in relation to the person group remains significant (p=0.129, r=-0.12). **=variables that were shown to be significant p≤0.05. (ref*)=reference

Appendix 28 Modelling for Actor-Partner Interdependence Model with Depressive Symptoms

Table 7.10(a) Correlation between Depressive Symptoms and Relationship Orientation i.e. Model of Self/Model of Other with Depressive Symptoms (HADS_D) as Dependent Variable

Relationship Orientation **Model of Self** **Model 1**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Model of Self	-0.03	(-0.09 to 0.04	0.408
Partners Model of Self	0.04	(-0.02 to 0.11)	0.161
Model 2			
Persons Model of Self	-0.03	(-0.09 to 0.03)	0.270
Partners Model of Self	0.05	(-0.01 to 0.11)	0.089
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.79	(-1.16 to -0.42)	<0.001**
Model 3			
Persons Model of Self	0.02	(-0.07 to 0.11)	0.652
Partners Model of Self	-0.01	(-0.09 to 0.08)	0.832
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.58	(-0.98 to -0.19)	0.004**
Persons Model of Self * persons group	-0.09	(-0.22 to 0.02)	0.097
Partners Model of Self * partners group	0.11	(-0.00 to 0.23)	0.057
Model of Other **Model 1**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Model of Other	-0.00	(-0.07 to 0.06)	0.889
Partners Model of Other	0.04	(-0.02 to 0.11)	0.192
Model 2			
Persons Model of Other	-0.01	(-0.07 to 0.05)	0.863
Partners Model of Other	0.05	(-0.02 to 0.11)	0.167
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.76	(-1.13 to -0.39)	<0.001**
Model 3			
Persons Model of Other	0.01	(-0.09 to 0.10)	0.901
Partners Model of Other	0.01	(-0.08 to 0.10)	0.786
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.67	(-1.09 to -0.24)	0.002**
Persons Model of Other * persons group	-0.02	(-0.15 to 0.11)	0.727
Partners Model of Other * partners group	0.07	(-0.06 to 0.20)	0.313

Table 7.10(a) In terms of Model of Self with depressive symptoms as a dependent variable the partners Model of Self is significant (p=0.161), In Model 2 the partners Model of Self is positively correlated with depressive symptoms(p=0.089, r=0.05), the group that the significant other belongs to is negatively with depressive symptoms (p<0.001, r=-0.79). In terms of Model of Other and depressive symptoms as a dependent variable the partners Model of Other is positively correlated, the group the significant other belongs to (p<0.001, r=-0.76) as well as the persons Model of Other in relation to the persons group (p=0.002) are significant. **=variables that were shown to be significant p≤0.05. (ref*)=reference.

Table 7.10(b) Correlation between Depressive Symptoms and Relationship Orientation i.e. Attachment Style and Relationship Outcome i.e. Relationship Satisfaction with Depressive Symptoms (HADS_D) as dependent variable

Relationship Orientation **Attachment Style** **Model 1**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons (Attachment) Style	0.05	(-0.09 to 0.19)	0.471
Partners (Attachment) Style	-0.05	(-0.19 to0.09)	0.465
Model 2			
Persons Style	0.06	(-0.08 to 0.019)	0.409
Partners Style	-0.06	(-0.19 to 0.08)	0.386
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.77	(-1.14 to -0.39)	<0.001**
Model 3			
Persons Style	0.02	(-0.18 to 0.21)	0.860
Partners Style	-0.04	(-0.23 to0.15)	0.674
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.99	(-1.90 to -0.09)	0.032**
Persons Style* persons group	0.07	(-0.19 to 0.35)	0.581
Partners Style* partners group	-0.04	(-0.31 to 0.23)	0.797
Relationship Outcome **Relationship Satisfaction** **Model 1**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Satisfaction	-0.05	(-0.12 to 0.02)	0.143
Partners Satisfaction	0.04	(-0.03 to 0.12)	0.219
Model 2			
Persons Satisfaction	-0.03	(-0.10 to 0.04)	0.372
Partners Satisfaction	0.02	(-0.05 to 0.09)	0.513
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.71	(-1.09 to -0.33)	<0.001**
Model 3			
Persons Satisfaction	-0.01	(-0.10 to 0.08)	0.851
Partners Satisfaction	-0.00	(-0.09 to 0.09)	0.960
Group			
Woman with breast cancer (ref*)	0		
Significant other	3.1	(-2.32 to 8.6)	0.257
Persons satisfaction * persons group	-0.07	(-0.21 to 0.08)	0.373
Partners satisfaction * partners group	0.07	(-0.07 to 0.21)	0.333

Table 7.10(b) In terms of Attachment Style with Depressive Symptoms as a dependent variable, the group the significant other belongs to i.e. whether woman with breast cancer or partner of woman with breast cancer, is negatively associated with Depressive Symptoms (p<0.001, R=-0.77) with significant others having lower scores. In terms of Relationship Outcome i.e. relationship satisfaction with Depressive Symptoms as a dependent variable, the person relationship satisfaction is negatively correlated with Depressive Symptoms (p=0.143, r=-0.05), In Model 2, only the group that the significant other belongs to remains significant (p<0.001, r=-0.71). **=variables that were shown to be significant p≤0.05. (ref*)=reference

Table 7.10(c) Correlation between Depressive Symptoms and Affective States i.e. Anxiety with Depressive Symptoms (HADS_D) as dependent variable

Anxiety **Model 1**	**Regression coefficient**	**(95% CI)**	**P-value**
Persons HADS_A	0.49	(0.42 to 0.56)	<0.001**
Partners HADS_A	-0.02	(-0.09 to 0.05)	0.563
Model 2			
Persons HADS_A	0.47	(0.40 to 0.54)	<0.001**
Partners HADS_A	-0.00	(-0.07 to 0.07)	0.994
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.34	(-0.63 to -0.04)	0.025**
Model 3			
Persons HADS_A	0.51	0.43 to 0.60)	<0.001**
Partners HADS_A	-0.03	-0.11 to 0.05)	0.509
Group			
Woman with breast cancer (ref*)	0		
Significant other	0.10	(-0.31 to 0.50)	0.638
Persons HADS_A * persons group	-0.18	(-0.34 to -0.03)	0.020**
Partners HADS_A * partners group	0.12	(-0.03 to 0.27)	0.119

Table 7.10(c) In terms of affective states anxiety and depressive symptoms, the person's anxiety are positively correlated with depressive symptoms (p<0.001, r=0.49) (Model 1) , this remains the case when control for group (p<0.001, r=0.47) (Model 2). The group the significant other belongs to i.e. whether woman with breast cancer or her partner is also associated with depressive symptoms, with significant others demonstrating negative association between anxiety and depressive symptoms (P=0.025, r=-0.34). The person anxiety remains significant when group is controlled for (p<0.001, r=0.51)(Model 3). The persons anxiety in relation to their group also remains significant (p=0.020, r=-0.18) as well as their partners anxiety (p=0.119, r=0.12) in association with depressive symptoms. **=variables that were shown to be significant p≤0.05. (ref*)=reference

Table 7.10(d) Correlation between Depressive Symptoms and Relationship Behaviours i.e. Support with Depressive Symptoms (HADS_D) as dependent variable

Need for Support **Model 1**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Need for Support	-0.01	(-0.14 to 0.12)	0.829
Partners Need for Support	-0.01	(-0.14 to 0.13)	0.940
Model 2			
Persons Need for Support	0.02	(-0.11 to 0.14)	0.795
Partners Need for Support	-0.04	(-0.16 to 0.09)	0.574
Group			.
Woman with breast cancer (ref*)	0		
Significant other	-0.77	(-1.15 to -0.396)	<0.001**
Model 3			
Persons Need for Support	0.10	(-0.10 to 0.30)	0.341
Partners Need for Support	0.02	(-0.18 to0.22)	0.838
Group			
Woman with breast cancer (ref*)			
Significant other	-0.33	(-4.34 to3.67)	0.869
Persons Need for Support * persons group	-0.15	(-0.40 to0.12)	0.303
Partners Need for Support * partners group	-0.10	9-0.36 to0.16)	0.456
Support Seeking **Model 1**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Support Seeking	-0.03	(-0.13 to 0.08)	0.622
Partners Support Seeking	0.03	(-0.08 to 0.13)	0.587
Model 2			
Persons Support Seeking	-0.02	(-0.12 to 0.08)	0.734
Partners Support Seeking	0.02	(-0.08 to 0.12)	0.710
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.75	(-1.12 to-0.38)	<0.001**
Model 3			
Persons Support Seeking	0.05	(-0.09 to 0.20)	0.460
Partners Support Seeking	-0.04	(-0.18 to 0.11)	0.611
Group			
Woman with breast cancer (ref*)	0		
Significant other	3.23	(-1.08 to 7.55)	0.140
Persons Support Seeking * persons group	-0.14	(-0.34 to 0.06)	0.166
Partners Support Seeking * partners group	0.11	(-0.09 to 0.32)	0.274

Table 7.10(d) In terms of need for support only the group that the significant other belongs to (p<0.001, r=-0.77) was associated with depressive symptoms. For support seeking again the group that the significant other belongs to (p<0.001, r=-0.75) (Model 2), In Model 3, the group the significant other belongs to was significant (p=0.140, r=3.23) with significant others scoring higher, as well as the persons support seeking in relation to the person group remains significant (p=0.166, r=-0.14).

Table 7.10(e) Correlation between Depressive Symptoms and Relationship Behaviours i.e. Support with Depressive Symptoms (HADS_D) as dependent variable

Relationship Behaviours Support (Overall) Model 1	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Support Partners Support	0.03 -0.00	(-0.10 to 0.07) (-0.04 to 0.03)	0.141 0.841
Model 2			
Persons Support	0.04	(0.00 to 0.08)	0.033**
Partners Support	-0.02	(-0.05 to 0.02)	0.395
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.85	(-1.22 to -0.47)	<0.001**
Model 3			
Persons Support	0.08	(0.03 to 0.13)	0.002**
Partners Support	-0.02	(-0.07 to 0.04)	0.540
Group			
Woman with breast cancer (ref*)	0		
Significant other	5.73	(-2.76 to 14.21)	0.184
Persons Support * persons group	-0.09	(-0.16 to -0.01)	0.020
Partners Support * partners group	-0.00	(-0.08 to 0.07)	0.967
Actual Support Model 1	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Actual Support Partners Actual Support	0.07 -0.00	(0.01 to 0.12) (-0.06 to 0.05)	0.019** 0.941
Model 2			
Persons Actual Support	0.08	(0.03 to 0.14)	0.003**
Partners Actual Support	-0.02	(-0.07 to 0.04)	0.518
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.87	(-1.24 to -0.50)	<0.001**
Model 3			
Persons Actual Support	0.12	(0.05 to 0.19)	<0.001**
Partners Actual Support	-0.01	(-0.08 to 0.06)	0.725
Group			
Woman with breast cancer (ref*)	0		
Significant other	2.91	(-5.55 to 11.38)	0.497
Persons Actual Support * persons group	-0.10	(-0.20 to 0.01)	0.085
Partners Actual Support * partners group	-0.02	(-0.13 to 0.09)	0.751

Table 7.10(e) shows the correlation between overall support and depressive symptoms, the persons score on support as well as the group that the significant other belongs to (p<0.001, r=-0.85) were shown to be significant. The persons own overall support is correlated with depressive symptoms (p=0.002, r=0.08) as well as the group that the person belongs to with significant others demonstrating, positive correlation between depressive symptoms and support (p=0.184, r=5.73). The person support in relation to the group that the person belongs is also significant (p=0.02, r=-0.09). For actual support, the person own actual support was positively associated with depressive symptoms (Model 1) this remained significant when group was controlled for (Model 2), In Model 3, again the persons own actual support was positively correlated with depressive symptoms (p<0.001, r=-0.12).

Table 7.10 (f) Correlation between Significant Variables from Model 1,2 and 3 with Anxiety (HADS_A) as Dependent Variable (Final Model A and B)

Model of Other **Model A**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Model of Other	0.03	(-0.03 to 0.10)	0.330
Model B			
Persons Group * Model of Other	0.01	(-0.08 to 0.11)	0.801
Woman with breast cancer (ref*)	0		
Significant other	0.04	(-0.10 to 0.17)	0.599
Relationship Satisfaction **Model A**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Satisfaction	-0.05	(-0.12 to 0.023)	0.174
Model B			
Persons Group * Satisfaction	-0.06	(-0.13 to 0.02)	0.121
Woman with breast cancer (ref*)	0		
Significant other	-0.002	(-0.02 to 0.02)	0.812
Depressive Symptoms **Model A**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Depressive Symptoms	0.95	(0.81 to 1.09)	<0.001**
Partners Depressive Symptoms	0.15	(0.01 to 0.29)	0.036**
Model B			
Persons Group * Depressive Symptoms	1.04	(0.88 to 1.20)	<0.001**
Woman with breast cancer (ref*)			
Significant other	-0.36	(-0.671 to -0.04)	0.026**
Group **Model A**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.24	(-0.65 to 0.17)	0.248
Model B			
Persons Group			
Woman with breast cancer (ref*)	0		
Significant other	-3.61	(-7.95 to 0.74)	0.104

Table 7.10(f) shows the correlation between Model of Other, Relationship Satisfaction, Depressive Symptoms and the Group that the person belongs to in relation to Anxiety level (Dependent Variable) as depicted by HADS_A scores.

Table 7.10 (g) Correlation between Significant Variables from Model 1,2 and 3 with Anxiety (HADS_A) as Dependent Variable (Final Model C)

Model C **Persons Group and Partners Group and Depressive Symptoms with HADS_A (Anxiety level) as Dependent Variable**	**Regression coefficient**	**(95% CI)**	***p*-value**
Person Depressive Symptoms (HADS_D)	0.95	(0.81 to 1.09)	<0.001**
Partners Depressive Symptoms	0.15	(0.01 to 0.29)	0.032**
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.28	(-0.70 to 0.13)	0.179

Table 7.10(g) shows the correlation between Depressive Symptoms and the Group that the person belongs to in relation to Anxiety level (Dependent Variable) as depicted by HADS_A scores. These were chosen to be inputted into the Final Model C as they were shown to be significant in Model A,B.

Table 7.11 (h) Correlation between Variables from Model 1,2 and 3 with Depressive Symptoms (HADS_D) as Dependent Variable (Final Model A and B)

Model of Other **Model A**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Model of Other	0.02	(-0.06 to 0.09)	0.64
Model B			
Persons Group * Model of Other	-0.04	(-0.13 to 0.06)	0.429
Woman with breast cancer (ref*)	0		
Significant other	0.10	(-0.04 to 0.23)	0.151
Model of Self **Model A**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Model of Self	-0.05	(-0.12 to 0.02)	0.187
Model B			
Persons Group * Model of Self	0.03	(-0.06 to 0.13)	0.463
Woman with breast cancer (ref*)	0		
Significant other	-0.15	(-0.27 to -0.03)	0.018**
Attachment Style **Model A**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Attachment Style	0.01	(-0.14 to 0.17	<0.001**
Partners Attachment Style	-0.06	(-0.16 to 0.04	0.986
Model B			
Persons Group * Attachment Style	0.016	(-0.19 to 0.23)	0.877
Woman with breast cancer (ref*)			
Significant other	-0.03	(-0.33 to 0.26)	0.827
Actual Support **Model A**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Actual Support			
Model B			
Persons Group * Actual Support	0.08	(0.04 to 0.14)	<0.001**
Woman with breast cancer (ref*)	0		
Significant other	-0.06	(-0.14 to 0.02)	0.120
Group **Model A**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Group	-0.36	(-0.65 to -0.07)	0.017**
Woman with breast cancer (ref*)			
Significant other			
Model B			
Persons Group			
Woman with breast cancer (ref*)	0		
Significant other	2.95	(-0.79 to 6.70)	0.122
Anxiety **Model A**	**Regression coefficient**	**(95% CI)**	***p*-value**
Persons Anxiety	0.47	(0.42 to 0.58)	<0.001**
Partners Anxiety	0	(-0.03 to 0.23)	0.125
Model B			
Persons HADS_A	0.50	(0.42 to 0.58)	<0.001**
Persons Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.17	(-0.32 to -0.02)	0.030**

Table 7.10(h) shows the correlation between Model of Other, Model of Self, Attachment Style, Actual Support, Group and Anxiety level in relation to Depressive Symptoms (Dependent Variable) as depicted by HADS_D scores.

Table 7.10 (i) Correlation between Significant Variables from Model 1,2 and 3 with Depressive Symptoms (HADS_D) as Dependent Variable (Final Model C)

Table 7.10(i) shows the correlation between Anxiety and the Group that the person belongs to in relation to Depressive Symptoms (Dependent Variable) as depicted by HADS_D scores. These were chosen to be inputted into the Final Model C as they were shown to be significant in Model A,B. $p \leq 0.05$

Model C Persons Group and Partners Group and Anxiety Level with HADS_D (Depressive Symptoms) as Dependent Variable	Regression coefficient	(95% CI)	*p*-value
Persons Anxiety (HADS_A)	0.47	(0.40 to 0.54)	<0.001**
Partners Anxiety (HADS_A)	-0.002	(-0.07 to -0.07)	0.994
Group			
Woman with breast cancer (ref*)	0		
Significant other	-0.34	(-0.63 to -0.04)	0.025**