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Massage Therapy Effects on Pain and Distress/Anxiety in Breast Cancer Patients

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Walden University
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Abstract

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MA, Dowling College, 2003

BS, Cortland College, 1998

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

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Abstract

Pain and distress/anxiety are likely to result from breast cancer and/or the medical treatment associated with this illness. Breast cancer researchers have focused on massage therapy and its influence on pain and distress in breast cancer patients; however, these research efforts were limited by small sample sizes, homogeneous populations, and small to medium effect sizes. This study explores the effectiveness of massage therapy for decreasing pain and distress in a larger, heterogeneous population of breast cancer patients and across all durations and frequencies of treatment by pooling the findings of former studies. The gate control theory which relates to the experience of pain, the psychotherapy theory which suggests massage acts much like psychotherapy, and the physical touch theory all suggest that massage may decrease pain and distress/anxiety. In order to be included in the meta-analysis, the study needed to be printed in English between the years 2004 and 2012, use the same variables and same method of treatment, and report an effect size or statistics that allowed for effect size calculation. The meta-analysis was quantitative and the effect sizes were calculated for each study using Comprehensive Meta-Analysis (CMA) software. CMA also calculated the overall pooled effect size. Findings indicated that individual studies showed some improvements in pain and distress after receiving treatment; however, when pooled, the results indicated that massage therapy did not significantly improve levels of pain and distress in breast cancer patients. Although findings were non significant, the use of massage therapy improved symptoms of pain and distress in breast cancer patients.

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Dedication

I would like to dedicate this work to my mother and father. They have taught me the art of commitment and push for tenacity. I would also like to thank my brother Erich for your support and words of encouragement. Lastly, I would like to thank my significant other. You have cheered me on to the finish line and have always been an ear when I was the most frustrated. Thank you, all.

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Chapter 1: Introduction to the Study

Introduction

Breast cancer, along with many other forms of cancer, has been on the rise for years. Breast cancer is not only the most prevalent cancer detected in women today, but it also follows lung cancer as the second leading cause of death in the United States (Brem & Kumar, 2011). According to Chapman (2011), medical treatments such as radiotherapy, chemotherapy, and surgery have improved a cancer patients' survival rate, five years after having been diagnosed with cancer. Phillips and Currow (2010) referred to cancer as a chronic illness rather than terminal illness, and Macmillian Cancer Support (2008), indicated that in the United Kingdom, 2 million individuals are living with or have battled cancer in the past. Furthermore, that this figure is increasing by three percent every year.

It is because of the boost in life expectancy, that breast cancer patients are faced with additional physiological and psychological symptoms that impact quality of life (Brem & Kumar, 2011). Studies suggest that massage therapy may be to be effective with respect to the diminishing symptoms such as pain and distress (Hernandez-Reif et al., 2005). However researchers used small sample sizes (Hernandez-Reif et al., 2005).

In the following meta-analysis study, I explored symptoms of pain and distress/anxiety and the effectiveness of massage therapy for diminishing these symptoms among breast cancer patients of various populations. Doing so provided a clear understanding of how effective massage therapy is on pain and distress/anxiety in breast cancer patients and allowed for generalization with respect to its effectiveness across all

populations of breast cancer patients. Generalization and effectiveness of massage therapy may lead to social change in that it could potentially lessen any additional costs to the healthcare system or the need to take pain or distress/anxiety medication.

In this chapter, I provide an overview of the literature related to this topic, describe a gap in the knowledge of this topic, and explain in detail why the study was conducted. I also discuss the research problem, the purpose of the study, identify the research questions and hypotheses, and explain the theories related to the topic. Next, the nature of the study, define definitions and variables, give an overview with respect to the scope, limitations, and delimitations of the study are identified as well as how this study was valuable to the current field.

Background

While there continues to be many helpful pharmacological treatments that may assist patients with pain and distress associated with cancer diagnosis and surgical procedures, ingesting these medications could also result in additional unwanted side effects (Tatrow & Montgomery, 2006). Many former studies have noted that non-pharmacological treatments are helpful in improving overall function in patients with chronic illnesses such as cancer (Meyer & Mark, 1995).

Complementary treatments may improve a patients' fear of pain (Reaves & McManis, 2010) and actual pain that results from illness and treatment (Raphael et al., 2010). According to Reaves and McManis (2010), patients who received alternative or holistic approaches in addition to medical treatment reported a decrease in pain severity. Other researchers found that patients who received complementary treatments, reported

lower levels of psychological distress (Gielissen, Verhagen, Witjes, & Bleijenberg, 2006).

Researchers have shown that massage therapy has positively impacted unwanted symptoms in breast cancer patients (Post-White et al., 2003). The majority of research has focused on massage therapy and its impact with respect to symptoms such as pain and/or distress (Gielissen, Verhagen, Witjes, & Bleijenberg, 2006; Listing et al., 2009; Post-White et al., 2003). However, these researchers used small sample sizes and participants from specific locations that underwent a specific dose (similar duration and frequency) of massage therapy (Hernandez-Reif et al., 2005). For example, Listing et al. (2009) used a sample size of 86 participants, Forchuk et al. (2004) used 59 participants, and Hernandez-Reif et al. (2005) assessed 58 participants.

In addition, these researchers found small to medium effect sizes (Sturgeon, Wetta-Hall, Hart, Good, & Dakhil, 2009). I conducted this study in order to assess whether massage therapy is significant in reducing pain and distress/anxiety across a larger and more heterogeneous sample (participants from multiple locations) as well as participants that received various dosages and types of this treatment. Doing so may allow for the generalization that massage therapy is effective in reducing pain and distress/anxiety across all populations and regardless of dosage of treatment. In addition, providing an effective treatment such as massage therapy may offer this population a potential to improve their quality of life.

Statement of the Problem

Pain, distress, and other symptoms are bound to occur from not only breast cancer itself, but the medical treatment associated with this particular illness (Tatrow & Montgomery, 2006). According to Chapman (2011), patients may experience pain resulting from treatment procedures such as chemotherapy, radiotherapy, or surgery. Goudas et al. (2005) identified that 73% of patients admitted into the hospital, communicate that they are experiencing pain. Tatrow and Montgomery (2006) indicated that at least 50% of all breast cancer patients struggle with psychological distress. Researchers have shown that individuals who undergo complementary treatments such as massage therapy may have positive improvements with respect to pain and distress associated with typical medical treatment for breast cancer (Post-White et al., 2003).

The majority of researchers have focused on massage therapy and its impact with regard to pain and distress in breast cancer patients (Hernandez-Reif et al., 2005; Listing et al. 2009; Post-White et al., 2003; Sturgeon et al., 2009). Researchers have indicated that despite their significant findings, larger sample sizes ought to be used in future studies to gain a better understanding of how effective massage therapy is with respect to pain and distress (Post-White et al., 2003). For instance, Hernandez-Reif et al. (2004) used 58 participants and Forchuk et al. (2004) assessed 59 breast cancer patients. Further, researchers examined populations from specific locations such as Berlin, Germany, Miami, Florida, South Thames, United Kingdom, Wichita, Kansas, and Minneapolis, Minnesota. Addressing this gap utilizing a heterogeneous sample of breast cancer patients as well as various dosages of massage therapy may allow for the ability to generalize that

massage therapy is effective across all breast cancer patients as well as all durations and frequencies of treatment (Sturgeon, 2009).

It is important to assess nonpharmacological options such as massage therapy that can be helpful in treating symptoms such as pain and distress/anxiety in breast cancer patients. Doing so improves quality of life and the ability to fight breast cancer more effectively. A meta-analysis that assesses whether massage therapy significantly improves pain and distress/anxiety across a larger and heterogeneous sample size, and across various durations of treatment may allow for a more significant result. In addition, this type of analysis may further allow the exploration of the generalization that massage therapy is effective in reducing pain and distress/anxiety across all populations and regardless of dosage of treatment.

Purpose of the Study

The purpose of this study was to explore the effectiveness of massage therapy for decreasing pain and distress/anxiety in a larger, heterogeneous population of breast cancer patients and across all durations and frequencies of treatment. I conducted this quantitative meta-analysis study method to assess the effectiveness of massage therapy and its influence on pain and distress/anxiety that results from breast cancer and the typical medical treatment of breast cancer. Findings were collected and analyzed from a number of recently conducted studies that assessed massage therapy and the levels of pain and distress/anxiety in breast cancer. The independent variable was the method of treatment (massage therapy) and the dependent variables were the levels of pain and distress/anxiety in breast cancer patients.

Research Questions and Hypotheses

The following research questions and hypotheses have resulted from reviews of present literature on massage therapy and levels of pain and distress in breast cancer patients. Additional information with regard to the description of the study will be reviewed in Chapter 3.

Research Question #1 . Based on former studies conducted on message therapy used to diminish pain in breast cancer patients, were significant differences evident when using a larger and heterogeneous sample size of breast cancer patients?

Alternative Hypothesis #1. It was predicted that massage therapy is significantly effective with respect to reducing or eliminating pain in a larger and heterogeneous sample size of breast cancer patients.

Research Question #2. Based on former studies conducted on massage therapy used to diminish distress/anxiety in breast cancer patients, were significant differences evident when using a larger and heterogeneous sample size of breast cancer patients?

Alternative Hypothesis #2. It was predicted that massage therapy is significantly effective with respect to significantly reducing or eliminating distress/anxiety in breast cancer patients when utilizing a larger and heterogeneous sample size of breast cancer patients.

Theoretical Foundation

The gate control theory of pain which was originally put forward by Ron Melzack and Patrick Wall in 1962, and assisted in the understanding of how massage therapy may be effective in altering pain perception in breast cancer patients. The theory proposes that

there are small nerve fibers located at the dorsal horn of the spinal cord, which can either inhibit or activate pain signals to the brain. According to Sagar, Dryden, and Wong (2007), massage therapy can create biochemical changes such as increasing local blood flow, which can influence pain perception. These biochemical changes may decrease pain perception, which may lead to a reduction in reported pain in breast cancer patients. Further, a reduction of pain may lead to a decrease in distress, as Irvin, Muss, and Mayer (2011) indicate that pain is one of the most common and distressing symptoms in cancer.

A theory proposed by Moyer, Rounds, and Hannum (2004) found that massage therapy acts much like psychotherapy and may improve a patients' ability to manage pain and distress/anxiety. It may be effective in reducing pain and distress in breast cancer patients in that the communication and interaction between therapist and patient, the participants' attitude towards treatment, and her belief that this treatment will bring about improvements in anxiousness and pain. This is known as the *therapeutic effect* (Listing et al., 2009).

Nature of the Study

In this study, I conducted a quantitative meta-analysis study method to assess the effectiveness of massage therapy treatment and its influence on the dependent variables pain and distress. The independent variable method of treatment was defined as a therapeutic intervention (massage therapy) used to reduce distress/anxiety and levels of pain. Findings were collected from a number of recently conducted studies assessing massage therapy and its effectiveness in treating pain and distress/anxiety in breast cancer

patients. These studies included various durations and frequencies of massage therapy, as well as breast cancer patients from various locations.

Because this was a quantitative study, statistical generalization was sought after. Former studies used small samples of breast cancer patients. Further, these studies, included homogenous breast cancer patients (breast cancer patients recruited from one specific location and receiving a specific form of massage therapy). Therefore, the use of numerous former studies increased the size of the sample and increased statistical significance. The use of a heterogeneous sample (breast cancer patients from various locations and receiving various types of massage therapy) allowed for the findings to be generalized to all breast cancer patients. Finally, conducting this study helped to determine the relative effects of massage therapy on pain and distress in breast cancer patients.

Definition of Terms

The following section contains definitions of variables and uncommon terminology utilized in the study.

Quality of life is a term utilized to describe an individuals' physical, social, and psychological wellbeing (Rietman et al., 2004, p. 79).

Psychological distress/anxiety can be defined as any psychological (emotional, cognitive, behavioral), social or spiritual characteristic that could potentially impede upon an individual's ability to adequately cope with cancer, the treatment of cancer, and the physiological symptoms associated with cancer (Roth et al.,1998).

Pain, with respect to breast cancer patients, is a physiological response that occurs from cancer, the treatment of cancer, or the blend of illness and treatment (Doyle, 2008).

Massage therapy is a treatment that involves applying pressure or manipulating soft tissue and/or muscle by a professional masseur, and can promote relaxation and healing, as well as improving physical functioning (Sturgeon, Wetta-Hall, Hart, Good, & Dakhil, 2009, p. 373).

Swedish massage is a type of full body massage that is customized for the patient's medical needs. Most often it includes massage oils and constitutes gliding strokes that are light and lengthened (Sturgeon et al., 2009).

Assumptions

In this meta-analysis study, I assessed massage therapy and its influence on pain and distress/anxiety experienced by a large sample of breast cancer patients from various locations. There is no known study, therefore I assumed that a meta-analysis on massage therapy and its influence on pain and distress/anxiety on a large sample of breast cancer patients from various locations had not yet been conducted. In addition, a meta-analysis is assumed to be beneficial in that it combines the findings of previous studies, increasing the sample size, thus producing results that are much more accurate (Borenstein, Hedges, Higgins, & Rothstein, 2009, p. 357). It was also assumed that the participants in the former studies reported accurately with respect to the effectiveness of massage therapy. It is possible that participants were biased and responded favorably after agreeing to partake in a study that could lead to improvements in pain and/or distress/anxiety.

Scope and Delimitations

This quantitative meta-analysis study involved previous studies conducted on breast cancer patients that reported pain and distress/anxiety associated with illness and medical treatments. I collected findings from a number of recently conducted studies conducted between June 2004 and April 2012. These studies were focused on breast cancer patients and the use of massage therapy in treating pain and/or distress/anxiety.

The independent variable method of treatment was defined as the therapeutic intervention (massage therapy) used to reduce distress/anxiety and levels of pain. Anxiety and distress were used interchangeably (same variable) in this study as they were defined similarly in the individual studies included. Using numerous former studies and a large sample size, as well as breast cancer patients from various locations and various durations and frequencies of massage therapy, helped to determine the influence of massage therapy on pain and distress. Further, it improved the ability to generalize these findings to a larger population of breast cancer patients.

I included only studies where researchers used massage therapy as a treatment method to decrease pain and/or distress/anxiety were included. Studies that included a form of massage therapy and defined massage therapy in a way that was also similar to the definition of massage therapy were also included. Breast cancer patients from various locations were included, as well as a variety of massage therapies with different frequencies and durations.

The inclusion of breast cancer patients from various locations (within many areas of the United States and outside of the United States) increased the ability to generalize

findings to all breast cancer patients. Further, breast cancer patients who received

massage therapy (various types of massage therapy as well as various durations and

frequencies of massage therapy) as a treatment were included. This increased the ability

to generalize that all types of massage therapy (Swedish massage, foot massage, hand or

arm massage, etc.) are effective with respect to reducing pain and distress/anxiety in

breast cancer patients. Any other complementary treatments or massage therapy that were

not similar to the definition utilized in this study were excluded from the study.

Limitations

A meta-analysis is assumed to be beneficial in that it combines the findings of

previous studies, increasing the sample size, thus producing results that are much more

accurate. However, a meta-analysis combining findings from studies that were conducted

differently, could lead to less reliable results (Borenstein, Hedges, Higgins, & Rothstein,

2009, p. 362). Further, since the studies included in the meta-analysis did not lack

reliability and validity, they did not impact the overall findings of the study. The findings

of this meta-analysis allowed for generalizations with respect to patients with breast

cancer however, it did not allow generalization with respect to other types of cancer

patients.

A potential bias that could alter the outcomes of the study is selection bias. It was

important that I included only those former studies that included massage therapy and its

influence on pain and/or distress/anxiety on breast cancer patients. In addition, previous

studies included small samples of breast cancer patients. Further, they used non-

homogenous breast cancer patients (breast cancer patients recruited from one specific

location and receiving a specific form of massage therapy). Using a large sample of breast cancer patients from various locations as well as patients that received various types of massage therapy allowed for the findings to be generalized to all breast cancer patients.

Lastly, the criteria for including studies in a meta-analysis could be influenced by my own knowledge of findings of the potential studies. This could lead to inclusion bias. In order to prevent inclusion bias, I considered including all former studies that related to massage therapy, and its influence on pain and distress/anxiety in breast cancer patients. Studies that were excluded were those were focused on other forms of cancer, did not involve pain and/or distress/anxiety as a result of breast cancer or breast cancer treatment, studies conducted prior to 2003, and nonpharmacological treatments that did not meet the above stated criteria for massage therapy (i.e., reflexology, hypnosis, cognitive behavioral therapy, social support, etc.).

Significance

Conducting a meta-analysis on massage therapy and its influence on pain and distress/anxiety in breast cancer patients may add to the field of psycho-oncology. The study included studies where researchers assessed breast cancer patients from various locations and various durations and frequencies of massage therapy. This allowed the findings to be generalized to all breast cancer patients and across various durations and frequencies of massage therapy. Moreover, increasing the sample size (through meta-analysis) improved the ability to detect statistical significance.

Social Change

Improving the management of pain and distress/anxiety in a larger sample size of breast cancer patients from various locations and across various durations and frequencies of massage therapy could lessen any additional costs to the healthcare system or the need to ingest pain or distress/anxiety medication. Reducing the amount of additional medication could reduce additional symptoms or side effects associated with pain and distress/anxiety medication. More importantly, reducing or eliminating pain and/or distress/anxiety in breast cancer patients through the usage of massage therapy could improve a breast cancer's overall quality of life.

Summary

Previous researchers have investigated the effects of massage therapy on a patient's psychological state and reduction in physical pain; however, a study that includes a larger sample size, and assesses breast cancer patients from various locations treatment frequencies and durations can help in gaining more reliable outcomes. Further, it a meta-analysis may improve the ability to generalize the fact that massage therapy is effective in reducing pain and distress/anxiety in breast cancer patients from various locations and across various durations and frequencies.

In Chapter 2, I focus on current literature that relates to the use of massage therapy and its influence on symptoms of pain and distress/anxiety in breast cancer patients. Further, Chapter 2 includes the theoretical foundation.

Chapter 2: Literature Review

Introduction

Cancer treatment can not only cause states of fear, depression, and distress/anxiety for many cancer patients, but it can also be physically painful. Former studies suggest that complementary treatments assist cancer patients develop their coping skills and reduce their fear of pain (Reaves & McManis, 2010) and actual pain that results from illness and treatment (Raphael et al., 2010). According to Reaves and McManis (2010), patients who received alternative or holistic approaches in addition to medical treatment reported a decrease in fear and pain severity. Gielissen, Verhagen, Witjes, and Bleijenberg (2006) found that patients reported lower levels of psychological distress.

Symptoms such as pain and distress are bound to occur from not only breast cancer itself, but the medical treatment associated with this particular illness (Tatrow & Montgomery, 2006). Previous research has found that individuals who undergo complementary treatments such as massage therapy may have a positive influence with respect to pain and distress/anxiety associated with typical medical treatment for breast cancer (Post-White et al., 2003).

The majority of previous research has focused on massage therapy and its influence on pain and distress in breast cancer patients. However, these former studies used small sample sizes (Post-White et al., 2003), homogenous populations, and had small to medium effect sizes. Further, these previous studies have reported that despite their significant findings, larger sample sizes should be used in future studies to gain a better understanding of how effective massage therapy is with respect to pain and

distress/anxiety (Post-White et al., 2003). Additionally, former studies used populations from specific locations (Listing et al., 2009). The purpose of this study was to address this gap. Utilizing a heterogeneous sample of breast cancer patients (studies that included patients located from various locations) as well as various dosages and types of massage therapy allowed for the ability to generalize that massage therapy was effective across all breast cancer patients as well as all durations and frequencies of treatment (Sturgeon, 2009). The purpose of this study was to explore the effectiveness of massage therapy for decreasing pain and distress/anxiety in a larger, heterogeneous population of breast cancer patients and across all durations and frequencies of treatment.

The following literature review presents a clear understanding of the effectiveness of massage therapy with respect to the levels of pain and distress reported by breast cancer patients. This review begins with the extent of the problem of pain in breast cancer patients followed by the extent of the problem of distress/anxiety in breast cancer patients. Immediately following will be a discussion on the effectiveness of massage therapy with respect to levels of pain and distress/anxiety. Following, will be a discussion with regard to the influence of massage therapy on pain and distress/anxiety in cancer patients in general, and then continues by discussing the effectiveness specifically in breast cancer patients. Finally, a detailed explanation of the theoretical foundation associated with this study is presented.

Literature Search Strategy

I searched PsychINFO, MEDLINE, PsycARTICLES, and CINAHL, from 1984 to 2013, using the following terms: *breast cancer, breast neoplasms, cancer, pain, distress,*

anxiety, massage therapy, therapeutic massage, healing touch, reflexology, foot massage relaxation, treatment outcome, and *meta-analysis.* The search engine was set to recognize various types of studies ranging from randomized controlled trials to pilot studies, to cross over designs printed in English. Further, sources were located from literature reviews and meta-analyses that addressed massage therapy and symptoms of physical discomfort, pain, distress, mood disturbance, anxiety, stress, and tension in breast cancer patients. Lastly, sources from unpublished studies, former dissertations, professional conferences, as well as findings from the National Cancer Institute at the National Institute of Health were also searched.

Theoretical Foundation

Gate Control Theory

The gate control theory was originally put forward by Melzack and Wall (1962) and pertains to the experience of pain. This theory suggests that pain is either experienced or prevented through nerve fibers that are located at the rear of the spinal cord (Sagar, Dryden, & Wong, 2007). When pain travels to the spine, pain is either allowed to enter through the gates, travel to the brain, and is experienced, or the gates are closed and the pain does not reach the brain, and is not experienced (Melzack, 1993).

According to Melzack (1993), stimulation of the large fibers prevents transmission, whereas the stimulation of small fibers allows the transmission of pain signals. In addition, psychological factors may also play a role in the experience of pain (Melzack, 1993). Since wide-dynamic-range (WDR) cells which are located in the dorsal horn of the brain are a necessary component in the sensation of pain and is influenced by

tactile sensitivity, it is of no surprise that the gate control theory argues that pressure,

squeezing or light touch to the skin may influence the perception of pain (Craig, 2003).

In addition, Sagar, Dryden, and Wong (2007), indicate that massage therapy can

alter biochemical processes, which in turn, could influence blood flow and the sensation

of pain. These biochemical processes create neural activity at the spinal cord, which may

alter the functioning of the subcortical nuclei and limbic system, leading to changes in the

awareness of pain (Sagar et al., 2007). This is consistent with The gate control theory of

pain, which suggests that the manipulation of muscles influences neural activity and

blood flow along with a release of endorphins, serotonin and dopamine (Field, 1998).

Theory Associated with Psychotherapy

A theory proposed by Moyer, Rounds, and Hannum (2004) suggested that

massage therapy acts much like psychotherapy in that factors such as the communication

and interaction between therapist and patient, the participants' attitude towards massage

therapy, and her belief that massage therapy will bring about improvements in

anxiousness/distress and pain. This is known as the *therapeutic effect* (Moyer, Rounds,

and Hannum, 2004). Listing et al. (2009), Moyer et al. (2004), and Hyland (2005) have

all assumed that the benefits of massage could most likely be due to the interaction

between therapist and patient.

Assessing how effective massage therapy is in reducing unwanted side effects

such as pain and distress/anxiety associated with breast cancer or breast cancer treatment,

may improve an individuals' quality of life. Further, it could reduce the need for

additional medical treatment (pharmaceuticals to reduce pain and distress). In addition, it

adds to existing research in that it allows us to generalize findings to a larger population of breast cancer patients (U.S. and non-U.S. residents) and massage therapy that is provided across various durations and frequencies.

Theory Associated with Physical Touch

According to studies conducted by Field (1998) and Modi and Glover (1995), physical touch may decrease cortisol levels and increase serotonin in premature infants. Further, that physical touch may improve weight gain and immune function and decrease pain and anxiety and stress (Field, 1998). It is possible that an increase in serotonin levels may prevent noxious nerve signals from reaching the brain (Field, 1998). Preventing noxious nerve signals from reaching the brain may decrease symptoms of pain and distress/anxiety.

The Need for Complementary Treatment of Breast Cancer

According to Greisinger, Lorimor, Aday, Winn, and Baile (1997) and Ferrell, Dow, Leigh, Ly, and Gulasekaram (1995), there is a relationship between poor quality of life and function in cancer patients and symptoms of anxiety/distress and pain. Dausch, Compas, Beckjord, Luecken, Anderson-Hanley, Sherman, and Grossman (2004), indicated that symptoms of anxiety/distress can influence function and overall wellbeing in newly diagnosed cancer patients.

Pain symptoms and chronic pain syndromes that result from cancer and/or medical treatment for cancer, may impact a patients' quality of life (Chapman, 2011) Further, survivors of cancer have reported an overall decline in health and wellbeing in contrast with the patients without cancer (Chapman, 2011). Failure to manage long-term

symptoms may not only cause additional stress on cancer survivors, but it could also significantly impact the healthcare system (Chapman, 2011).

Pain

According to Goudas et al. (2005), pain is not only the most prevalent symptoms associated with cancer but, it is also the most disturbing. Doyle (2008) defines cancer related pain as a physiological response that may occur from breast cancer, the treatment of breast cancer, or the blend of breast cancer and treatment (Doyle, 2008).

Patients may experience pain resulting from treatment procedures such as chemotherapy, radiotherapy, or surgery (Chapman, 2011). For instance, tissue damage could result from surgical procedures, chronic pain may occur when initial post-operative pain is not treated properly, and skin irritation may be an outcome of radiation treatment (Chapman, 2011). Additionally, surgery may alter or cause dysfunction in an individuals' peripheral and/or central nervous system. If these alterations persevere, a patient may be left with post-surgical pain syndromes (chronic pain), which will most often impede upon her quality of life (Chapman, 2011).

According to Lee, Kilbreath, Refshauge, Herbert, and Beith (2008), in the years prior to 2006, between 9% and 68% of breast cancer patients reported the occurrence of arm and shoulder pain and 15% to 72% experienced breast pain anywhere from five to 56 months post surgery. Goudas et al. (2005) identified that 73% of patients admitted into the hospital, communicate that they are experiencing pain. According to Ewertz and Jensen (2011), 30-50% of breast cancer patients undergoing radiotherapy or breast cancer surgery experience relentless pain in areas such as the breast, shoulder, and arm.

Bishop and Warr (2003) recognized that cancer patients cope with pain by using the same coping strategies that non-cancer patients cope with pain. When experiencing pain, cognitive and behavioral approaches are used to cope with intense levels of pain (Bishop & Warr, 2003). Active coping techniques are those that involve the patient being an active participant in managing the pain, whereas passive coping involves the patient looking to others to assist them in coping with pain (Bishop & Warr, 2003). According to Holmes and Stevenson (1990), those patients that opt to utilize active coping strategies, experience a reduced level of pain in comparison to those that choose to cope using passive strategies. While pain is much more likely to occur during post surgical treatment, chemotherapy, and radiation, it may become more severe when the patient is unable to cope properly, or is experiencing feelings of anxiety or distress (Chapman, 2011). Should patients be provided with proper pain management through the usage of complementary treatments, post treatment chronic pain syndromes may be less likely to occur, and the overall intensity of pain may be lessened (MacIntryre & Schug, 2007). Proper pain management will be more effective if patients with pain are assessed immediately after typical medical treatment.

Psychological Distress/Anxiety

The diagnosis of cancer is considered an extremely taxing or stressful occurrence that commonly brings on an enormous amount of worry, anxiety, depression, and psychological distress (Ryan et al., 2005). According to Roth, Kornblith, Batel-Copel, Peabody, Scher, and Holland (1998) psychological distress can be defined as any psychological (emotional, cognitive, behavioral), social, or spiritual characteristic that

could potentially impede upon an individual's ability to adequately cope with cancer, the treatment of cancer, and the physiological symptoms associated with cancer. Common factors that are connected to psychological distress are fear of dying and worry (Ganz, 2008), pain, fatigue, disruption of sleep (Stone & Minton, 2008), and being of younger age (Kornblith et al. 2007; Mertz, Bistrup, Johansen, Dalton, Deltour, Kehlet, & Kroman, 2012).

Psychological distress or feelings of anxiety may be a symptom that occurs in cancer patients as they attempt to cope with the diagnosis (Irvin, Muss, & Mayer, 2011). Distress may reveal itself as other symptoms such as depression and anxiety (Warren, 2010). It could also result in a lack of control or fear with regard to physical functioning (Warren, 2010). Tatrow and Montgomery (2006) indicated that at least 50% of all breast cancer patients struggle with psychological distress. Breast cancer patients that experience distress may sense sadness, uneasiness, fear, or far more impairing forms of distress such as depression and/or anxiety (National Comprehensive Cancer Network Distress Management Panel, 2005).

Ryan, Schofield, Cockburn, Butow, Tattersall, Turner, and Bowman (2005), identified that emotional distress in cancer patients can be extremely difficult to identify. Medical clinicians often rely on a patient's verbal or non-verbal communication when identifying a patient's ability to cope with cancer diagnosis and/or cancer treatments (Ryan et al., 2005). A cancer patient's nonverbal communication may be overlooked by medical professionals that are not highly trained in recognizing emotional cues of distress (Ryan et al., 2005). Should nonverbal cues such as poor posture, lack of movement, or

distressed tone be over-looked and untreated, psychological distress could result in persistent feelings of fear, distress, and depressed mood that could impede upon the overall functioning of the patient (Ryan et al., 2005). Therefore, it is imperative that patients not only communicate psychological symptoms associated with cancer treatments to their doctors, but that medical personnel become skilled at detecting psychological and physiological symptoms that could results from feelings of distress, and non-verbal cues that could suggest distress (Ryan et al., 2005).

Symptoms related to distress may also include fatigue, gastrointestinal issues, chronic pain, or nausea (Ryan et al., 2005). Considering these symptoms may also be a result of typical medical cancer treatments, it is not uncommon that these symptoms of distress in cancer patients are frequently unnoticed (Ryan et al., 2005). The appropriate treatment for psychological distress in cancer patients is essential so that psychological health improves (Ryan et al., 2005). Moreover, the treatment of psychological distress will assure that the patient has a greater advantage with respect to recovery (Ryan et al., 2005).

Greer (2008) speculated that the way in which a patient copes with or appraises the diagnosis is contingent upon how they respond emotionally. Those that are unable to cope in a positive fashion may be more susceptible to distress (Greer, 2008). Further, a patients' attitude in relation to their situation may affect the way in which they reveal or communicate feelings of fear (Ryan et al., 2005). Some patients may be ashamed to admit they are struggling with psychosocial issues as this makes them appear to be weak and unable to cope (Ryan et al., 2005).

Since former researchers suggest that psychological symptoms such as distress (Ryan, Schofield, Cockburn et al., 2005) and physiological difficulties such as pain Goudas, Bloch, Gialeli-Goudas, et al. (2005) are common in cancer patients, and symptoms of distress and pain impede upon a breast cancer patients' coping and quality of life (Tatrow & Montgomery, 2006), there is certainly a need to both detect and treat these particular symptoms.

Complementary Treatments

It is approximated that over 80 million Americans opt to use some form of complementary treatment for either malignant or nonmalignant illnesses (Hensel, Zoz, and Ho (2009). Many people choose to try complementary treatments when medical or traditional treatments have been implemented (Hensel, Zoz, and Ho, 2009). Evidence with respect to the improvements of physical and emotional problems in breast cancer patients is becoming more apparent (Harrington, Baker, & Hoffman, 2012), however the benefits with respect to psycho-oncologic treatments for cancer patients continues to be unclear (Faller, Schuler, Richard, Heckl, Weis, and Kueffner, 2013). Some reasons for these mixed results are that former researchers used small sample sizes or particular subpopulations, which makes it difficult to generalize findings and make a final determination (Faller et al., 2013).

Complimentary Treatments for Breast Cancer

Breast cancer is a prevalent cancer today, but medical treatments have flourished, leaving many survivors with unwanted symptoms (Janz, Mujahid, Chung, Lantz, Hawley, Morrow, & ... Katz, 2007). Unfortunately, survivors fail to receive adequate treatment

once the initial treatment phase has completed, which negatively impacts recovery and quality of life (Janz et al., 2007).

Approximately 73% of breast cancer patients suffer from pain (Irvin, Muss, & Mayer, 2011). Pain can be a result of tissue damage or poor functioning of the nervous system (Treede et al., 2008). Moreover, surgical procedures such as mastectomy followed by radiation along with chemotherapy is most often associated with pain, a diminished range of motion in the shoulder, as well as numbness in areas of the body and an overall diminished quality of life (Rietman, Dijkstra, Debreczeni, Geertzen, Robinson, & De Vries, 2004). Quality of life is impaired in that these symptoms impede upon the ability to carry out daily living skills (Rietman et al., 2004). The inability to carry out such skills may affect an individuals' physiological, psychological, and social wellness (Rietman et al., 2004).

Insufficient treatment of symptoms and feelings of anguish negatively impacts a breast cancer survivors' ability to socially reintegrate (Northouse, Templin, & Mood, 2001). Additional symptoms such pain are known to follow just one year after initial breast cancer treatment (Janz et al., 2007). A study conducted by Hartl et al. (2003), indicated that breast cancer patients reported symptoms of pain as much as four years post treatment. Therefore, it is crucial that future studies examine the most efficacious treatments options for symptoms such as pain and distress/anxiety that result after initial breast cancer treatment.

Research and treatment pertaining to unremitting side effects that result from breast cancer treatment have been scarce for a various reasons (Ewertz & Jensen, 2011).

The first and most obvious reason is that the top priority is to cure the patient of cancer and any follow up physician visits are intended to identify potential recurrence (Ewertz & Jensen, 2011). In addition, Ewertz and Jensen (2011) indicate that there is a lack of evidence with respect to efficacious interventions that treat breast cancer symptoms.

Lastly, treating symptoms such as pain and distress/anxiety that result from medical treatments are often not applicable to the field of oncology (Ewertz & Jensen, 2011). In order for oncologists to treat symptoms associated with breast cancer, further education and training is necessary (Ewertz & Jensen, 2011). Ewertz and Jensen (2011) indicate that additional recovery or treatment may also increase healthcare usage and costs. That being said, it should also be argued that untreated breast cancer survivors may lead to additional communal concerns such as early retirement, failure to carry out full time employment, and raise mortality rates (Ewertz & Jensen, 2011).

Khatcheressian et al. (2006) argue that if patients were to comply with follow up treatment, the outcome would involve lower costs in comparison to those that did not participate or comply with follow-up interventions.

Massage Therapy

Massage therapy is a treatment that involves applying pressure or manipulating soft tissue and/or muscle by a professional masseur, and can promote relaxation and healing, as well as improving physical functioning (Sturgeon, Wetta-Hall, Hart, Good, & Dakhil, 2009). In general, this therapeutic approach has been used to assist in relieving symptoms of fatigue, pain, anxiety/distress, nausea, and depression (Reaves & McManis, 2010). Massage therapy can be applied to either the entire body or more specifically to

one body part such as the feet or hands. Moreover, the dosages of massage therapy can be

provided in short or long durations and is considered relatively simple and noninvasive

(Reaves & McManis, 2010). The following diagram illustrates how massage therapy may

decrease pain and distress/anxiety due to illness and treatment (See Diagram 1).
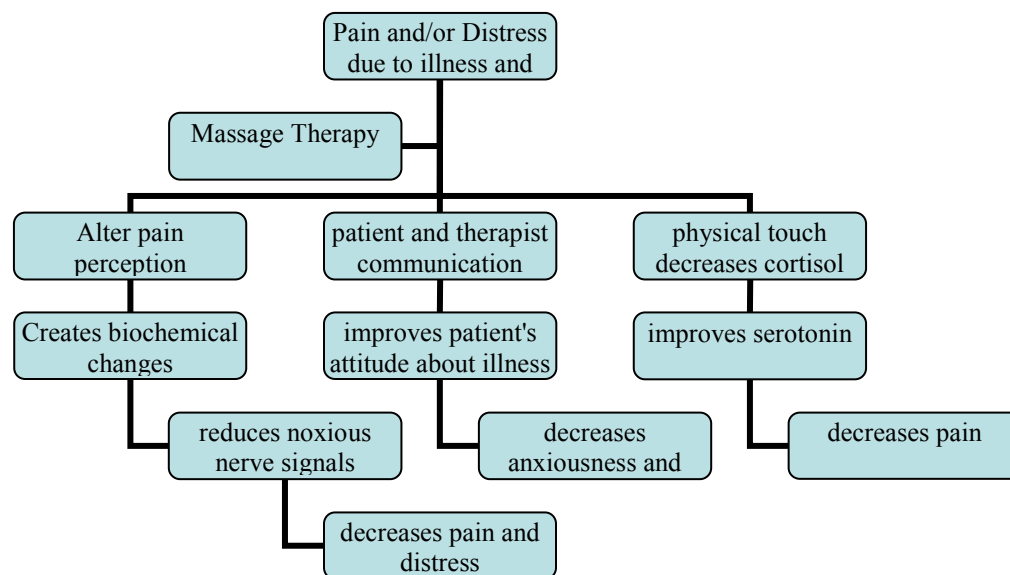
Figure 1. Note: A sample diagram illustrating how massage therapy may decrease pain
and distress/anxiety.

Effects of Massage on Pain

      Several studies have demonstrated improvements in pain associated with massage

therapy. In a multisite, randomized clinical trial study, Kutner et al. (2008) assessed

massage therapy and simple touch and improvements on pain in cancer patients. Patients

participating in the study were experiencing moderate to severe pain and randomly

assigned to either the treatment group (massage therapy) or a control group (simple

touch). Despite the quick and favorable finding that massage therapy has on experienced

pain (in comparison with simple touch), the lack of sustained effects indicates that a need

for more effective methods to diminish pain is necessary (Kutner et al., 2008). Further,

the study used unblinded study therapists which could have resulted in reporting bias and

magnified favorable effects (Kutner et al., 2008). In addition, both simple touch and

massage therapy resulted in improvements with respect to pain experienced, and

therefore it is a possibility that the interaction between participant and study therapist

may have added to or caused the positive findings (Kutner et al., 2008).

According to Joske et al. (2006), there is still a great need for both short-term and

long-term effects of massage therapy as well as different types of massage therapy.

Cassileth and Vickers (2004) assessed cancer patient's levels of pain when being treated

with three different types of massage; Swedish, light touch, and foot massage. In

addition, treatment durations ranged from 20 minutes to 60 minutes and pain was

assessed prior to and post therapy. Those patients that received Swedish and light touch

massages benefited more than those that received foot massages and overall, patients.

The researchers of this particular study found significant improvement with respect to

levels of pain (reduction in pain experienced by 50% (Cassileth & Vickers, 2004).

Moreover, that the improvements lasted for two days post treatment (Cassileth &

Vickers, 2004). While the findings suggest significant improvements on levels of pain in

cancer patients, the participants were gathered from a cancer center and therefore the

findings cannot be generalized to cancer patients from various environments.

Various researchers such as Cassileth & Vickers (2004) and Kutner et al. (2008)

indicate that massage therapy is effective in reducing pain in cancer patients; however the

ability to generalize to all cancer patients is difficult when selecting participants from one specific location. Further, since massage therapy involves close physical contact between patient and therapist and because massage therapy also involves communication and attention from the therapist, it is possible that beneficial effects are not due to the treatment alone, but the interaction between therapist and patient as well.

Various researchers have also shown mixed findings with respect to massage therapy and its influence on pain in breast cancer patients. In a small study conducted by Pruthi et al. (2009), breast cancer patients were offered complimentary massage at the breast diagnostic clinic immediately following their visit. Sixty-three patients participated and were asked to complete surveys to assess the effectiveness of massage. These surveys were constructed by the clinics marketing staff and were not tested prior to their usage (Pruthi et al., 2009). Statistical significance was not obtained as the survey asked if the treatment was either, very effective, somewhat effective, not very effective, or not at all effective (Pruthi et al., 2009). Since the researchers of this study utilized a small and homogenous sample, was not able to statistically identify significance, and participants were well aware of the potential benefits of massage therapy, it is difficult to determine whether or not massage therapy is effective in reducing pain in breast cancer patients. Further, it is difficult to generalize findings to all breast cancer patients. Rather, the researchers of this study were able to identify massage therapy as a complementary treatment that may be of interest to breast cancer patients and may reduce levels of pain (Pruthi et al., 2009).

Similarly, in a small sample-sized pilot study, Sturgeon et al. (2009) assessed the effects of therapeutic massage on pain in breast cancer patients. Massage therapy was implemented weekly for three consecutive weeks and while improvements in pain were noted, they were non-significant (Sturgeon et al., 2009). Sturgeon et al. (2009) indicated that the small sample size used and the absence of a control group were clear weaknesses in this study. Moreover, three massage treatments (one per week for 30 minutes) were given, which made it difficult to assess effectiveness, and the researchers relied on self-report responses, which may have increased the chances of measurement bias (Sturgeon et al., 2009). Lastly, Sturgeon et al. (2009) informed the reader that since massage therapy and radiation were administered simultaneously, changes in reported levels of pain could be a result of either the application of massage therapy or the termination of radiation.

Improvements in pain were significant in a pilot study conducted by Drackley et al. (2012). Breast cancer patients that underwent a mastectomy were recruited at a busy hospital practice and offered massage therapy by massage therapists with a physical therapy background (Drackley et al., 2012). Participants were informed of the pilot study and were given a pamphlet with the possible benefits of massage therapy (Drackley et al., 2012). Unlike the other studies mentioned above, the researchers of this study informed participants that they would be charged a small fee for the intervention (Drackley et al., 2012). The treatment was customized to meet the needs of each patient (Drackley et al., 2012). Similar to Pruthi et al. (2009), Drackley et al. (2012) administered a pre- and post-test assessment to evaluate patients' improvements with respect to pain. The study

conducted by Drackley et al. (2012) was also comparable to the study conducted by Sturgeon et al. (2009) in that a control group was not included in the study.

While the researchers' findings suggested that pain was significantly reduced through the use of massage therapy, the researchers informed patients of the potential benefits of massage prior to the application of the treatment, it used a small sample size, and included only those patients that received surgery at one specific hospital practice. The small sample size and homogenous sample size makes it difficult to generalize its findings to all breast cancer patients and informing patients of the potential benefits may have lead to report bias. A noted strength of the study was that various other studies were conducted in the same hospital practice for participants that underwent other forms of surgery and also found significant improvements with respect to pain (Drackley et al., 2012).

Significant results with respect to pain experienced by breast cancer patients that received massage therapy as a form of intervention were also found in a study conducted by Listing et al. (2009). The researchers of this particular study used eighty-six early stage breast cancer patients that were experiencing physical discomfort that included pain (Listing et al., 2009). Unlike the abovementioned studies conducted on this topic, Listing et al. (2009) randomized participants into either the treatment group (massage therapy) or control group. Participants in the intervention group received massage therapy bi-weekly for five weeks at 30 minutes per intervention and the control group received nothing more than the routine healthcare (Listing et al., 2009). Pain levels were assessed via valid

questionnaires at the start of the study, after five weeks of intervention, and again at 11 weeks post intervention (Listing et al., 2009).

While Listing et al. (2009) did find significant results with respect to reduced discomfort and pain at the end of the intervention period, after six weeks post-intervention, and after 11 weeks post intervention, there were methodological limitations (Listing et al., 2009). Unlike the abovementioned studies, Listing et al. (2009) compared massage and control groups of differing sample sizes. This apparently occurred as some participants chose not to participate in the study (Listing et al., 2009). Because the control group was much smaller in size in comparison to the intervention group, this caused a lower power in the statistical comparisons (Listing et al., 2009).

It is evident that researchers of the studies that assessed the influence of massage therapy on pain experienced by breast cancer patients continue to be unclear. Researchers of the studies that found significant results also demonstrated weaknesses such as using small and homogenous sample sizes. Further, the researchers of many of the studies mentioned, informed patients of the purpose of the study as well as the potential benefits of the treatment, which may have biased the participant's reported levels of pain.

Effects of Massage on Distress/Anxiety

According to the National Certification Board of Therapeutic Massage and Bodywork (2007), massage therapy not only improves a patients' ability to relax, but it is also effective in improving stress and anxiety levels. Researchers of several studies have demonstrated improvements on distress/anxiety associated with massage therapy (Hernandez-Reif et al., 2005; Sturgeon et al., 2009).

In an abovementioned study conducted by Kutner et al. (2008), advanced cancer patients levels of distress were assessed after receiving either simple touch or massage therapy. The researchers indicate that the study found that both groups (simple touch and massage therapy) demonstrated statistically significant improvements with respect to physical and psychological symptoms of distress (Kutner et al. (2008). Additional studies conducted on cancer patients that evaluated the effectiveness of massage therapy on distress/anxiety include a study conducted by Cassileth and Vickers (2004). This study was mentioned above and found that massage therapy improved symptoms of anxiety.

With respect to the influence of massage therapy on distress in breast cancer patients, an abovementioned study conducted by Pruthi et al. (2009) indicated that participants reported improvements with respect to reducing muscle tension and in helping them relax. Since Pruthi et al. (2009) used a small and homogenous sample, it was unable to statistically identify significance, and participants were informed of the possible benefits of massage therapy, it is difficult to ascertain if massage therapy is effective in reducing pain in breast cancer patients. Further, it is difficult to generalize the findings to all breast cancer patients.

Drackley et al. (2012) found that the effectiveness of massage therapy on distress in breast cancer patients were similar to those assessing pain. While participants did report a significant decrease in stress and improved relaxation, the study used a small and homogenous sample. Furthermore, the study was clearly explained to the participants prior to the start of treatment, which may lead to report bias (Drackley et al., 2012). Lastly, Drackley et al. (2012), used only those patients that recently underwent

postsurgical mastectomy recipients recruited from one hospital practice. Therefore, it could be hard to generalize these findings to other breast cancer patients. A notable strength of the pilot study conducted by Drackley et al. (2012), was that additional studies were conducted in the same hospital practice for participants that underwent other types of surgery, and also found significant findings with respect to distress.

As noted above, Sturgeon et al. (2009) used a small sample to assess massage therapy on pain. Sturgeon et al. (2009) evaluated the effectiveness of massage therapy on levels of distress and although breast cancer patients reported improvements, they were non significant (Sturgeon et al., 2009). Weaknesses of the study include the small sample size, the short duration of treatment, and potential report bias (Sturgeon et al., 2009).

Dissimilar to the studies conducted by Pruthi et al. (2009), Drackley et al. (2012), and Sturgeon et al. (2009), an aforementioned study conducted by Listing et al. (2009) used a larger sample size. The effectiveness of massage therapy on mood disturbances such as anxious depression in breast cancer patients was assessed. Participants reported lower levels of mood disturbance in comparison to the control group, however due to the uneven group sizes, the power of the study was significantly lowered (Listing et al., 2009).

Additional researchers that evaluated pain and distress/anxiety in breast cancer patients receiving medical treatments found positive outcomes after undergoing massage therapy. For example, various randomized studies conducted by the University of Texas MD Anderson Cancer Center (2008) found that massage therapy improves a cancer patient's ability to relax, reduces pain, and enhances quality of life.

Summary

Breast cancer patients may experience pain and distress/anxiety-related symptoms, which may further impede upon a patients' quality of life. The abovementioned studies indicate that pain and distress/anxiety can not only be uncomfortable, but it can impede upon the patients' ability to carry out daily living skills which can further impact the patients' psychological and physiological well being. Former researchers have shown that the implementation of massage therapy may lead to a decrease in pain and distress/anxiety associated with standard breast cancer treatments. However, due to mixed findings, the use of small and homogenous sample sizes, and various dosages of the treatment, the effectiveness of massage therapy across breast cancer patients from various locations and with diverse dosages of treatment still remained unclear.

Conducting a meta-analysis that included a larger and heterogeneous sample of participants and various dosages of treatment assisted in gaining a better understanding of how effective massage therapy is in reducing pain and distress/anxiety in breast cancer patients. In addition, it allowed for generalization across various dosages of treatment and participants from various locations.

Chapter 3 focuses on the providing a complete explanation of the design, justification, measurements used, and extensive analyses of the data.

Chapter 3: Research Method

Methodology

The purpose of this study was to explore the effectiveness of massage therapy for decreasing pain and distress/anxiety in a larger, heterogeneous population of breast cancer patients and across all durations and frequencies of treatment. I used the quantitative meta-analysis study method to assess the effectiveness of massage therapy on pain and distress/anxiety that results from breast cancer and the typical medical treatment of breast cancer.

In Chapter 3, I provide a clear and concise description of the research and design, population, the collection of data, the nature of the treatment/intervention that I used, the variables included, justification of the effect size, alpha level chosen, and the power level chosen. A description of the instruments that I used in the former studies that were included in the study, along with their reliability and validity, and those who developed the instruments are also discussed. In addition, how each variable is operationalized and manipulated, as well as what the scores mean is discussed. The analysis of data using comprehensive meta-analysis (CMA) software, threats to validity, and any ethical concerns related to the study are thoroughly explained.

Research Design and Rationale

The study variables that were examined include massage therapy (independent variable), and pain and distress (dependent variables). A meta-analysis was conducted to gain a better understanding of the influence of massage therapy on pain and distress/anxiety in breast cancer patients. Findings from previous research conducted on

these particular variables were pooled, thus increasing the population sample size, which summarized and integrated findings from various individual studies. In this study, I evaluated differences within various individual studies, which improved the ability to detect effects and generalize findings. Further, conducting this meta-analysis provides more information with respect to what still needs to be assessed in potential future studies related to this topic.

The studies that were included within the meta-analysis were from the years 2004 to 2012. According to Borenstein, Hedges, Higgins, and Rothstein (2009), a meta-analysis is the statistical combination of findings from a number of studies. A meta-analysis is an acceptable choice when assessing the effectiveness of massage therapy on pain and distress/anxiety in breast cancer patients as this design may provide us with the ability to gain a vigorous effect (or effect size) across all of the populations and treatment dosages included as well as the ability to approximately calculate the significance of the effect much more accurately than by utilizing only one study (Borenstein et al., 2009).

Inclusion and Exclusion Criteria

In this meta-analysis, I investigated the relationship between the usage of massage therapy and levels of pain and distress/anxiety in breast cancer patients. The studies that I included for the current meta-analyses study were chosen pending on the following inclusion criteria:

1. A publication date between January 1, 1984 and December 31, 2013. Studies outside of these dates were excluded.

2. The study had to be printed in English.

3. The study had to be focused on investigating the relationship between massage therapy (i.e., Swedish massage, classical back and neck massages, arm massages, full body massage, foot/leg massage, and hand/lower arm massages) and at least one of the dependent variables (ie., pain and/or distress/anxiety resulting from breast cancer or medical treatment for breast cancer) in all stages of breast cancer patients residing in and outside of the United States. The criterion was not met if the researchers utilized other forms of non-pharmacological treatment for pain and distress/anxiety (i.e., reflexology, hypnosis, cognitive behavioral therapy, social support). The study was not included if the researchers assessed pain and distress/anxiety in patients with other forms of cancer (i.e., colon cancer, prostate, lung, etc.). Anxiety and distress were used interchangeably (same variable) in this study as they were defined similarly in the individual studies included.

4. The researchers had to use massage therapy as a form of treatment to decrease pain and/or distress/anxiety.

5. The study was included if it met the following criteria for massage therapy: massage therapy is a treatment that involves applying pressure or manipulating soft tissue and/or muscle by a professional masseur, and can promote relaxation and healing, as well as improving physical functioning (Sturgeon, Wetta-Hall, Hart, Good, & Dakhil, 2009).

6. Massage therapy in all durations (i.e., 20 or 30-minute sessions) and

frequencies (i.e., weekly, bi-weekly, and 2 to 3-times throughout the study)

were included.

7. The study had to be a quantitative study. Qualitative studies were excluded.

8. A study was included if it reported the effect size statistic or other statistic (e.g.,

means and standard deviations, *F*-statistic, *p*-value) suitable for calculating a

statistical significance.

The inclusion criteria stated, provided a comprehensive screening procedure that

determined whether or not a potential study was incorporated into the meta-analysis.

Potential studies were excluded if the following were evident:

1. The findings were not the result of reliable assessment tools.

2. The authors failed to provide sufficient data that allowed for meaningful

calculation or conversion of the effect size (standard deviations and means).

3. Common independent and dependent variables were not reported.

4. The researchers included fewer than ten participants. Too few participants may

lead to methodological concerns about the study having too little power to

adequately identify an effect.

5. The researchers assessed breast cancer patients along with additional cancer

patients. The findings of these studies could not be generalized specifically to

breast cancer patients.

Seven studies met the inclusion criteria and were included in the meta-analysis

study.

Setting and Sample

The sample of this meta-analysis signified the set of participants for the studies that met the inclusion criteria for this study. Additional analyses of the population and settings of the included studies are presented in detail in Chapter 4.

Sampling and Sampling Procedures

The sampling strategy that utilized in this meta-analysis was the strategy that was used within each former study. I looked for studies that utilized randomized sampling in order to place subjects into groups. Randomized sampling allows for equal sampling of the population, which reduces the probability of bias (Borenstein et al. 2009, p. 209). It should be noted that samples had already been drawn for each study included and the selection for each study was selected only if they met the criterion of the study.

Again, those studies included were similar with respect to the participants included (must have been breast cancer patients reporting pain and/or distress/anxiety), as well as the methodology, power, and effect size that I used. Anxiety and distress were used interchangeably (same variable) in this study as they were defined similarly in the individual studies included. With respect to the justification of the effect size, alpha level, and power level chosen, a p value of less than 0.05 was considered significant. In addition, the sample size was calculated depending upon whether or not the studies met the criteria as indicated in this meta-analysis.

Intervention

Since this was a meta-analysis, the interventions had already been conducted. I used findings from previously conducted studies that utilized massage therapy as a form

of treatment. According to Sturgeon et al. (2009), massage therapy is a treatment that involves applying pressure or manipulating soft tissue and/or muscle by a professional masseur, and can promote relaxation and healing, as well as improving physical functioning.

Recruitment, Participation, and Data Collection

The Walden University IRB approved this study on January 15, 2015 with the approval number 01-15-15-0158568. There was no need to recruit any participants, as findings from previously conducted studies were collected. Data collection included finding studies that met criteria associated with this study. Criteria included breast cancer patients (of all ages and from any location, and diagnosed with any stage of breast cancer). Further included studies that utilized massage therapy (massage therapy as defined in chapters 1 and 2) as its intervention/treatment to treat symptoms of pain and/or distress/anxiety from breast cancer itself or typical medical treatment associated with breast cancer. If additional data or information was needed to conduct the meta-analysis, the former researchers were contacted via contact information (emails as indicated at the conclusion of each study).

These studies have been published and demonstrated results that are reliable according to tests of reliability as indicated in the studies. Further, these studies are recent and therefore, represented the best sources of data pertaining to the topic addressed in this meta-analysis. Table 1 is a table of included pain studies. Table 2 is a table of included distress/anxiety studies (see Tables 1 & 2).

Table 1
A Sample Table Showing Included Pain Studies

Author(s)	N	Type of massage	Effect size/results
Forchuk, C., Baruth, P., Prendergast, M., et al., (2004)	59	Arm massage	Pain control post-massage Day 1- 2.31 Day 2- 2.38 Day 3- 2.68
Listing, M., Reisshauer, A., Krohn, M., Voigt, B. (2009)	86	Classical back & neck Massage	Bodily pain effect size = 0.74 & 0.57 pain of limbs effect size = -0.48 & -0.25
Hernandez-Reif, T., Ironson, G., Beutler, J., Yanexy, V. (2004)	38	30-minute body massage	effect size = -0.96 & -1.35
Sturgeon, M., Wetta-Hall, R., Hart, T., et al. (2009)	51	30-minute Swedish massage	effect size correlation = 0.20
Drackley, N. L., Degnim, A. C., Jakub, J. W., et al. (2012)	46	Neck/Shoulder, hand, or foot massage	Pain mean scores: Pre-massage 3.9 Post-massage 2.5

Note. Studies included were conducted between the years June 2004 and April 2012.

Table 2
A Sample Table Showing Included Distress/Anxiety Studies

Author(s)	N	Type of massage	Effect size/results
Hernandez-Reif, T. et al. (2004)	38	30-minute body massage	Effect size = -1.18 & -0.77
Listing, M., Reisshauer, A., et al. (2009)	86	30-minute classical massage	Effect size = -0.29 & 0.03
Sturgeon, M., Wetta-Hall, R., Hart, T., et al. (2009)	51	30-minute Swedish massage	Effect size = 0.22
Listing, M., Krohn, M., et al. (2009)	34	30-minute Swedish technique massage	Effect size = 0.22, 0.05, & 0.08
Billhult, A., Bergbom, I., Stener-Victorin, E. (2007)	39	20-minute massage (foot/lower leg/hand/lower arm)	Effect size = -0.50
Drackley,	46	Neck/Shoulder, hand, or foot massage	Anxiety mean scores: pre-massage = 2 post-massage = 1.1

Sample Table Showing Included Distress Studies

Note. Studies included were conducted between the years June 2004 and April 2012.

Instrumentation and Organization of Constructs

The following instruments to assess pain were utilized in former studies and were included in this meta-analysis:

Visual Analogue Scale (VAS of pain intensity): This instrument was developed by Portenoy & Tanner in 1996 and is self-administered to assess pain intensity. It is rated from 0-100.

Giessen Complaints Inventory (GBB): This is a five-point Likert scale developed by Brahler and Scheer in 1983, and records physical complaints about different parts of the body such as pain of the limbs.

Short Form McGill Pain Questionnaire (SF-MPQ): This questionnaire was developed by Ron Melzack in 1987 and consists of 11 questions relating to pain perception and four questions with respect to pain level (0 = *none* to 3 = *severe pain*). This short form can be utilized as pre and post assessment (Melzack, 1987).

Short Form-8 Health Survey (SF-8): This short form survey was developed by John E. Ware and assesses eight concepts however, in this study, only the category of bodily pain will be utilized (Ware, Kosinkski, Dewey, & Gandek, 2001).

I used the following instruments to assess distress/anxiety in former studies that were included in this meta-analysis:

State Anxiety Inventory (STAI): a 20 item , 4-point Likert scale; 1 = *not at all*) to 4 - *very much so* that measures an individuals' response to stress (Spielberger, Gorssuch, Lushene, Vagg, & Jacobs, 1983).

Hospital Anxiety and Depression Scale (HAD): This self-assessment scale was

developed by Zigmond and Snaith (1983) and assesses anxiety and depression.

Symptom Distress Scale (SDS): This 10 item, 5-point Likert scale measures symptoms associated with progression of cancer by degrees of discomfort. While there are many symptoms it can measure, this study only utilized the areas that pertain to mood and pain (McCorkle & Young, 1978).

Validity, Reliability, and Populations of Instruments Measuring Pain

Visual Analogue Scale: This assesses pain from least to worst possible pain. Soden, Vincent, and Craske (2004) validated this measurement by comparing it to other pain assessments. It has a reliability of $r = 0.97$ according to Smith et al. (2002).

Giessen Complaints Inventory: this is a scale that assists in the recording of physical complaints about various body parts. This Likert scale has been utilized in many German studies as well as in a study conducted by Listing et al. (2009).

Short Form McGill Pain Questionnaire: assesses pain perception and pain levels and consists of 11 questions on pain perception and four questions on pain level (Likert scale 0-3). According to Melzack (1978), it has been shown to compare with longer, standard pain questionnaires.

The Short Form-8 Health Survey includes many dimensions. In a study conducted by Listing et al. (2009) it was used to measure bodily pain. According to Lefante, Harmon, Ashby, Barnard, and Webber (2004), a test, retest of the short form-8 survey indicated strong reliability.

Validity, Reliability, and Populations of Instruments Measuring Distress/Anxiety

State Anxiety Inventory: Hernandez-Reif et al. (2005) used this measure as a

means to assess anxiety before and after massage therapy. This assessment has adequate

concurrent validity (Spielberger et al., 1970) and internal consistency (Spielberger, 1972).

Reliability ($r = 0.83$) according to Hernandez-Reif et al. (2005).

Hospital Anxiety and Depression Scale: this assesses anxiety and according to

Zigmond and Snaith (1983), is well validated.

Symptom Distress Scale: This assesses symptoms of distress associated with the

progression of cancer by degrees of discomfort associated with pain, mood, and other

symptoms (Sturgeon et al., 2009). According to Rhodes et al. (1987), it has a reliability of

Conbrachs' $x = 0.83$.

Perceived Stress Questionnaire assesses perceived stressful situations and

reactions (Levenstein et al., 1993). It assesses how often an item such as tension occurs.

The PSQ has a Test-retest reliability of 0.82 (Levenstein et al., 1993).

Independent Variable Applied as Treatment

The independent variable that was applied as treatment is massage therapy. This

form of treatment involves applying pressure or kneading soft tissue and/or muscle and

may improve the ability to relax and restore physical functioning (Sturgeon et al. 2009).

In other words, this therapeutic method can be used to facilitate relief with respect to pain

and anxiety/distress and can be administered to either the full body or to specific body

parts (Reaves & McManis, 2010). Moreover, dosages of massage therapy may vary from

short periods to longer durations and is believed to be a simple and noninvasive (Reaves & McManis, 2010).

Within this study, the dosages of massage therapy varied. Further, the location of where the treatment was applied (full body, feet, hands, surgical site) also differed. The implementation of this treatment was used to reduce pain and distress/anxiety in a large and heterogeneous sample of breast cancer patients.

The researchers of former studies that were included in this meta-analysis used various methods of massage therapy to reduce pain and/or distress/anxiety in non-heterogeneous samples of breast cancer patients. These researchers conducted these studies within and outside the United States. Since these former studies conducted on this topic had already occurred and massage therapy as an intervention is currently being utilized as a form of relaxation/stress relief, the chances of future interventions including massage therapy are great.

Operationalization

Each of the studies included within this meta-analysis incorporated a form of massage therapy that is consistent with this studies' operational definition of massage therapy. The same is true with respect to the variables of pain and distress.

Massage therapy- a treatment that involves applying pressure or manipulating soft tissue and/or muscle by a professional masseur, and can promote relaxation and healing, as well as improving physical functioning (Sturgeon, Wetta-Hall, Hart, Good, & Dakhil, 2009, p. 373).

Pain (with respect to breast cancer patients)- is a physiological response that occurs from cancer, the treatment of cancer, or the blend of illness and treatment (Doyle, 2008).

Psychological Distress/Anxiety- any psychological (emotional, cognitive, behavioral), social or spiritual characteristic that could potentially impede upon an individual's ability to adequately cope with cancer, the treatment of cancer, and the physiological symptoms associated with cancer (Roth, Kornblith, Batel-Copel, Peabody, Scher, and Holland, 1998).

Each variable (pain and/or distress/anxiety) had been calculated or measured by the researchers in each former study. Because this is a meta-analysis, the researchers of the studies included may have used different measures to assess pain and distress/anxiety. For instance, with respect to the measurement of pain, Listing et al. (2009) used the Short-form 8 (SF-8) whereas Hernandez-Reif (2005) used the Short-form McGill Pain Questionnaire (SF-MPQ). Due to these differences in obtaining levels of pain, a conversion of scores was necessary in order to compare outcomes.

Data Analysis Plan

With respect to the analyses of data, the Comprehensive Meta-Analysis (CMA) software was used. Data was not screened or cleaned since this data had already been used in former studies.

The following research questions and hypotheses were addressed in this study:

Research Question #1. Based on former studies conducted on message therapy used to diminish pain in breast cancer patients, were significant differences evident when using a larger and heterogeneous sample size of breast cancer patients?

Alternative Hypothesis #1. It was predicted that massage therapy is significantly effective with respect to reducing or eliminating pain in a larger and heterogeneous sample size of breast cancer patients.

Research Question #2. Based on former studies conducted on massage therapy used to diminish distress/anxiety in breast cancer patients, were significant differences evident when using a larger and heterogeneous sample size of breast cancer patients?

Alternative Hypothesis #2. It was predicted that massage therapy is significantly effective with respect to significantly reducing or eliminating distress/anxiety in breast cancer patients when using a larger and heterogeneous sample size of breast cancer patients.

Since this study is a meta-analysis, subjects were not included. The effect sizes of previously conducted studies were compared to examine the levels of pain and distress/anxiety in breast cancer patients (across all durations and frequencies of massage therapy as well as a larger and heterogeneous sample size of breast cancer patients).

External Validity

As with any study, there are always threats to validity. External validity assesses whether or not a causal relationship can be generalized to various settings, individuals, measures, and times (Calder, Phillips, & Tybout, 1982). Because this study is a meta-analysis, a large sample size was used. Using a large sample size improved the ability to

generalize as the sample size included various breast cancer patients from various locations, diverse dosages of treatment, and various stages of breast cancer along with various types of massage therapy.

Internal Validity

With respect to internal validity, the meta-analysis included various studies, which eliminated the potential for a low internal validity. In addition, each of the studies included were coded so that as the studies were combined, they were done so in a homogenous fashion (Quintana & Minami, 2006). Prior to coding, each of the studies were required to meet the inclusion criteria of the study.

Coding of Individual Studies

According to Brown, Upchurch, and Acton (2003), synthesizing research can create problems with regard to the reliability and validity of information obtained from each study. Coding of the included individual studies is imperative and ensures the information is both reliable and relevant (Brown, Upchurch, & Acton, 2003). Creating a code sheet or book grants the ability to collect primary information within each of the studies incorporated into the meta-analysis (Brown, Upchurch, & Acton, 2003). Each of the studies included in this meta-analysis were coded (Study Variable ID). In addition, the included studies were coded for the number of participants, variables assessed, experimental design, assignment of subjects, and calculation of effect size. A list of the variables coded can be found in Appendix A.

Construct or Statistical Conclusion Validity

Statistical conclusion validity may occur if the researcher uses an inaccurate effect size estimation or low statistical power. I controlled for statistical conclusion validity by using an accurate effect size as well as a high statistical power.

Statistical Significance

The purpose of a meta-analysis was to assess the statistical significance of the summary effect after combining the effect sizes of each individual studies (Borenstein et al., 2009). In order to combine effect sizes, the effect sizes must have been provided by the researchers of the former studies included in this meta-analysis. If this was not provided, the findings provided (p-values, standard deviations, mean differences, etc.) were computed into an effect size (Borenstein et al., 2009).

Ethical Procedures

Since this is a meta-analysis, gaining access to or recruiting participants did not apply. If additional information on data was needed, former researchers were contacted. This data was coded and did not include participant information.

I did not use data pertaining to specific participants. Rather, effect sizes, standard deviations, means, p-values, variances were utilized. If additional confidential information was required, the researcher sent all information to the trash when it was no longer needed.

Summary

I compared the effect sizes of formerly conducted studies that assessed the levels of pain and/or distress/anxiety in breast cancer patients that received massage therapy. In

order to gain a clear understanding of the effectiveness of massage therapy on pain and

distress/anxiety in breast cancer patients, a larger and heterogeneous sample were pooled

from former studies. In addition, the study included various frequencies and durations of

massage therapy. I analyzed the data with CMA software. In Chapter 4, I clearly discuss

data collection, and report and review the statistical results of the findings.

Chapter 4: Results

Introduction

The purpose of this study was to explore the effectiveness of massage therapy for decreasing pain and distress/anxiety in a larger, heterogeneous population of breast cancer patients and across all durations and frequencies of treatment.

The following research questions and hypotheses were addressed in this study:

Research Question #1. Based on former studies conducted on message therapy used to diminish pain in breast cancer patients, were significant differences evident when using a larger and heterogeneous sample size of breast cancer patients?

Alternative Hypothesis #1. It was predicted that massage therapy is significantly effective with respect to reducing or eliminating pain in a larger and heterogeneous sample size of breast cancer patients.

Research Question #2. Based on former studies conducted on massage therapy used to diminish distress/anxiety in breast cancer patients, were significant differences evident when using a larger and heterogeneous sample size of breast cancer patients?

Alternative Hypothesis #2. It was predicted that massage therapy is significantly effective with respect to significantly reducing or eliminating distress/anxiety in breast cancer patients when using a larger and heterogeneous sample size of breast cancer patients.

The research questions and hypotheses were tested through performing a meta-analysis. In this chapter, I clearly report the findings of the performed analyses. I clearly describe the data collection process and answer the research questions.

Data Collection

I collected the study data from peer-reviewed journal articles that were identified in Chapter 2, the literature review. The publications of these studies ranged from June 2004 to February 2010. The five studies that I used for meta-analysis analyzed the relationship with massage therapy and pain and/or distress/anxiety. Three studies assessed pain whereas all five studies examined distress/anxiety. Two studies were excluded during the coding stage. The researchers of one study assessed pain control rather than levels of pain (Forchuk et al., 2004) and another failed to provide sufficient statistical findings to compute an effect size despite having emailed the researchers (Drackley et al., 2012). Participants within these five studies were diagnosed with all stages of breast cancer and reside within or outside of the United States.

The researchers of the included studies used a variety of instruments to measure pain and distress/anxiety. The most commonly used scales were the HAD (Hospital Anxiety and Depression Scale), SCL-90R (The Symptom Checklist 90 Revised Depression Subscale), STAI (State Anxiety Inventory), SF-MPQ (Short-form McGill Pain Questionnaire), GBB (Giessen Complaints Inventory), SF-8 (Short Form-8 Health Survey), BSF (Berlin Mood Questionnaire), PSQ (Perceived Stress Questionnaire), SDS (Symptom Distress Scale), and the VAS (Visual Analog Pain Scale).

Statistical Results

The total breast cancer participant pool that I used for this secondary data analysis consisted of 248 individuals. The participants were all female and the mean age of these participants ranged from 51.8 to 59.7 years. Four out of five studies failed to report

race/nationality. The statistical analysis was conducted utilizing CMA software. CMA software is available online and converts means, standard deviations, or mean differences into effect sizes. Individual effect sizes for each study as well as time points within studies were computed.

In addition, I calculated the overall effect sizes for pain and distress/anxiety. Hedge's g was relied on when calculating the effect sizes for this meta-analysis. The information utilized to compute Hedge's g was the standard mean difference however, in studies where the means and standard deviations were not supplied, t-values, p-values, and correlations were used to assist in determining effect sizes (Lipsey & Wilson, 2001).

The Relationship between Massage and Pain

Researchers of three studies that investigated massage therapy and levels of pain were included in these meta-analyses. The characteristics (stage of cancer, median age, etc.) of participants in these three studies are listed in Table 3. The random effect model was selected to calculate weighted means of each effect size. This model was also selected as it operates under the assumption that the true effect is not the same across all studies. Weighted means is necessary because the effect size of a small sample size does not create the same effect as the effect size of a larger sample size (Hedges & Olkin, 1985). Lastly, it is also being assumed that massage therapy is the same across each study and there is no publication bias.

Table 3

A Sample Table Showing Demographics of Participants in Pain Studies

	Stage of cancer	Mean age	Race/nationality
Hernandez et al. (2004)	Stages I-III	53 years	Did not specify
Listing et al. (2009)	50% Stage I	59 years	Did not specify
Sturgeon et al. (2009)	Stage 1 (32.4%)	53 years	84% Caucasian
	Stage II (35%)		6% African Am.
	Stage III (13.5%)		4% Hispanic
	Stage IV (18.9%)		6% Other

It should be noted that in studies that included multiple time points, the CMA software was prompted to give a combined (average) of the time points into one overall effect size. The overall effect size for pain was calculated and is listed in Table 4. The findings indicate that massage therapy did not have a significant effect on pain. Random effect models yielded a pooled effect size (Hedge's g) of -0.149 (95% confidence interval, -0.747-0.448) with respect to pain level measures. The effect estimates of massage on pain from these three studies were highly heterogeneous and not attributable to random error ($Q = 9.61$; $p = .008$).

Table 4

Overall Pain Effect Sizes

Model		*Effect Size and 95% Confidence Interval*					*Test of Null* *	
	N	Point estimate	SE	Variance	Lower limit	Upper limit	Z Value	P Value
Random	3	-0.149	0.305	0.093	-0.747	0.448	-0.489	0.008

The Relationship between Massage and Distress/Anxiety

The researchers of five studies that investigated massage therapy and levels of distress/anxiety were included in these meta-analyses. Anxiety and distress were used interchangeably (same variable) in this study as they were defined similarly in the individual studies included. The characteristics (stage of cancer, median age, etc.) of participants in these five studies are listed in Table 5.

I selected the random effect model to calculate weighted means of each effect size. Weighted means is necessary because the effect size of a small sample size does not create the same effect as the effect size of a larger sample size (Hedges & Olkin, 1985). Again, it is being assumed that massage therapy is the same across each study and there is no publication bias.

The overall effect size for distress/anxiety was calculated and is listed in Table 6. The findings indicate that massage therapy did not have a significant effect on distress/anxiety in breast cancer patients. Random effect models yielded a pooled effect size (Hedge's g) of -0.275 (95% confidence interval, -0.748-0.198) with respect to

distress/anxiety level measures. The effect estimates of massage on distress/anxiety from these five studies were highly heterogeneous and not attributable to random error ($Q = 16.03$; $p = .003$).

Publication Bias

Funnel plots show the distribution of effect sizes (Terrin, Schmid, & Lau, 2005). I utilized funnel plots to identify potential publication bias in included studies. Although there is some debate in the accuracy of these graphs (Terrin, Schmid, & Lau, 2005), these plots are commonly used in meta-analyses to determine whether or not published studies were limited to those with large effect sizes (Sterne & Harbord, 2004). In this study, the funnel plot did not indicate publication bias as the effect sizes were scattered widely across the bottom portion of the funnel rather than located at the top of the funnel. Therefore, publication bias did not influence the conclusions of this study.

Table 5

Demographics of Participants in Distress/Anxiety Studies

	Stage of cancer	Mean age	Race/nationality
Hernandez et al. (2004)	Stages I-III	53 years	Did not specify
Listing et al. (2009)	50% stage I	59 years	Did not specify
Sturgeon et al. (2009)	Stage I (32.4%) Stage II (35%) Stage III (13.5%) Stage IV (18.9)	53 years	84% Caucasian 6% African Am. 4% Hispanic 6% Other
Listing et al.	Stage I (60%)	59.7 years	Did not specify

(2009) Stage II (40%)
Billhult et al. Stage I (12.8)
(2007) Stage II
  (84.6%)
  Stage III
  (0.03%)

Table 6

Overall Distress/Anxiety Effect Sizes

Model		Effect Size and 95% Confidence Interval					Test of Null *	
	N	Point estimate	SE	Variance	Lower limit	Upper limit	Z Value	P Value
Random	5	-0.275	0.241	0.058	-0.748	0.198	-1.140	0.003

Summary

I obtained data for this meta-analysis from the five research studies that reviewed the variables of concern. This meta-analysis was conducted to obtain overall effect sizes for the relationship between massage therapy and pain, and massage therapy and distress/anxiety in breast cancer patients. Overall effect sizes for both pain and distress/anxiety were not significant. Hernandez et al. (2004) did show a significant effect size for pain and distress/anxiety however this one particular effect size did not outweigh the additional non significant study effect sizes.

The acquired results should be viewed with care, as there are limitations to the study. These limitations as well as recommendations for future studies that examine the

effects of massage therapy on pain and distress/anxiety in breast cancer patients will be

discussed in Chapter 5.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this study was to investigate the effectiveness of massage therapy for reducing pain and distress/anxiety in a larger, heterogeneous population of breast cancer patients and across all durations and frequencies of treatment. The nature of this study was to use a quantitative meta-analysis method to examine the effectiveness of massage therapy treatment and its influence on the dependent variables pain and distress/anxiety. The independent variable method of treatment was defined as a therapeutic intervention (massage therapy) used to decrease levels of pain and distress/anxiety.

I used anxiety and distress interchangeably (same variable) in this study as they were defined similarly in the individual studies included. Findings were collected from a number of recently conducted studies that assessed massage therapy and its effectiveness in treating pain and distress/anxiety in breast cancer patients. These studies included various durations and frequencies of massage therapy, as well as breast cancer patients from various locations.

Because this was quantitative study, statistical generalization was desirable. Previous researchers used small samples of breast cancer patients and utilized homogenous breast cancer patients (breast cancer patients recruited from one specific location and receiving a specific form of massage therapy). Therefore, using a number of former studies increased the sample size, which increased the possibility of statistical significance. Using a heterogeneous sample (breast cancer patients from various locations

and receiving various types of massage therapy) allowed for the findings to be generalized to all breast cancer patients. Lastly, this study was conducted to help determine the relative effects of massage therapy on pain and distress/anxiety in breast cancer patients.

Interpretation of Findings

The results of the meta-analysis did not indicate solid confirmation of the relationship between massage therapy and levels of pain in breast cancer patients. In addition, this study also did not find a significant relationship between massage therapy and levels of distress/anxiety in breast cancer patients despite the results of former individual studies (Hernandez et al., 2004). It is possible that Hernandez et al. (2004) found significant results with respect to pain and distress/anxiety within their study as opposed to the additional studies because massage was received three times weekly for five weeks as opposed to weekly or biweekly.

In addition, other studies such as Sturgeon et al. (2009), provided treatment one time weekly for just three weeks and Billhult et al. (2007) provided five treatments in total. It is likely that massage therapy requires additional treatments in order to receive significant improvement with regard to pain and distress/anxiety in breast cancer patients. Overall findings from this meta-analysis did not suggest significance.

The results of many of the studies included in the meta-analysis did indicate that massage therapy may decrease levels of pain or distress/anxiety, however this may be due to additional factors. For instance, Sturgeon et al. (2009) suggests that improvements to pain may be due to the fact that radiation treatment was removed at the same time that

massage therapy was introduced. Therefore, it is unknown if improvements were due to treatment or the removal of radiation.

Kutner et al. (2008) indicated that beneficial effects could either be contributed to the treatment or to the interaction between therapist and patient. This is in line with the theory associated with psychotherapy (Moyer, Rounds & Hannum, 2004). It is possible that the communication between patient and therapist decreased distress/anxiety leading to reporting lower levels of distress/anxiety and pain.

Former researchers have indicated that the theory of physical touch (e.g., Field, 1998) could decrease cortisol levels and improve levels of serotonin. In addition, it may improve immune function and decrease pain, anxiety, and stress levels (Field, 1998). Therefore, it is unknown if massage therapy itself reduces pain and distress/anxiety or if the simple act of touch is all that is needed.

Lastly, Forchuck et al. (2004) used significant others to perform massage therapy treatment rather than licensed massage therapists. While Forchuk et al. (2004) investigated pain control and not the levels of pain in breast cancer patients, it did report significant findings. Therefore, it is possible that massage from significant others is sufficient in controlling levels of pain in breast cancer patients.

Limitations

This study was a meta-analysis. Meta-analyses improve the reliability of outcomes by pooling the findings of several studies, thus increasing the overall sample size. Because of this assumption, it was imperative that the studies included in the meta-analysis were conducted in the same way. In this study, only those studies that met the

inclusion criteria were included. In addition, all of the studies were assessed for reliability and validity. Since this study assessed only breast cancer patients and levels of pain and distress/anxiety, it allowed for the findings to be generalized to only this population. It cannot be generalized to other cancer patients. Further, it included breast cancer patients from all locations (in and outside of the United States), as well as many forms of massage therapy. Therefore, this allowed the findings to be generalized to breast cancer patients in and outside of the United States that received all types of massage therapy (e.g., foot, hand, back, etc.).

Lastly, since inclusion bias was a concern, only studies that strictly met the inclusion criteria (massage therapy as a form of treatment and its influence on pain and distress/anxiety in breast cancer patients) were included. Those studies that were excluded failed to address the same variables such as including other forms of cancer patients, not meeting this studies criteria/definition of massage therapy (i.e., reflexology, relaxation techniques, hypnosis, social support, etc.), failing to assess pain and distress/anxiety as a result of breast cancer or breast cancer treatment, studies conducted prior to 2003, and studies that did not directly assess levels of pain or distress/anxiety (i.e., assessed pain control).

Recommendations

In the current study, I did not find that massage therapy effectively reduces pain and distress/anxiety in larger, heterogeneous population of breast cancer patients and across all durations and frequencies of treatment. However, I did find that massage therapy reduces levels of pain and distress/anxiety to some degree. I recommend that additional

research in this area be done similarly to the Hernandez et al. (2004) study as it found significant results with respect to the treatment of massage therapy on pain and distress in breast cancer patients.

Former studies that were not included (did not meet all inclusion criteria), did not utilize licensed massage therapists to provide the treatment. Instead they evaluated levels of pain in breast cancer patients after receiving massage provided by significant others (Forchuk et al., 2004). Levels of pain control were found to be significant after receiving massage (Forchuk et al., 2004). It is recommended that future studies assesses not only the effectiveness of massage provided by licensed therapists, but by significant others as well.

Lastly, researchers of former studies indicated that massage therapy may be effective in reducing levels of pain and distress/anxiety in breast cancer patients however this may be due to the communication or interaction between therapist and patient and not necessarily massage therapy (Kutner et al., 2008). These positive reactions may be a result of receiving therapy similar to psychotherapy and should therefore be examined closely in future studies.

Implications

Although non significant, the use of massage therapy has shown that it may improve symptoms of pain and distress/anxiety in breast cancer patients. The impact for positive social change would be to decrease the need for additional healthcare needs and reduce the need to ingest pain or distress/anxiety medication. In addition, not needing to take medications for pain and distress/anxiety would also reduce the side effects

associated with these medications. Lastly, the reduction of pain and/or distress/anxiety in breast cancer patients through massage therapy may improve a breast cancer patient's overall quality of life.

Conclusion

It is with no doubt that the diagnosis and/or treatment of breast cancer can cause both psychological and physiological symptoms. While typical medical treatments are aimed at improving the chances of survival, most often the patient is left with unwanted symptoms associated with the illness and the treatment of illness. Contrary to the effects found in this meta-analysis, breast cancer patients and medical care professionals may still wish to consider massage therapy as a complimentary treatment. Massage therapy may be administered by professional massage therapists, by significant others, or family members. This study did not find significant results however it did show that massage therapy may improve symptoms of pain and distress in breast cancer patients.

References

American Cancer Society. (2010). *Breast cancer facts and figures 2010*. Atlanta, GA: Author.

Bishop, S. R., & Warr, D. (2003). Coping, catastrophizing, and chronic pain in breast cancer. *Journal of Behavioral Medicine, 26*(3), 265-281. Database: Medline.

Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. (2009). *Introduction to meta-analysis*. United Kingdom: John Wiley & Sons, Ltd.

Brahler, E. & Scheer, J. W. (1983). Der Giessener Beschwerdefragebogen (GBB). Bern: Huber.

Brem, S., & Kumar, N. B. (2011). Management of treatment-related symptoms in patients with breast cancer: Current strategies and future directions. *Clinical Journal Of Oncology Nursing, 15*(1), 63-71. doi:10.1188/11.CJON.

Brown, S. A., Upchurch, S. L., & Acton, G. J. (2003). A framework for developing a coding scheme for meta-analysis. *Western Journal of Nursing Research, 25*(2), 205-222. Database: CINAHL Plus with Full Text.

Calder, B. J., Phillips, L. W., & Tybout, A. M. (1982). The concept of external validity. *Journal of Consumer Research, 9*(3), 240-244. doi:10.2105/AJPH.2007.126847.

Cassileth, B. R., & Vickers, A. J. (2004). Massage therapy for symptom control: outcome study at a major cancer center. *Journal of Pain & Symptom Management, 28*, 244-249. Database: CINAHL Plus with Full Text.

Chapman, S. (2011). Chronic pain syndromes in cancer survivors. *Nursing Standard, 25*, 21, 35-41. Database: CINAHL Plus with Full Text.

Chida, Y., & Steptoe, A. (2009). Cortisol awakening response and psychosocial factors: a
systematic review and meta-analysis. *Journal of Biology and Psychology, 80*,
265-278. Database: MEDLINE with Full Text.

Craig, A. D. (2003). Pain Mechanisms: Labeled Lines Versus Convergence in Central
Processing. *Annual Review of Neuroscience, 26* (1), 1–30. Database: MEDLINE
with Full Text.

Dausch, B. M., Compas, B. E., Beckjord, E., Luecken, L., Anderson-Hanley, C.,
Sherman, M., & Grossman, C. (2004). Rates and correlates of DSM-IV diagnoses
in women newly diagnosed with breast cancer. *Journal of Clinical Psychological
Medical Settings, 11*(3), 159-169. doi:10.1023/B:JOCS.0000037610.60644.d6.

Deltour, I., Kehlet, H., & Kroman, N. (2012). Psychological distress among women with
newly diagnosed breast cancer. *European Journal of Oncology Nursing, 16*, 439-
443. doi:10.1016/j.ejon.2011.10.001.

Dhabhar, F. (2009). Enhancing versus suppressive effects of stress on immune function:
implications for immunoprotection and immunopathology.
Neuroimmunomodulation, 16(5), 300-317. Database: MEDLINE with Full Text.

Doyle, N. (2008). Cancer survivorship: evolutionary concept analysis. *Journal of
Advanced Nursing, 62*(4), 499-509. Database: CINAHL Plus with Full Text.

Drackley, N. L., Degnim, A. C., Jakub, J. W., Cutshall, S. M., Thomley, B. S., Brodt, J.
… Boughey, J. C. (2012). Effect of massage therapy for postsurgical mastectomy
recipients. *Clinical Journal of Oncology Nursing, 16*(2), 121-124. Database:
CINAHL Plus with Full Text.

Ewertz, M., & Jensen, A. (2011). Late effects of breast cancer treatment and potentials

   for rehabilitation. *Acta Oncologica, 50*(2), 187-193. Database: MEDLINE with

   Full Text.

Faller, H., Schuler, M., Richard, M., Heckl, U., Weis, J., & Küffner, R. (2013). Effects of

   psycho-oncologic interventions on emotional distress and quality of life in adult

   patients with cancer: systematic review and meta-analysis. *Journal Of Clinical

   Oncology, 31*(6), 782-793. Database: CINAHL Plus with Full Text.

Ferrell, B. R., Dow, K. H., Leigh, S., Ly, J., & Gulasekaram, P. (1995). Quality of life in

   long-term cancer survivors. *Oncology Nursing Forum, 22*(6), 915-922. Database:

   CINAHL Plus with Full Text.

Field, T. M. (1998). Massage therapy effects. Am Psychol, 53, 1270-1281. Database:

   MEDLINE with Full Text.

Forchuk, C., Baruth, P., Prendergast, M., Holliday, R., Bareham, R., Brimner, S., & ...

   Yammine, N. (2004). Postoperative arm massage: a support for women with

   lymph node dissection. Previously published in Cancer Nursing, Volume 27,

   Issue No. 1, pp. 25-33 (2004). Database: CINAHL Plus with Full Text.

Ganz, P. (2008). Psychological and social aspects of breast cancer. *Oncology*, *22*(6), 642-

   646. Database: MEDLINE with Full Text.

Gielissen, M., Verhagen, S., Witjes, F., & Bleijenberg, G. (2006). Effects of cognitive

   behavior therapy in severely fatigued disease-free cancer patients compared with

   patients waiting for cognitive behavior therapy: a randomized controlled trial.

   Journal Of Clinical Oncology, *24*(30), 4882-4887. Database: CINAHL Plus with

Full Text.

Goudas, L. C., Bloch, R., Gialeli-Goudas, M., Lau, J. & Carr D. B. (2005). The epidemiology of cancer pain. *Cancer Invest, 23*, 182-190. Database: MEDLINE with Full Text.

Greisinger, A., Lorimor, R., Aday, L., Winn, R., & Baile, W. (1997). Terminally ill cancer patients: their most important concerns. *Cancer Practice, 5*(3), 147-154. Database: CINAHL Plus with Full Text.

Gutenbrunner, C., & Glaeser, J-J. (2007). Rehabilitation, Physikalische Medizin und Naturheilverfahren. Springer Verlag: Heidelberg.

Harrington, J., Baker, B., & Hoffman, C. (2012). Effect of an integrated support programme on the concerns and wellbeing of women with breast cancer: A national service evaluation. Complementary Therapies In Clinical Practice, 18(1), 10-15. Database: CINAHL Plus with Full Text.

Hartl, K., Janni, W., Kastner, R., Sommer, H., Strobl, B., Rack, B., Stauber, M. (2003). Impact of medical and demographic factors on long-term quality of life and body image of breast cancer patients. Ann Oncology, 14, 1064. Database: MEDLINE with Full Text.

Hedges, L. V., & Olkin, I. (1985). Statistical methods for meta-analysis. New York, NY: Academic Press.

Hensel, M., Zoz, M., & Ho, A. D. (2009, January). Complementary and alternative medicine in patients with chronic lymphocytic leukemia. Supportive Care in Counseling, 17(1), 47-52. Database: CINAHL Plus with Full Text.

Hernandez-Reif, M. Ironson, G., Field, T., Hurley, J., Katz, G., Diego, M.,...

Burman, I. (2004). Breast cancer patients have improved immune and neuroendocrine

    functions following massage therapy. Journal of Psychosomatic Res., 57, 45-52.

    Database: MEDLINE with Full Text.

Hernandez-Reif, M., Field, T., Ironson, G., Beutler, J., Vera, Y., Hurley, J.,...Fraser., M.

    (2005). Natural killer cells and lymphocytes increase in women with breast cancer

    following massage therapy. International Journal of Neuroscience, 115, 495-510.

    Database: MEDLINE with Full Text.

Holmes, J. A., & Stevenson, C., A., Z. (1990). Differential effects of avoidant and

    attentional coping strategies on adaptation to chronic and recent-onset pain.

    Health Psychology, 9, 577-584. Database: MEDLINE with Full Text.

Hyland, M. E. (2005). A tale of two therapies: psychotherapy and complementary and

    alternative medicine (CAM) and the human effect. *Journal of Clinical Medicine,*

    5, 361-367. Database: MEDLINE with Full Text.

Irvin, W. Jr., Muss, H. B., & Mayer, D. K. (2011). Symptom Management in Metastatic

    Breast Cancer. Oncologist, 16(9), 1203-1214. Database: MEDLINE with Full

    Text.

Janz, N., Mujahid, M., Chung, L., Lantz, P., Hawley, S., Morrow, M., & ... Katz, S.

    (2007). Symptom experience and quality of life of women following breast cancer

    treatment. Journal Of Women's Health (15409996), 16(9), 1348-1361. Database:

    CINAHL Plus with Full Text.

Joske, D. J. L., Rao, A., KHstjanson, L.(2006). Critical review of complementary

therapies in hemato-oncology. Internal Medicine Journal. 3b, 9, 579-586.

Database: MEDLINE.

Khatcheressian, J. K., Wolff, A. C., Smith, T. J., Grunfeld, E., Muss, H. B., Vogel, V. G., et al. (2006). American Society of Clinical Oncology: 2006 update of the breast cancer follow-up and management guideline in the adjuvant setting. Journal of Clinical Oncology, 24, 5091-7.

Kornblith, A. B., Powell, M., Regan, M. M., Bennett, S., Krasner, C., Moy, B.,...Winer, E. (2007). Long-term psychosocial adjustment of older versus younger survivors of breast and endometrial cancer. Psychooncology 16, 895-903. Database: CINAHL Plus with Full Text.

Kremer, E., Atkinson, J. H., & Ingelzi, R. J. (1981). Measurement of pain: patient preference does not confound pain measurement. Pain, 10, 241-248. Database: MEDLINE with Full Text.

Kumar, S. P. (2011). Utilization of Brief Pain Inventory as an Assessment Tool for Pain in Patients with Cancer: A Focused Review, 17, 108-115.

Lazarus, A., & Folkman, S. (1984). Stress, Appraisal, and Coping, Springer, New York.

Lee, T. S., Kilbreath, S. L., Refshauge, K. M., Herbert, R. D., & Beith, J. M. (2008). Prognosis of the upper limb following surgery and radiation for breast cancer. Breast Cancer Res. Treatment, 110, 19-37.

Lefante, J. L. J., Harmon, N. H., Ashby, K. M., Barnard, D., & Webber, L. S. (2004). Use of the SF-8 to assess health-related quality of life for a chronically ill, low-income population participating in the Central Louisiana Medication Access Program

(CMAP). Tulane University School of Medicine, New Orleans.

Levenstein, S., Prantera, C., Varvo, V., Scribano, M. L., Berto, E., Luzi, C., & Andreoli, A. (1993). Development of the perceived stress questionnaire: a new tool for psychosomatic research. *Journal of Psychosomatic Research, 37,* 19-32. Database: MEDLINE with Full Text.

Lipsey, M. W., & Wilson, D. B. (2001). Practical meta-analysis (Applied Social Research Methods Series, Vol. 49). Thousand Oaks, CA: SAGE.

Listing, M., Krohn, M., Liezmann, C., Kim, I., Reisshauer, A., Peters, E., Burghard, F. K., & Rauchfuss, M. (2009). The efficacy of classical massage on stress perception and cortisol following primary treatment of breast cancer. *Archives Of Women's Mental Health, 13*(2), 165-173. doi:10.1007/s00737-009-0143-9.

Listing, M., Reisshauer, A., Krohn, M., Voigt, B., Tjahono, G., Becker, J., & ... Rauchfuss, M. (2009). Massage therapy reduces physical discomfort and improves mood disturbances in women with breast cancer. *Psycho-Oncology, 18*(12), 1290-1299. Database: MEDLINE with Full Text.

MacIntyre, P. E., & Schug, S. A. (2007). Acute Pain Management: A practical guide, Third Edition. Saunders Elsevier, Edinburgh.

Macmillian Cancer Support. (2008). Two Million Reasons. The Cancer Survivorship Agenda: Why we need to support people living with or beyond cancer. Macmillan Cancer Support, London.

McCorkle, R. U. T. H., & Young, K. (1978). Development of a symptom distress scale. *Cancer nursing, 1*(5), 373-378. Database: CINAHL Plus with Full Text.

McNair, D. M., Lorr, M., & Droppeman, L. F. (1992). Profile of Mood States, San Diego, California: Education and Industrial Testing Service.

Mehling, W., Jacobs, B., Acree, M., Wilson, L., Bostrom, A., West, J., & ... Hecht, F. (2007). Symptom management with massage and acupuncture in postoperative cancer patients: a randomized controlled trial. *Journal Of Pain & Symptom Management*, *33*(3), 258-266. Database: CINAHL Plus with Full Text.

Melzack, R. (1987). The short-form McGill Pain Questionnaire. Pain, 30, 191-197.Mertz, B. G., Bistrup, P. E., Johansen, C., Dalton, S. O., Meyer, T. J., & Mark, M. M. (1995). Effects of psychosocial interventions with adult cancer patients: A meta-analysis of randomized experiments. *Health Psychology, 14*(2), 101-108. Database: MEDLINE with Full Text.

Melzack, R. (1993). Pain: past, present, and future. *Canadian Journal of Experimental Psychology, 47*(4), 615-629. Database: MEDLINE with Full Text.

Melzack, R. & Wall, P. D. (1962). Brain, 85, 331.

Mertz, B. G., Bistrup, P. E., Johansen, C., Dalton, S. O, Deltour, I., Kehlet, H., & et al. (2012). Psychological distress among women with newly diagnosed breast cancer. *European Journal of Oncology Nursing, 16*(4), 439-443.

Meyer, T. J., & Mark, M. M. (1995). Effects of psychosocial interventions with adult cancer patients: a meta-analysis of randomized experiments. *Health Psychology: Official Journal Of The Division Of Health Psychology, American Psychological Association*, *14*(2), 101-108.

Modi, N., & Glover, J. (1995, April). Massage therapy for preterm infants. Paper

presented at Touch Research Symposium, Providence, Rhode Island.

Moyer, C. A., Rounds, J., Hannum, J. W. (2004). *A meta-analysis of massage therapy research. Psychological Bulletin, 130*, 3-18. Database: PsycARTICLES.

National Certification Board of Therapeutic Massage and Bodywork. (2007, October 30) Glossary: Therapy & Techniques. Online document at: www.ncbtmb.org/consumers_glossary.php.

National Comprehensive Cancer Network Distress Management Panel. (2005). Clinical practice guidelines in oncology: Distress management, v. 1.

Northouse, L. L., Templin, T., Mood, D. (2001). Couples' adjustment to breast disease during the first year following diagnosis. *Journal of Behavioral Medicine, 24*, 115.

Phillips, J. L. & Currow, D. C. (2010). Cancer as a chronic disease, Collegian, 17, 2, 47-50.

Portenoy, R. K. & Lesage, P. (1999). Management of cancer pain. Lancet, 353, 1695-1700.Raphael, J., Ahmedzai, S., Hester, J., Urch, C., Barrie, J., Williams, J., & ... Sparkes, E. (2010). Cancer pain: part 1: Pathophysiology; oncological, pharmacological, and psychological treatments: a perspective from the British Pain Society endorsed by the UK Association of Palliative Medicine and the Royal College of General Practitioners. Pain Medicine (Malden, Mass.), 11(5), 742-764.

Portenoy, R. K. & Tanner, R. M. (1996).Visual Analog Scale and Verbal Pain Intensity Scale: From Pain Management: Theory and Practice, edited by RK Portenoy &

RM Tanner, copyright 1996 by Oxford University Press, Inc. Used by permission of Oxford University Press.

Post-White, J, Kinney, M. E., Savik, K., Gau, J. B., Wilcox, C., & Lerner, I. (2003). Therapeutic massage and healing touch improve symptoms in cancer. Integrated Cancer Therapy, 2, 332-344. Database: MEDLINE.

Pruthi, S., Degnim, A. C., Bauer, B. A., DePompolo, R. W. & Nayar, V. (2009, August). Value of massage therapy for patients in a breast clinic. *Clinical Journal of Oncology Nursing, 13*(4), 422-425. Database: MEDLINE.

Raphael, J., Ahmedzai, S., Hester, J., Urch, C., Barrie, J., Williams, J., & ... Sparkes, E. (2010). Cancer pain: part 1: pathophysiology; oncological, pharmacological, and psychological treatments: a perspective from the British Pain Society endorsed by the UK Association of Palliative Medicine and the Royal College of General Practitioners. Pain Medicine, 11(5), 742-764.

Reaves, G., & McManis, T. (2010). Massage therapy as integrative treatment in cancer patients. *Kansas Nurse, 85*(3), 9-12. Database: EBSCO.

Rhodes, V. A., Watson, P., Johnson, M., Madsen, R., & Beck, N. (1987). Patterns of nausea, vomiting, and distress in patients receiving antineoplastic drug protocols. *Oncology Nursing Forum, 14*, 35-43. Database: MEDLINE.

Rietman, J. S., Dijkstra, P. U., Debreczeni, R., Geertzen, J. B., Robinson, D. H., & De Vries, J. (2004). Impairments, disabilities and health related quality of life after treatment for breast cancer: a follow-up study 2.7 years after surgery. Disability And Rehabilitation: *An International, Multidisciplinary Journal, 26*(2), 78-84.

Roth, A. J., Kornblith, A. B., Batel-Copel, L., Peabody, E., Scher, H. I., Holland, J. C., (1998). Rapid screening for psychologic distress in men with prostate carcinoma: a pilot study. *Cancer 82*, 1904-1908. Database: MEDLINE.

Rustoen, T., & Begnum, S. (2000). Quality of life in women with breast cancer: A review of the literature and implications for nursing practice. *Cancer Nursing, 23*, 416. Database: MEDLINE.

Ryan, H., Schofield, P., Cockburn, J., Butow, P., Tattersall, M., Turner, J., & ... Bowman, D. (2005). How to recognize and manage psychological distress in cancer patients. *European Journal Of Cancer Care, 14*(1), 7-15. Database: MEDLINE.

Sagar, S. M., Dryden, T., Wong, R. K. (2007). Massage therapy for cancer patients: a reciprocal relationship between body and mind. *Curr Oncology, 14*, 45-56. Database: MEDLINE with Full Text.

Smith, M. C., Kemp, J., Hemphill, L., Vojir, C. P. (2002). Outcomes of therapeutic massage for hospitalized cancer patients. *Journal of Nursing Scholarship, 34*, 257-262. Database: CINAHL Plus with Full Text.

Soden K., Vincent K., Craske S., Lucas C., Ashley S. (2004). A randomized controlled trial of aromatherapy massage in a hospice setting. *Palliative medicine*, 18, 87–92. Database: MEDLINE with Full Text.

Spielberger, C. D., Gorssuch, R. L., Lushene, P. R., Vagg, P. R., & Jacobs, G.A (1983). Manual for the State-Trait Anxiety Inventory. Consulting Psychologists Press, Inc.

Sterne, J. A. C. & Harbord, R., M. (2004). Funnel plots in meta-analysis. *The Stata*

Journal, 4(2), 127-141. Database: MEDLINE with Full Text.

Stone, P. C., Minton, O. (2008). Cancer-related fatigue. *European Journal of Cancer 44,*
1097-1104. Database: CINAHL Plus with Full Text.

Sturgeon, M., Wetta-Hall, R., Hart, T., Good, M., & Dakhil, S. (2009). Effects of
therapeutic massage on the quality of life among patients with breast cancer
during treatment. *Journal Of Alternative & Complementary Medicine, 15*(4), 373-
380. Database: CINAHL Plus with Full Text.

So, W., Marsh, G., Ling, W., Leung, F., Lo, J., Yeung, M., & Li, G. (2009). The
symptom cluster of fatigue, pain, anxiety, and depression and the effect on the
quality of life of women receiving treatment for breast cancer: a multicenter
study. *Oncology Nursing Forum, 36*(4), E205-14. Database: CINAHL Plus with
Full Text.

Treede, R. D., Jensen, T. S., Campbell, J. N., et al. (2008). Neuropathic pain:
Redefinition and grading system for clinical and research purposes. Neurology,
70, 1630-1635.University of Texas MD Anderson Cancer Center (2008).
Retrieved August 20, 2012 from http://www.mdanderson.org.

University of Texas MD Anderson Cancer Center. (2008). Retrieved June 10, 2014 from
http://www.mdanderson.org/education-and-research/index.html.

Ware, J. E., Kosinkski, M., Dewey, J. E., & Gandek, B. (2001). How to score and
interpret single-item health status measures: A manual for users of the SF-8
Health Survey. Lincoln (RI): Quality Metric Inc.

Warren, M. (2010). Uncertainty, lack of control and emotional functioning in women

with metastic breast cancer: A review and secondary analysis of the literature

using the critical appraisal technique. *European Journal of Cancer Care, 19*, 564-

574. Database: MEDLINE.

Zabora, J., BrintzenhofeSzoc, K., Curbow, B., Hooker, C., & Piantadosi, S. (2001). The

prevalence of psychological distress by cancer site. *PsychoOncology, 10*, 19-28.

Database: MEDLINE with Full Text.

Zigmond, A. S. & Snaith, R. (1983). The Hospital Anxiety and Depression scale. *Acta

Psychiatrica Scandinavica 67*(6): 361–370. Database: MEDLINE with Full Text.

Appendix A: Coding of Variables

STUDY VARIABLE CODES

The following codes are utilized to assist in the ability to ascertain the reliability and to

synthesize the information gathered from the studies included.

Study ID number (SVC-1)

Studies included based upon the hypotheses used being consistent with the hypotheses

studied in this meta-analysis.

Categories: A: Hypothesis 1

      B: Hypothesis 2

      C: Combination of Hypothesis 1& 2

Number of participants (SVC-2)

Type of research design (SVC-3)

Categories: A: clinical trial

      B: pilot study

Results indicated in each study (i.e., mean, p-value, etc.) (SVC-4)

Categories:

      1. p-value

      2. mean

      3. effect size

Curriculum Vitae

TANYA BRIGITTE BUCHRIESER
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Professional Summary
Health Psychology PhD candidate (all but dissertation) with excellent research, time management and problem
solving skills. Ability to function at a high level in a wide variety of settings. Hard-working, entry-level health
psychologist (ABD), looking to apply my education and experience to a job in health related research.

Skill Highlights
Excellent quantitative skills
Professional demeanor
Detail oriented
Strong knowledge of areas of Oncology
Microsoft Word, Excel, PowerPoint
Critical thinker
Planning/coordinating

Accomplishments
Member of Walden University Psi Chi Honor Society; 2010 - Present
Successfully completing a meta-analysis dissertation which is projected to be completed in 2015
Participated in research study with psychology department of Cortland College and Cornell University during undergraduate studies (1996-1997)

Professional Experience
Research Coordinator
July 2015 to Current
SAINT FRANCIS HOSPITAL - Roslyn, NY
Provide support to the staff of the research department, including study start up and initiation, patient coordination relate to participation and follow up.

Special Educator
September 2007 to July 2015
NEW YORK THERAPY PLACEMENT SERVICES - Port Jefferson Station, NY
Assist learning disabled students in all subject areas in order to meet each student's IEP goals.

Prepare progress notes on the day of visits and write annual progress reports and IEPs.

Special Educator/Autistic Therapist
September 2004 to July 2015
LONG ISLAND DEVELOPMENTAL CONSULTANTS - Stony Brook, NY
Provide special education services to school aged special needs students in their homes and elementary schools as approved by their local school district. Prepare progress notes on the day of visits, carry out IEP goals and write annual progress reports and IEPs.

Special Educator/Evaluator/Ongoing Service Coordinator
July 2003 to July 2015
KIDZ THERAPY SERVICES - Hauppauge, NY
Direct, supervise, evaluate and provide special education services to preschool and early intervention aged special needs students in their homes and/or school as approved by their local school district and/or Suffolk county. Prepare progress notes on the day of visits, carry out IFSP/IEP goals and write annual progress reports and IEPs. Attend CPSE and EI meetings, conduct evaluations, carry out Ongoing Service Coordinator duties.

Education and Training
Ph.D. : **Health Psychology**, 2015
Walden University - Minneapolis, MN
4.0 GPA
Master of Science : **Special Education**
(N-12)/Elementary Education (N-6), August 2003
Dowling College - Minneapolis, New York
3.75 GPA
Bachelor of Arts : Psychology, 1998
State University College at Cortland - Oakdale, NY