Spring 2019

Psychological Distress, Pain, Physical Impairment, and Acceptance among Women with Ovarian Cancer

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Recommended Citation

Millmann, Megan M., "Psychological Distress, Pain, Physical Impairment, and Acceptance among Women with Ovarian Cancer" (2019). *MSU Graduate Theses*. 3338.
https://bearworks.missouristate.edu/theses/3338

PSYCHOLOGICAL DISTRESS, PAIN, PHYSICAL IMPAIRMENT, AND ACCEPTANCE AMONG WOMEN WITH OVARIAN CANCER

A Masters Thesis
Presented to
The Graduate College of
Missouri State University

In Partial Fulfillment
Of the Requirements for the Degree
Master of Science, Clinical Psychology

By
Megan Millmann
May 2019

PSYCHOLOGICAL DISTRESS, PAIN, PHYSICAL IMPAIRMENT, AND ACCEPTANCE AMONG WOMEN WITH OVARIAN CANCER

Psychology

Missouri State University, December 2018

Master of Science

Megan M. Millmann

ABSTRACT

Despite ovarian cancer being the deadliest form of gynecological cancers, there are significantly fewer studies addressing this type of cancer. The psychological and physical impact of the diagnosis and treatment for ovarian cancer can be debilitating. While previous studies have examined variables like physical impairment, pain, willingness and acceptance, and psychological distress in cancer patients, none have addressed all of these in ovarian cancer. Thus, the present study examined the relationship of these variables in 11 women with ovarian cancer, via self-report measures. To evaluate whether willingness and acceptance mediated the relationship between pain, physical impairment, and psychological distress, a linear multiple regression was utilized. While the mediation model was not supported, results indicate a potential trend in the relationship among physical impairment, acceptance, and psychological distress when willingness and acceptance are held constant. This suggests that a strong association between identified variables among women with ovarian cancer may be found through expansion of data and future research.

KEYWORDS: ovarian cancer, pain, acceptance and commitment therapy, willingness and acceptance, psychological distress, physical impairment

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ACKNOWLEDGEMENTS

I would like to acknowledge my appreciation for the following individuals who made completion of my graduate studies possible:

My parents, Connie and Cal Millmann, my best friend, Grant Orinstien, and the rest of my family and friends who listened to and supported me throughout this journey. Your love and shoulders to cry on have ameliorated this stressful process.

My thesis committee for their help and support throughout this long process. I am forever grateful for the patience and assistance throughout the course of my schooling at Missouri State University.

The participants who took the time to complete the questionnaires for this study, despite their debilitating conditions. I am beyond appreciative of your help and am in awe at the courage you have in fighting the fight against cancer.

I dedicate this thesis to my aunt Becky who graciously lost her battle with ovarian cancer. It is my hope that this study will one day help individuals who are still facing the battle.

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INTRODUCTION

Despite more diagnoses of gynecological cancers in a given year when compared to breast cancer, research for the latter exceeds the number of studies for the former (Collins, Holcomb, Chapman-Davis, Khabele, & Farley, 2014). While not disregarding the promising advancements made in the breast cancer research, it is clear gynecological cancers are also in need of attention. Ovarian, cervical, uterine, vaginal, vulvar, and an additional subtype, fallopian tube, make-up the group of gynecological cancers (Centers for Disease Control and Prevention [CDC], 2018). For the purpose of this paper, we will be focusing on women diagnosed with ovarian cancer. According to the American Cancer Society (2017), ovarian cancer is the deadliest cancer of the female reproductive system, with only 45% of women surviving longer than five years after their diagnosis. In 2017, approximately 22,440 women were newly diagnosed with ovarian cancer and 14,080 women died because of the disease (Ovarian Cancer Research Fund Alliance [OCRFA], 2016). Although treatment is substantially more effective if the cancer is detected during its earlier stages, the disease often goes undetected until it has advanced, and/or metastasized. This is partially due to initial symptoms being non-specific, like fatigue, back pain, menstrual irregularities, bloating, and digestive alterations (Goff, Mandel, Melancon, & Muntz, 2004; Stavraka et al., 2012). Additionally, the two common methods (e.g. transvaginal ultrasound and CA-125 blood test) utilized for detection of ovarian cancer during its earlier stages need improvement and are not usually recommended by medical professionals for routine use (American Cancer Society, 2017).

Unfortunately, there are presently no known ways to prevent the occurrence of ovarian cancer. Once the cancer is diagnosed, patients endure aggressive treatment, with the standard approach being a combination of debulking surgeries and chemotherapy (American Cancer Society, 2017). Specifically, surgical therapy involves an exploratory laparotomy, a total abdominal hysterectomy, debulking of the tumor, and additional pelvic and lymph node biopsies (Hennessy, Coleman, & Marman, 2009). Surgery is followed by ongoing rounds of chemotherapy, most often a combination of cisplatin or carboplatin and paclitazel or docetaxel (American Cancer Society, 2017). However, even with treatment, approximately 70% of women diagnosed with ovarian cancer will have a recurrence of the disease (Centers for Disease Control and Prevention [CDC], 2017). Sadly, the prolonged toxic treatments and invasive surgeries contribute to an assortment of side effects that have an adverse impact on quality of life, such as suppressed immune system, fatigue, nausea, pain, physical impairment, infertility, and psychological distress (OCRFA, 2016; Stavraka et al., 2012; DellaRipa et al., 2015).

Many of these side effects and symptoms associated with ovarian cancer are almost inevitable, altering the way one lives their life. Thus, not only do these women have to cope with the traumatic idea of having a life-threatening illness, they have to endure debilitating manifestations and changes to their body. With the awareness of the frequency in relapse, undesired physical and mental features, and severity of ovarian cancer, the following paper focuses on the relationship between prominent variables that influence the way one copes with a life-threatening illness.

Pain

Coping with pain is one of the most commonly reported challenges by patients diagnosed with ovarian cancer (American Cancer Society, 2017). In fact, pain has been placed as one of the top five most experienced symptoms among women diagnosed with the disease (Donovan, Hartenbach, & Method, 2005) and a high prevalence report it as unmanaged (Rolnick et al., 2007; Price et al., 2013). Several areas of pain are usually described by patients with ovarian cancer. For example, in Goff et al.'s (2004) study half of the participants reported abdominal pain, 41% pelvic pain, and 34% back pain. After comparing pain severity among individuals with different types of cancer, Cleeland (1984) found 31% of women with ovarian cancer reported their pain at a 5 or greater on a 0 to 10 scale compared to 21% for colon cancer and 20% for uterine cancer. The intensity of their pain created interference with daily activities and enjoyment of life. In attempting to further understand the impact of pain, Portenoy and colleagues (1994) found 42% of women reported constant, moderate-to-severe pain. They further demonstrated pain as a predictor for psychological distress and physical impairment, with the women reporting moderate pain-related interference in activity, work, mood, and overall satisfaction with life.

Physical Impairment

In addition to coping with pain, women with ovarian cancer are also likely to be forced to cope with changes in their level of activity due to physical impairments developed by the cancer and/or treatment. Physical impairment is defined by the World Health Organization (2018) as a problem in body function, where a person is limited in their physical capacity to move, coordinate actions, or perform physical activities. An analysis evaluating functional limitations in long-term survivors of eleven different types of cancer, revealed women with ovarian cancer are three times more likely to experience physical impairment than individuals diagnosed with bladder, prostate, melanoma, and colorectal cancer (Schootman, Aft, & Jeffe, 2009). Women with ovarian cancer experience various types of physical impairment as demonstrated in the

Lutgendorf et al. (2013) study showing survivors of advanced ovarian cancer experience limitations in walking, spending time out of bed, exercising, independent mobility, and sexual activities. The women reported various physical symptoms associated with the impairment such as fatigue, abdominal swelling, neuropathy, and incision hernias. In a qualitative study by Howell, Fitch, and Deane (2003), most of the women were either unemployed or placed on long-term disability and reported challenges with daily living activities like cleaning, exercise, taking out the trash, and doing the dishes. The women mentioned loss of energy and repercussions of treatment on their bodies as reasons for the changes in activity and ability to stay employed.

Not surprising, pain and physical impairment often occur together (Arnstein, Caudill, Mandle, Norris, & Beasley, 1999). One study revealed a significant correlation between both self-report and performance-based measures and pain. Specifically, the authors found an inverse relationship with pain intensity and physical performance, meaning higher pain ratings were associated with lower performance and greater disability (Pulles, & Oosterman, 2011). In a study completed by Kornblith et al. (1995), 42% of women with ovarian cancer indicated persistent pain for two weeks. Among these women, the Functional Living Index- Cancer (FLIC) revealed moderate-to-severe pain related interference with general activities, walking, and work. According to a survey mailed out by the National Ovarian Cancer Coalition (NOCC), 60% of responding women who have been diagnosed with ovarian cancer at some point, self-reported a walking disability. One third of the women reported their physical impairment as severe, with pain being a significant independent predictor of physical impairment severity (Campbell, Hagan, Gilbertson-White, Houze, & Donovan, 2016).

Psychological Distress in Cancer

As can be expected, the elongated process of coping with the diagnosis, treatment, and side effects, places an exceptional amount of stress on patients and their caregivers. As a result, many become distressed (Hipkins, Tarrier, & Jayson, 2004). Psychological distress is most commonly characterized as unpleasant emotions embedded in the context of strain and stress that affects an individual's level of functioning (Ridner, 2004). An overall prevalence rate of psychological distress was 35% among a sample of patients diagnosed with several types of cancers. More specifically, those diagnosed with gynecological cancers (of which ovarian represented 47%) reported an overall distress rate of 29% (Zabora, Brintzenhofeszoc, Curbow, Hooker, & Piantadosi, 2001). Similarly, another study examining individuals diagnosed with various forms of cancer found 62.4% of the sample reported moderate distress while 30% reported severe. Of that sample, individuals with gynecological cancers were among the top highest scores (Karunanithi, Sagar, Joy, & Vedasoundaram, 2018). More so, a longitudinal study examining individuals with ovarian cancer revealed women experience occasional cases of clinically significant anxiety and/or depression throughout the course of diagnosis, treatment, and recovery (Goncalves, Jayson, & Tarrier, 2008). This is supported by Norton et al.'s (2004) findings where one-fifth of women diagnosed with ovarian cancer reported moderate to severe levels of distress and over 50% reported high stress levels because of their cancer and treatment.

In a qualitative analysis of conversations via letters, cards, and emails between survivors of ovarian cancer, physical side effects from treatment were described as significantly detrimental to overall psychological wellbeing. Specifically, the women mentioned fatigue, nausea, and pain (Ferrell, Smith, Cullinane, & Melancon, 2003). One third of the women in Kornblith et al.'s (1995) study reported significantly high levels of psychological distress, with physical impairment being the strongest predictor. Psychological distress was also greater in a sample of women with ovarian cancer who revealed the inability to be physical sexually because of vaginal dryness and pain during intercourse (Stavraka et al., 2012). Compared to the general population in which 15% of women warrant a clinical evaluation of a score greater than 16 on the Center for Epidemiological Studies-Depression scale (CES-D), Bodurka-Bevers et al. (2000) found a higher prevalence rate of 21% for their sample of women with ovarian cancer. Additionally, the women with poorer performance status (>2 days of bed rest during awake hours) were two times more likely than the general population to elevate the CES-D. Following the public health guidelines for weekly physical activity, only 31.1% of women with ovarian cancer were meeting them, with 53.5% completely sedentary and 15.3% insufficiently active (Stevinson et al. 2007). Women meeting the guidelines had significantly higher scores on the Functional Assessment of Cancer Therapy- Ovarian (FACT-O) compared to those who were identified as insufficiently active or sedentary, indicating greater quality of life for women who are physically active.

When examining the relationship between pain, physical impairment, and psychological distress, past researchers have suggested individuals tend to have improved psychological outcomes if they have perceived control, or believe they can influence their outcomes (Bárez, Blasco, Fernández-Castro, & Viladrich, 2009; Ranchor et al, 2010). More specifically, Norton et al. (2005) proposed a model that revealed perceived control is a mediator for the direct relationship between physical impairment and psychological distress in women with ovarian cancer. In other words, when women believe they have control over the situation, their response to physical impairment and psychological distress are improved. However, an alternative to perceived control that may be more effective in understanding and developing potential treatment interventions may be acceptance and willingness.

Acceptance and Willingness

From an Acceptance and Commitment Therapy (ACT) perspective, acceptance is the willingness to experience aversive stimuli or pain in the pursuit of valued life activities (Harris, 2009; McCracken, Vowles, & Eccleston, 2008), making it a continuous psychological act rather than permanent or fixed (Twohig & Hayes, 2008). The opposite of acceptance then, is experiential avoidance, meaning one's natural tendency to avoid or deny private events like thoughts, sensations, or emotions (Hayes et al., 2004). Individuals dealing with a life-threatening illness like ovarian cancer commonly cope through avoidance which often increases their level of suffering (Wilson & Murrell, 2004). In terms of ACT, pain is an inevitable part of life, and the avoidance of this reality is what creates psychological distress and suffering (Wilson & DuFrene, 2010; Hayes et al., 2004; McCracken & Velleman, 2010). In other words, acceptance means acknowledging internal experiences (i.e., memories, sensations, thoughts) without trying to alter, avoid, or control those events (Stoddard & Afari, 2014). Acceptance does not mean liking, wanting, or approving, rather it simply means the willingness to have an experience despite the aversive affect (Wilson & DuFrene, 2010). For example, if a person loves to garden and suffers from arthritis, instead of avoiding it all together, they may actively choose to participate in gardening activities that they are capable of, despite the presence of pain.

Changes in willingness and acceptance have been associated with distress and quality of life through several empirically validated studies examining psychological concerns amongst various health populations (Feros, Lane, Ciarrochi, & Blackledge, 2013; Veehof, Oskam, Schreurs, & Bohlmeijer, 2010; Tang et al., 2016). More specifically, level of acceptance has been proven as a predictor for distress and mood in women with cancer (Stanton, Danoff-Burg, & Huggins, 2002) and higher acceptance has been associated with less disability in various samples of chronic migraine patients (Dindo, Recober, Marchman, O'Hara, & Turvey, 2014; Foote, Hamer, Roland, Landy, & Smitherman, 2016). Women diagnosed with arthritis and/or fibromyalgia reported the willingness to acknowledge the chronicity of their condition led to the ability to self-manage the pain and have a better quality of life (LaChapelle, Lavoie, and Boudreau, 2008). An intervention with acceptance and willingness as a partial target showed significant improvements in approximately 75% of participants. Such areas of improvement were for pain, depression, anxiety, disability, and physical performance (Vowels & McCracken, 2008). Similarly, a 9-week intervention with chronic pain individuals revealed a statistically significant increase in acceptance was associated with three quarters of participants improving in one or more outcome measure (i.e., physical composite, emotional composite, depression, anxiety, pain-related anxiety; Baranoff, Hanrahan, Burke, Connor, 2016). More so, studies on women with breast cancer revealed acceptance-based coping strategies to be associated with less psychological distress in comparison to avoidance-based coping strategies (Carver et al., 1993; Politi, Enright, & Weihs, 2007). Likewise, Stanton et al. (2000) provided evidence of women experiencing significantly greater quality of life by coping through their diagnosis with acceptance of cognitions and emotions. Unfortunately, there is limited research with willingness and acceptance among women with ovarian cancer. Rost, Wilson, Buchanan, Hildebrandt, & Mutch (2012) completed an intervention with women whose ovarian cancer was in advanced stages. Women who received the intervention targeting processes like willingness and acceptance reported a significant increase in quality of life and decrease in psychological distress, despite the increasing debilitation of their illness. This and the other mentioned studies demonstrate the crucial impact willingness and acceptance has on pain, physical impairment, and psychological distress.

Hypotheses

The purpose of this study was to examine the interplay between willingness and acceptance, pain, physical impairment, and psychological distress with data obtained from women diagnosed with ovarian or fallopian tube cancer. Knowing the potential relationship between these variables, the intent of this study was to build on the Norton et al. (2005) model in which perceived control mediated the direct relationship between physical impairment and psychological distress. Specifically, it was proposed that willingness and acceptance may mediate the direct relationship between pain, physical impairment, and psychological distress, using a correlational design. It was hypothesized that patients who report high levels of pain and physical impairment, who also score high on measures of acceptance, will report lower levels of psychological distress in comparison to patients with impairments who score low in acceptance. It was expected that data from this study would provide psychologists with more information about variables that predict distress among women with cancer and ultimately lead to further development and improvement in psychological interventions for individuals coping with cancer.

METHODS

Participants

A total of 14 women participated in this study during a routine scheduled oncology appointment. Participants median age was 63 years, and they described themselves as Caucasian/White (*n* = 13) and Native/Indian American (*n* = 1). Marital status and household income varied among participants while a majority of the sample had a college or graduate degree. Participants were either diagnosed with ovarian cancer (*n* = 12) or fallopian cancer (*n* = 2). A majority of the sample reported having their diagnosis for less than four years and were either in Stage III, IV, or remission of their disease. Demographic data collected is presented in Table 1. Three participants were excluded from further analyses because of failure to complete all required measures, making the final *n* = 11.

Procedure

Approval from the Missouri State University IRB was obtained prior to participant recruitment (IRB-FY2018-309; Appendix A). Participants were recruited at an outpatient clinic during their scheduled appointments for cancer treatment. Participants were approached by investigators and given a brief overview of the study before giving verbal confirmation that they would like to participate. The inclusion criteria were: (a) primary diagnosis of a gynecological cancer, Stages I-IV or In Remission, (b) the patient is undergoing or has undergone treatment for gynecological cancer, (c) the patient is at least 18 years of age or older, and (d) the patient is proficient in English language reading and writing. Once participants provided consent they were given paper questionnaire forms to complete during the duration of their visit.

Measures

Demographics. Information regarding demographics included the patient's age, length of diagnosis, cancer stage, treatment stage, race/ethnicity, education level, marital status, and average household income (See Table 1).

Psychological Distress. Psychological distress was measured using an abbreviated version of the Profile of Mood States (POMS; Grove & Prapavessis, 1992; See Appendix B) which is a measure of mood states and perception of mood. Participants answered the 40-item questionnaire with higher scores indicating more severe mood disturbance. The scale utilized a 0-4 ranking system where each item was rated on a scale from 0 (not at all) to 4 (extremely). A total mood disturbance score was derived by adding the totals for the negative subscales (tension, depression, anger, fatigue, and confusion) and then subtracting the sum of the positive subscales (vigor and esteem-related affect).

Physical Impairment. The CAncer Rehabilitation Evaluation System Short Form for Research (*CARES-SF* $\alpha = 0.70$; Schag, Ganz, & Heinrich, 1991) was used to evaluate an individual's ability and degree of difficulty to perform daily activities/tasks. For the purpose of this study, only the first 10 items of the CARES-SF were utilized for data analysis as these items were specific to physical impairment. Each item was rated on a 5-point scale from 0 (not at all) to 4 (very much) and a total score were derived by summing the Likert items. Higher scores are related to greater levels of physical impairment.

Pain. The Chronic Pain Acceptance Questionnaire- Revised (CPAQ- Revised $\alpha = 0.78$-0.82; McCracken, Vowels, & Eccleston, 2004; See Appendix B) was used to measure acceptance of pain by evaluating 2 factors- activity engagements and pain willingness. Participants rated 20-items on a 7-point scale from 0 (never true) to 6 (always true). A total score was derived by adding the rated Likert items. Higher scores are related to greater levels of pain acceptance and indicate less pain related disability and distress.

Willingness and Acceptance. A revised version of the Acceptance and Action Questionnaire (*AAQ-II* $\alpha = 0.91$; Bond et al., 2011; Hayes et al., 2004; See Appendix B) was used to evaluate the ACT principles of willingness and acceptance. The measure consists of 7-items and utilizes a 7-point scale from 1 (never true) to 7 (always true). A total score was derived by adding the rated Likert items, with lower scores suggesting participants experience greater levels of willingness and acceptance.

RESULTS

Correlations of Measured Variables

Descriptive statistics for the measured variables are reported in Table 2 and Figure 1 provides a visual representation of the hypothesized model. To evaluate the relationship between physical impairment, pain, acceptance, and psychological distress, bivariate correlations were performed. In reference to our hypothesized mediational model, it was expected that the predictive variables (pain, physical impairment, and acceptance) would be correlated with the outcome variable (psychological distress). Figure 2, Figure 3, Figure 4, and Figure 5 provide visual examples of the scatterplots and the bivariate correlations are presented in Table 3. The scatterplots revealed no outlier issues, indicating the correlations are most likely not spurious. However, the acceptance scores appear to have a restricted range, with participants showing very little variability among their relatively low reported scores. Unfortunately, the bivariate correlations revealed no significant relationships between physical impairment and psychological distress, $r(9) = 0.44$, $p = 0.18$, pain and psychological distress, $r(9) = -0.34$, $p = 0.31$, or acceptance and psychological distress, $r(9) = -0.11$, $p = 0.74$. The insignificant relationships between the hypothesized mediation variable (acceptance) and outcome variable (psychological distress) thus precluded the testing of the proposed model. Important to note however, are the relationships found among acceptance, physical impairment, and pain. The acceptance correlation with physical impairment was found to be significant, $r(9) = 0.62$, $p = .043$. Since higher scores on the AAQ-II and CARES-SF both suggest greater impairment, this relationship is consistent with our expectations. Although weak and insignificant, the negative trend between acceptance and pain *r*(9) = -0.43, *p* = 0.19 is in concordance with our hypothesis that greater levels of acceptance will be associated with lower levels of pain.

After reconsideration of the measurement (CPAQ) utilized for pain, a new variable for pain was created through response item number 9 on the CARES-SF, “I frequently have pain.” A significant correlation was then found between physical impairment and pain, r(9) = 0.76, p = 0.01. This aligns with our expectations and the literature describing higher levels of reported pain to be associated with greater levels of physical impairment.

Multiple Linear Regression

With the dependent variable (psychological distress) not being significantly related to the predictor variables, we were unable to complete the proposed testing of the hypothesized model. However, we further explored the first part of our hypothesized mediation model as a result of the significant correlations that were found. Specifically, a subsequent multiple regression exploratory analysis was conducted. The findings are presented in Table 4 and Table 5, respectively. Results indicated that physical impairment (β = 0.54, *p* = 0.13) and CPAQ-pain (β = -0.17, *p* = 0.61) were not significant predictors of acceptance, F(2,8) = 2.68, p = 0.13. However, another analysis was employed using the new pain variable. Results indicated that physical impairment (β = 1.3, *p* = 0.002) and CARES-pain (β = -0.90, *p* = 0.01) were significant predictors of acceptance, F(2,8) = 10.56, p = 0.006. These findings provide support for the first part of our hypothesis, in which levels of pain and physical impairment directly influence levels of willingness and acceptance.

DISCUSSION

Summary

Although the small sample prevented the hypothesized model to be determined, the general trend of data provided insight into the potential relationship among identified variables. Given the significant findings between physical impairment and psychological distress with such few participants and the insignificant but negative relationship between pain and psychological distress, we can assume our hypotheses to be on the right track. Overall this study demonstrates an exploration of the impact physical impairment, pain, and willingness and acceptance have on the psychological wellbeing in women diagnosed with gynecological cancer. Our findings add to the literature of rarely studied cancers by providing information of factors related to the measured variables and show support for further analyses to be explored.

Data Limitations

The limitations of this study are significant to note. Unfortunately, the limited number of participants prevented the ability to utilize the intended mediation analysis for this study. While the small sample size (low power) most likely contributed to the failure to detect significant findings, the hypothesized trends that were identified provide an opening for future research to be conducted on the relationship between targeted variables. Specifically, the relationship found between pain, physical impairment, and acceptance demonstrates the effect physiological symptoms in women with ovarian cancer can have on the way one copes with their experience. The failure to be able to test the mediation model was due to the weak non-significant correlation between acceptance and distress. In order to gain a better understanding of the relationship between cancer related variables and the impact each has on the psychological wellbeing of women with genealogical cancers, expansion of this study is vital.

Another limitations was the utilization of the CPAQ as a measure for pain. Although the CPAQ provides useful information about pain willingness and activity engagement despite pain, having a measure that assesses pain independently of other factors may allow for a more precise understanding of cancer related pain. The CPAQ may be a better source of measuring acceptance, and thus should be considered in conjunction with the AAQ-II

Lastly, variables and measures that were not relevant to our hypothesized model were collected but have not yet been analyzed or have yet to be collected. Future analysis pertaining to personality, perceived control, social support, and other potential factors that may impact how women cope with their cancer, may expand our knowledge into the relationship.

Future Application and Research

Our findings related to aspects influencing the level of psychological distress in gynecological cancer patients, provide a segue for future research to explore these variables more thoroughly. Given the findings of this study, focus should be shifted to areas like physical activity and acceptance. This suggestion is supported by research inferring better psychological outcomes among cancer patients who demonstrate greater levels of willingness and acceptance (Hulbert-Williams, Storey, & Wilson, 2015; Feros, Lane, Ciarrochi, & Blackledge, 2013) and participate in greater levels of physical activity (Faul et al., 2011). Being diagnosed with a life-threatening illness can produce a sense of avoidance and refusal to experience life as it is. Although research is limited in gynecological populations, interventions targeting willingness and acceptance in individuals with a range of cancer have demonstrated a decrease in symptoms like physical pain and psychological distress (Fashler, Weinrib, Azam, & Katz, 2018). Likewise, greater levels of distress have been found among cancer patients who cope through avoidance over acceptance (Dunkel-Schetter, Feinstein, Taylor, & Falke, 1992) while ACT interventions have decreased pain severity and impairment in individuals with chronic pain (Wetherell et al., 2011). Given these studies and referring to the model proposed by Norton et al. (2004), we suggest future research consider acceptance as a variable in predicting psychological distress among women with gynecological cancers.

Unfortunately, women often reduce their activity level during the course of their diagnosis with ovarian cancer leading to a negative impact on their quality of life (Beesley et al., 2011). Although performing daily activities is a common issue for individuals who have cancer, women with breast and ovarian cancer have reported interest in exercise programs that are modified to their illness (i.e., in home, with other cancer patients, light exercise; Stevinson et al., 2009; Lowe, Watanabe, Baracos, & Courneya, 2012).When a home-based physical activity intervention was implemented with metastatic breast cancer patients, results showed significant increase in motivation and vigor (Pinto, Frierson, Rabin, Trunzo, & Marcus, 2005). More so, improvements were found in physical performance, fatigue and overall quality of life among individuals with lung and gastrointestinal tumors (Dimeo, Thomas, Raabe-Menssen, Pröpper, Mathias, 2004). The studies provide further support of the potential impact physical activity can have on physical impairment and overall functioning by those experiencing cancer. Thus, future research may consider implementing physical activity into our proposed model.

Further exploration of our hypotheses and other related variables is vital in expanding our knowledge of factors that influence psychological wellbeing among cancer patients. Additionally, the scarcity in research conducted with gynecological cancer patients infers the need to broaden the field of cancer research by working with these women to develop a thorough understanding of how to help one cope with their illness.

REFERENCES

American Cancer Society. (2017). Key Statistics for Ovarian Cancer. *American Cancer Society.* Retrieved from https://www.cancer.org/cancer/ovarian-cancer/about/key-statistics.html

Arch, J. J., & Mitchell, J. L. (2016). An Acceptance and Commitment Therapy (ACT) group intervention for cancer survivors experiencing anxiety at re-entry. *Psycho-Oncology*, *25*(5), 610-615.

Arnstein, P., Caudill, M., Mandle, C. L., Norris, A., & Beasley, R. (1999). Self-efficacy as a mediator of the relationship between pain intensity, disability and depression in chronic pain patients. *Pain*, *80*(3), 483-491.

Bárez, M., Blasco, T., Fernández-Castro, J., & Viladrich, C. (2009). Perceived control and psychological distress in women with breast cancer: A longitudinal study. *Journal of Behavioral Medicine, 32*(2), 187.

Baranoff, J. A., Hanrahan, S. J., Burke, A. L., & Connor, J. P. (2016). Changes in acceptance in a low-intensity, group-based acceptance and commitment therapy (ACT) chronic pain intervention. *International Journal of Behavioral Medicine, 23*(1), 30-38.

Beesley, V. L., Price, M. A., Butow, P. N., Green, A. C., Olsen, C. M., & Webb, P. M. (2011). Physical activity in women with ovarian cancer and its association with decreased distress and improved quality of life. *Psycho-Oncology, 20*(11), 1161-1169. doi:10.1002/pon.1834.

Bodurka-Bevers, D., Basen-Engquist, K., Carmack, C. L., Fitzgerald, M. A., Wolf, J. K., de Moor, C., & Gershenson, D. M. (2000). Depression, anxiety, and quality of life in patients with epithelial ovarian cancer. *Gynecologic Oncology*, *78*(3), 302-308.

Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., Waltz, T., & Zettle, R. D. (2011). Preliminary psychometric properties of the Acceptance and Action Questionniare - II: A revised measure of psychological flexibility and experiential avoidance. *Behavior Therapy, 42*, 676-688

Campbell, G., Hagan, T., Gilbertson-White, S., Houze, M., & Donovan, H. (2016). Cancer and treatment-related symptoms are associated with mobility disability in women with ovarian cancer: A cross-sectional study. *Gynecologic Oncology*, *143*(3), 578-583.

Carver, C. S., Pozo, C., Harris, S. D., Noriega, V., Scheier, M. F., Robinson, D. S., & Clark, K. C. (1993). How coping mediates the effect of optimism on distress—A study of women with early-stage breast-cancer. *Journal of Personality and Social Psychology*, *65*(2), 375-390.

Centers for Disease Control and Prevention (2017). Basic Information about Ovarian Cancer. *Division of Cancer Prevention and Control*. Retrieved from https://www.cdc.gov/cancer/ovarian/basic_info/index.htm

Centers for Disease Control and Prevention [CDC]. (2018). Gynecologic cancers. *Centers for Disease Control and Prevention*. Retrieved from https://www.cdc.gov/cancer/gynecologic/index.htm

Cleeland, C. S. (1984). The impact of pain on the patient with cancer. *Cancer*, *54*(S2), 2635-2641.

Collins, Y., Holcomb, K., Chapman-Davis, E., Khabele, D., & Farley, J.H. (2014).Gynecologic cancer disparities: a report from the Health Disparities Taskforce ofthe Society ofGynecologic Oncology. *Gynecologic Oncology, 133*, 353-361.
doi: https://doi.org/10.1016/j.ygyno.2013.12.039.

Dimeo, F. C., Thomas, F., Raabe-Menssen, C., Pröpper, F., & Mathias, M. (2004). Effect of aerobic exercise and relaxation training on fatigue and physical performance of cancer patients after surgery. A randomised controlled trial. *Supportive Care in Cancer*, *12*(11), 774-779.

Dindo, L., Recober, A., Marchman, J., O'Hara, M. W., & Turvey, C. (2014). One-day behavioral intervention in depressed migraine patients: Effects on Headache. *Headache: The Journal of Head and Face Pain*, *54*(3), 528-538.

DellaRipa, J., Conlon, A., Lyon, D. E., Ameringer, S. A., Lynch Kelly, D., & Menzies, V. (2015). Perceptions of Distress in Women with Ovarian Cancer. *Oncology Nursing Forum*, *42*(3), 292-300.

Donovan, H. S., Hartenbach, E. M., & Method, M. W. (2005). Patient–provider communication and perceived control for women experiencing multiple symptoms associated with ovarian cancer. *Gynecologic Oncology, 99*(2), 404-411.

Dunkel-Schetter, C., Feinstein, L. G., Taylor, S. E., & Falke, R. L. (1992). Patterns of coping with cancer. *Health Psychology*, *11*(2), 79.

Fashler, S. R., Weinrib, A. Z., Azam, M. A., & Katz, J. (2018). The use of acceptance and commitment therapy in oncology settings: a narrative review. *Psychological Reports*, *121*(2), 229-252.

Faul, L. A., Jim, H. S., Minton, S., Fishman, M., Tanvetyanon, T., & Jacobsen, P. B. (2011). Relationship of exercise to quality of life in cancer patients beginning chemotherapy. *Journal of Pain and Symptom Management, 41*(5), 859-869. doi:10.1016/j.jpainsymman.2010.07.019.

Feros, D. L., Lane, L., Ciarrochi, J., & Blackledge, J. T. (2013). Acceptance and Commitment Therapy (ACT) for improving the lives of cancer patients: a preliminary study. *Psycho-Oncology*, *22*(2), 459-464.

Ferrell, B., Smith, S. L., Cullinane, C. A., & Melancon, C. (2003). Psychological well- being and quality of life in ovarian cancer survivors. Cancer: *Interdisciplinary International Journal of the American Cancer Society, 98*(5), 1061-1071.

Foote, H. W., Hamer, J. D., Roland, M. M., Landy, S. R., & Smitherman, T. A. (2016). Psychological flexibility in migraine: A study of pain acceptance and values-based action. *Cephalalgia*, *36*(4), 317-324.

Goff, B. A., Mandel, L. S., Melancon, C. H., & Muntz, H. G. (2004). Frequency of symptoms of ovarian cancer in women presenting to primary care clinics. *Jama*, *291*(22), 2705-2712.

Goncalves, V., Jayson, G., & Tarrier, N. (2008). A longitudinal investigation of psychological morbidity in patients with ovarian cancer. *British Journal of Cancer, 99*(11), 1794.

Grove, J.R., & Prapavessis, H. (1992). Preliminary evidence for the reliability and validity of an abbreviated Profile of Mood States. *International Journal of Sport Psychology, 23*, 93-109.

Harris, R. (2009). *ACT Made Simple : An Easy-To-Read Primer on Acceptance and Commitment Therapy*. Oakland, CA: New Harbinger Publications

Hayes, S. C., Wilson, K. G., Gifford, E. V., Bissett, R., Piasecki, M., Batten, S. V., Byrd, M., & Gregg, J. (2004). A preliminary trial of Twelve-Step Facilitation and Acceptance and Commitment Therapy with polysubstance-abusing methadone-maintained opiate addicts. *Behavior Therapy, 35*(4), 667-688.

Hennessy, B. T., Coleman, R. L., & Markman, M. (2009). Ovarian cancer. *The Lancet*, *374*(9698), 1371-1382.

Hipkins, J. W., Tarrier, N., & Jayson, G. (2004). Social support, anxiety and depression after chemotherapy for ovarian cancer: A prospective study. *British Journal of Health Psychology, 9*, 569–581.

Howell, D., Fitch, M. I., & Deane, K. A. (2003). Impact of ovarian cancer perceived by women. *Cancer Nursing, 26*(1), 1-9.

Hulbert-Williams, N. J., Storey, L., & Wilson, K. G. (2015). Psychological interventions for patients with cancer: psychological flexibility and the potential utility of Acceptance and Commitment Therapy. *European Journal of Cancer Care*, *24*(1), 15-27.

Karunanithi, G., Sagar, R. P., Joy, A., & Vedasoundaram, P. (2018). Assessment of Psychological Distress and its Effect on Quality of Life and Social Functioning in Cancer Patients. *Indian Journal of Palliative Care*, *24*(1), 72-77.

Kornblith, A. B., Thaler, H. T., Wong, G., Vlamis, V., Lepore, JM., Loseth, D. B., & Portenoy, R. K. (1995). Quality of life of women with ovarian cancer. *Gynecologic oncology*, *59*(2), 231-242.

LaChapelle, D. L., Lavoie, S., & Boudreau, A. (2008). The meaning and process of pain acceptance. Perceptions of women living with arthritis and fibromyalgia. *Pain Research and Management*, *13*(3), 201-210.

Low, C. A., Stanton, A. L., Thompson, N., Kwan, L., & Ganz, P. A. (2006). Contextual Life Stress and Coping Strategies as Predictors of Adjustment to Breast Cancer Survivorship. *Annals of Behavioral Medicine, 32*(3), 235-244. doi:10.1207/s15324796abm3203_10.

Lowe, S. S., Watanabe, S. M., Baracos, V. E., & Courneya, K. S. (2012). Determinants of physical activity in palliative cancer patients: an application of the theory of planned behavior. *Journal of Support Oncology, 10*(1), 30-36. doi:10.1016/j.suponc.2011.07.005.

Lutgendorf, S. K., Slavich, G. M., DeGeest, K., Goodheart, M., Bender, D., Thaker, P. H., & Collins, K. (2013). Non-cancer life stressors contribute to impaired quality of life in ovarian cancer patients. *Gynecologic Oncology, 131*(3), 667-673.

McCraken, L. M., Vowles, K. E. & Eccleston, C. (2004). Acceptance of chronic pain: Component analysis and a revised assessment method. *Pain, 107*, 159-166.

McCracken, L. M., & Velleman, S. C. (2010). Psychological flexibility in adults with chronic pain: a study of acceptance, mindfulness, and values-based action in primary care. *Pain*, *148*(1), 141-147.

McCracken, L. M., & Vowles, K. E. (2008). A prospective analysis of acceptance of pain and values-based action in patients with chronic pain. *Health Psychology*, *27*(2), 215-220. doi:10.1037/0278-6133.27.2.215

Norton, T. R., Manne, S. L., Rubin, S., Carlson, J., Hernandez, E., Edelson, M. I., & Bergman, C. (2004). Prevalence and predictors of psychological distress among women with ovarian cancer. *Journal of Clinical Oncology*, *22*(5), 919-926.

Ovarian Cancer Research Fund Alliance. (2016). Chemotherapy Side Effects. *Ovarian Cancer Research Fund Alliance*. Retrieved from https://ocrfa.org/patients/about-ovarian-cancer/treatment/chemotherapy-side-effects/

Pinto, B. M., Frierson, G. M., Rabin, C., Trunzo, J. J., & Marcus, B. H. (2005). Home-based physical activity intervention for breast cancer patients. *Journal of Clinical Oncology*, *23*(15), 3577-3587.

Politi, M. C., Enright, T. M., & Weihs, K. L. (2007). The effects of age and emotional acceptance on distress among breast cancer patients. *Supportive Care in Cancer*, *15*(1), 73-79.

Portenoy, R. K., Kornblith, A. B., Wong, G., Vlamis, V., Lepore, J. M., Loseth, D. B., & Hoskins, W. J. (1994). Pain in ovarian cancer patients. Prevalence, characteristics, and associated symptoms. *Cancer*, *74*(3), 907-915.

Pulles, W. A., & Oosterman, J. M. (2011). The Role of Neuropsychological Performance in the Relationship Between Chronic Pain and Functional Physical Impairment. *Pain Medicine*, *12*(12), 1769-1776. doi:10.1111/j.1526-4637.2011.01266.x

Price, M. A., Bell, M. L., Sommeijer, D. W., Friedlander, M., Stockler, M. R., Webb, P. M., & Butow, P. N. (2013). Physical symptoms, coping styles and quality of life in recurrent ovarian cancer: a prospective population-based study over the last year of life. *Gynecologic Oncology*, *130*(1), 162-168.

Ranchor, A. V., Wardle, J., Steptoe, A., Henselmans, I., Ormel, J., & Sanderman, R. (2010). The adaptive role of perceived control before and after cancer diagnosis: A prospective study. *Social Science Medicine, 70*(11), 1825-1831. doi:10.1016/j.socscimed.2009.10.069.

Ridner, S. H. (2004). Psychological distress: concept analysis. *Journal of Advanced Nursing*, *45*(5), 536-545.

Rolnick, S. J., Jackson, J., Nelson, W. W., Butani, A., Herrinton, L. J., Hornbrook, M., & Coughlin, S. S. (2007). Pain management in the last six months of life among women who died of ovarian cancer. *Journal of Pain and Symptom Management*, *33*(1), 24-31.

Rost, A. D., Wilson, K., Buchanan, E., Hildebrandt, M. J., & Mutch, D. (2012). Improving psychological adjustment among late-stage ovarian cancer patients: Examining the role of avoidance in treatment. *Cognitive and Behavioral Practice, 19*(4), 508-517. doi:10.1016/j.cbpra.2012.01.003.

Schag, C. A. C., Ganz, P. A., & Heinrich, R. L. (1991). CAncer rehabilitation evaluation system–short form (CARES-SF). A cancer specific rehabilitation and quality of life instrument. *Cancer, 68*(6), 1406-1413.

Schootman, M., Aft, R., & Jeffe, D. B. (2009). An evaluation of lower-body functional limitations among long-term survivors of 11 different types of cancers. *Cancer*, *115*(22), 5329-5338.

Stanton, A. L., Danoff-burg, S., & Huggins, M. E. (2002). The first year after breast cancer diagnosis: hope and coping strategies as predictors of adjustment. *Psycho-Oncology*, *11*(2), 93-102.

Stanton, A. L., Danoff-burg, Cameron, C. L., Bishop, M., Collins, C. A., Kirk, S. B., Sworowski, L. A., & Twillman, R. (2000). Emotionally expressive coping predicts psychological and physical adjustment to breast cancer. *Journal of Consulting and Clinical Psychology, 68*, 875-882.

Stavraka, C., Ford, A., Ghaem-Maghami, S., Crook, T., Agarwal, R., Gabra, H., & Blagden, S. (2012). A study of symptoms described by ovarian cancer survivors. *Gynecologic Oncology*, *125*(1), 59-64.

Stevinson, C., Faught, W., Steed, H., Tonkin, K., Ladha, A. B., Vallance, J. K., & Courneya, K. S. (2007). Associations between physical activity and quality of life in ovarian cancer survivors. *Gynecologic Oncology*, *106*(1), 244-250.

Stoddard, J. A., & Afari, N. (2014). *The Big Book of ACT Metaphors: A Practitioner's Guide to Experiential Exercises and Metaphors in Acceptance and Commitment Therapy*. Oakland, CA: New Harbinger Publications

Tang, S. T., Chang, W. C., Chen, J. S., Chou, W. C., Hsieh, C. H., & Chen, C. H. (2016). Associations of prognostic awareness/acceptance with psychological distress, existential suffering, and quality of life in terminally ill cancer patients' last year of life. *Psycho-Oncology*, *25*(4), 455-462.

Twohig, M., & Hayes, S. C. (2008). *ACT Verbatim for Depression and Anxiety: Annotated Transcripts for Learning Acceptance and Commitment Therapy*. Oakland, CA: New Harbinger & Reno, NV: Context Press.

Veehof, M. M., Oskam, M. J., Schreurs, K. M., & Bohlmeijer, E. T. (2011). Acceptance-based interventions for the treatment of chronic pain: a systematic review and meta-analysis. *PAIN®*, *152*(3), 533-542.

Vowles, K. E., & McCracken, L. M. (2008). Acceptance and values-based action in chronic pain: A study of treatment effectiveness and process. *Journal of Consulting And Clinical Psychology*, *76*(3), 397-407. doi:10.1037/0022-006X.76.3.397

Wilson, K. G., & Murrell, A. R. (2004). Values work in Acceptance and Commitment Therapy: Setting a Course for Behavioral Treatment. In Hayes, S. C., Follette, V. M., & Linehan, M. (Eds.), *Mindfulness & Acceptance: Expanding the cognitive-behavioral tradition*, New York: Guilford Press

Wilson, K., & DuFrene, T. (2010). *Things might go terribly, horribly wrong: A guide to life liberated from anxiety*. New Harbinger Publications.

Wetherell, J. L., Afari, N., Rutledge, T., Sorrell, J. T., Stoddard, J. A., Petkus, A. J., & Atkinson, J. H. (2011). A randomized, controlled trial of acceptance and commitment therapy and cognitive-behavioral therapy for chronic pain. *Pain*, *152*(9), 2098-2107.

Wilson, K. G., & Murrell, A. R. (2004). Values work in Acceptance and Commitment Therapy: Setting a Course for Behavioral Treatment. In Hayes, S. C., Follette, V. M., & Linehan, M. (Eds.), *Mindfulness & Acceptance: Expanding the Cognitive-Behavioral Tradition* (pp. 120-151). New York: Guilford Press.

World Health Organization. (2018). Disabilities. *Health Topics*. Retrieved From http://www.who.int/topics/disabilities/en/

Zabora, J., Brintzenhofeszoc, K., Curbow, B., Hooker, C., & Piantadosi, S. (2001). The prevalence of psychological distress by cancer site. *Psycho-Oncology*, *10*(1), 19-28.

Table 1. Demographic Data Summaries

Descriptive Statistics of Participant Demographic Data

Variable	*N*	*M*	Variance
Age	14	62.79	44-81
Race	14		
Caucasian/White	13		
Native/Indian American	1		
Education	14		
< High school	1		
High School Graduate	4		
College Degree	5		
Professional Degree	4		
Marital Status	13		
Married	7		
Divorced	4		
Single	1		
Widowed	1		
Average Household Income	12		
< $25k	3		
$25k - $34k	1		
$35k – $49k	3		
$50k - $74k	2		
$75k - $99k	2		
> $100k	1		
Primary Cancer Diagnosis	14		
Ovarian	12		
Fallopian	2		
Disease Stage	12		
Stage III	8		
Stage IV	2		
Remission	2		
Year(s) with initial diagnosis	14		
< 1	4		
1-2	4		
3-4	2		
5+	4		

*From date of survey completion

Table 2. Descriptive Statistics of Measured Variables

Variables	*n*	M	SD
Psychological Distress	11	113.18	23.09
Physical Impairment	11	59.82	7.51
Pain	11	64.73	10.47
Acceptance	11	18	2.72

Table 3. Bivariate Correlations between Measured Variables.

Variables	1	2	3	4	5
1. Psychological Distress					
2. Acceptance	-0.11				
3. Physical Impairment	0.44	0.62*			
4. CPAQ- Pain	-0.34	-0.43	-0.49		
5. CARES- Pain	0.44	0.09	0.76**	-0.15	

Note: *p < .05, **p < .01

Table 4. Multiple Regression Analysis with Original Pain Variable

Linear multiple regression with acceptance as dependent variable

Variable	*B*	*SE B*	*β*	*t*	*p*
Physical impairment	0.19	0.11	0.54	1.71	0.13
CPAQ- Pain	-0.04	0.08	-0.17	-0.53	0.61
R^2	0.40				
F	2.68				

Table 5. Multiple Regression Analysis with New Pain Variable

Linear multiple regression with acceptance as dependent variable

Variable	*B*	*SE B*	*β*	*t*	*p*
Physical impairment	0.47	0.10	1.30	4.57	0.002
CARES- Pain	-1.91	0.60	-0.90	-3.17	0.013
R^2	0.73				
F	10.56				

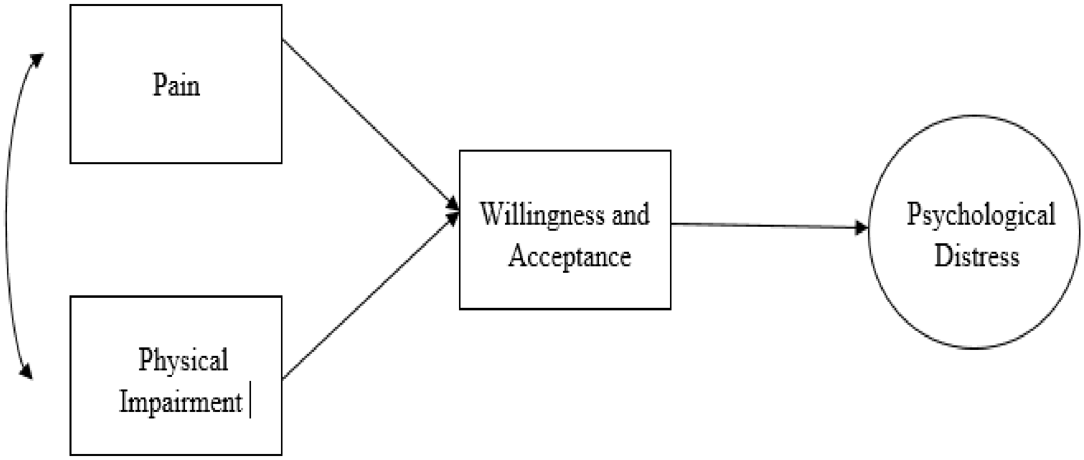

Figure 1. Hypothesized model of the mediation

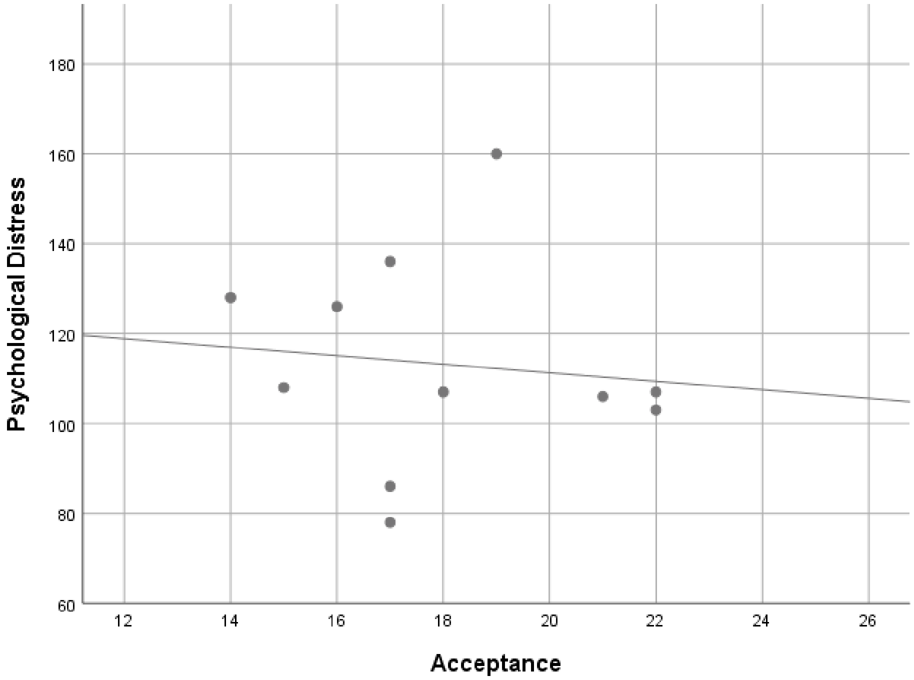

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Figure 2. Simple Scatter plot of DV and hypothesized mediation variable

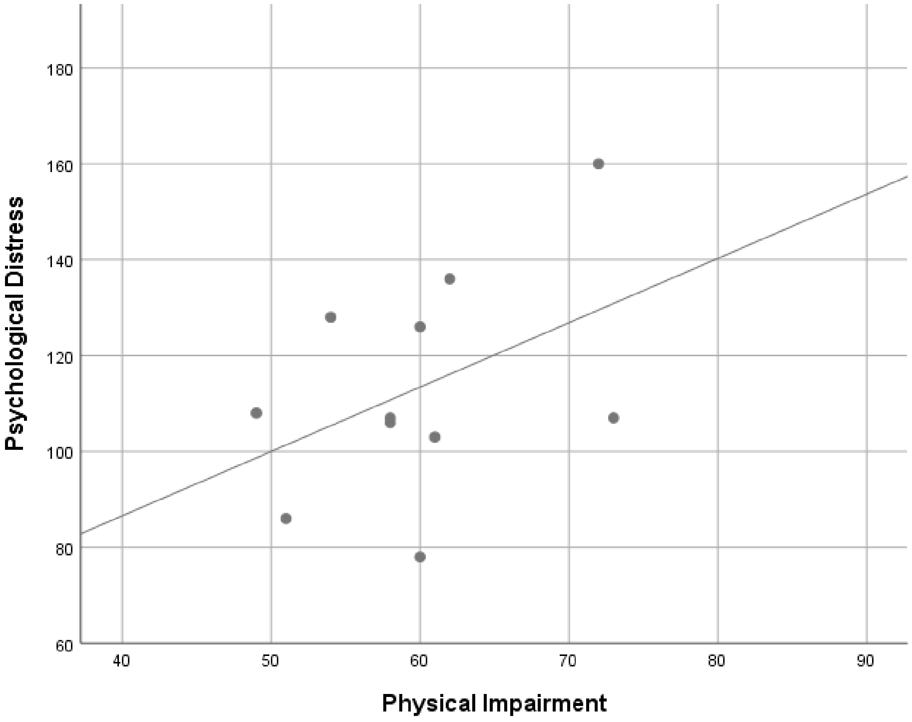

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Figure 3. Simple Scatter Plot of DV and physical impairment

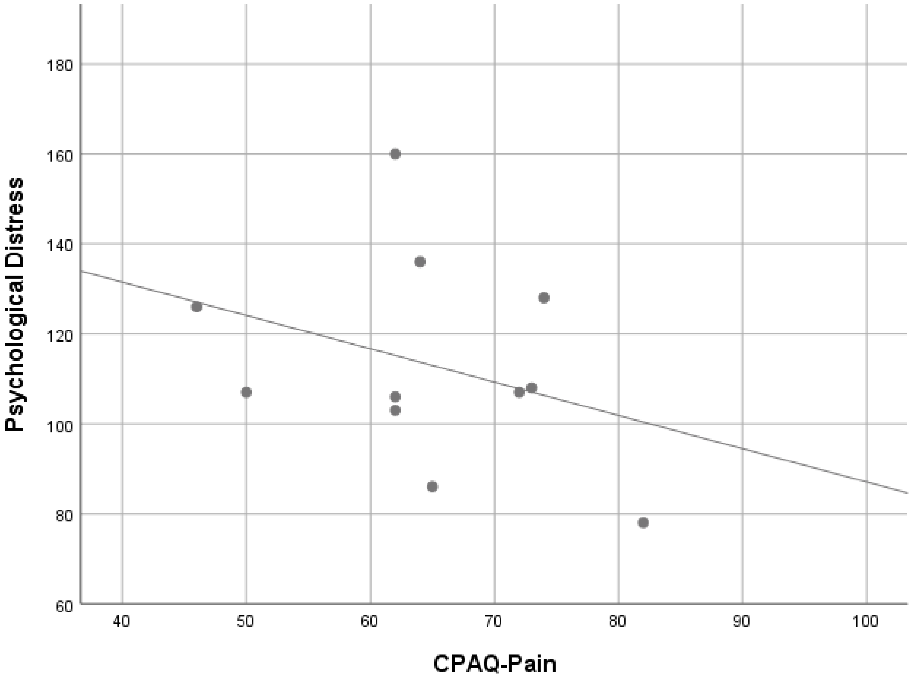

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Figure 4. Simple Scatter Plot of DV and Original Pain Variable

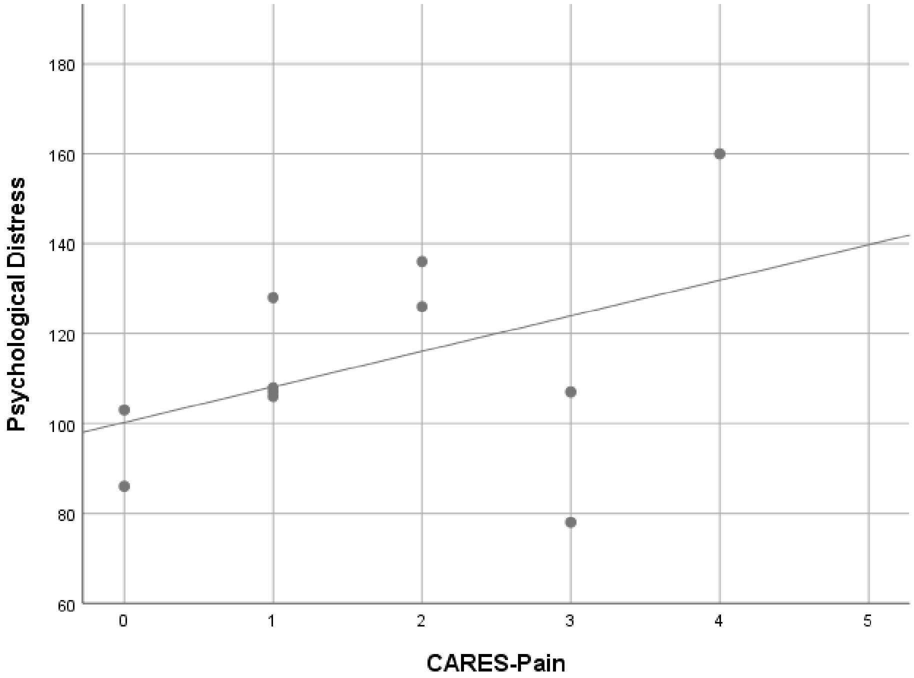

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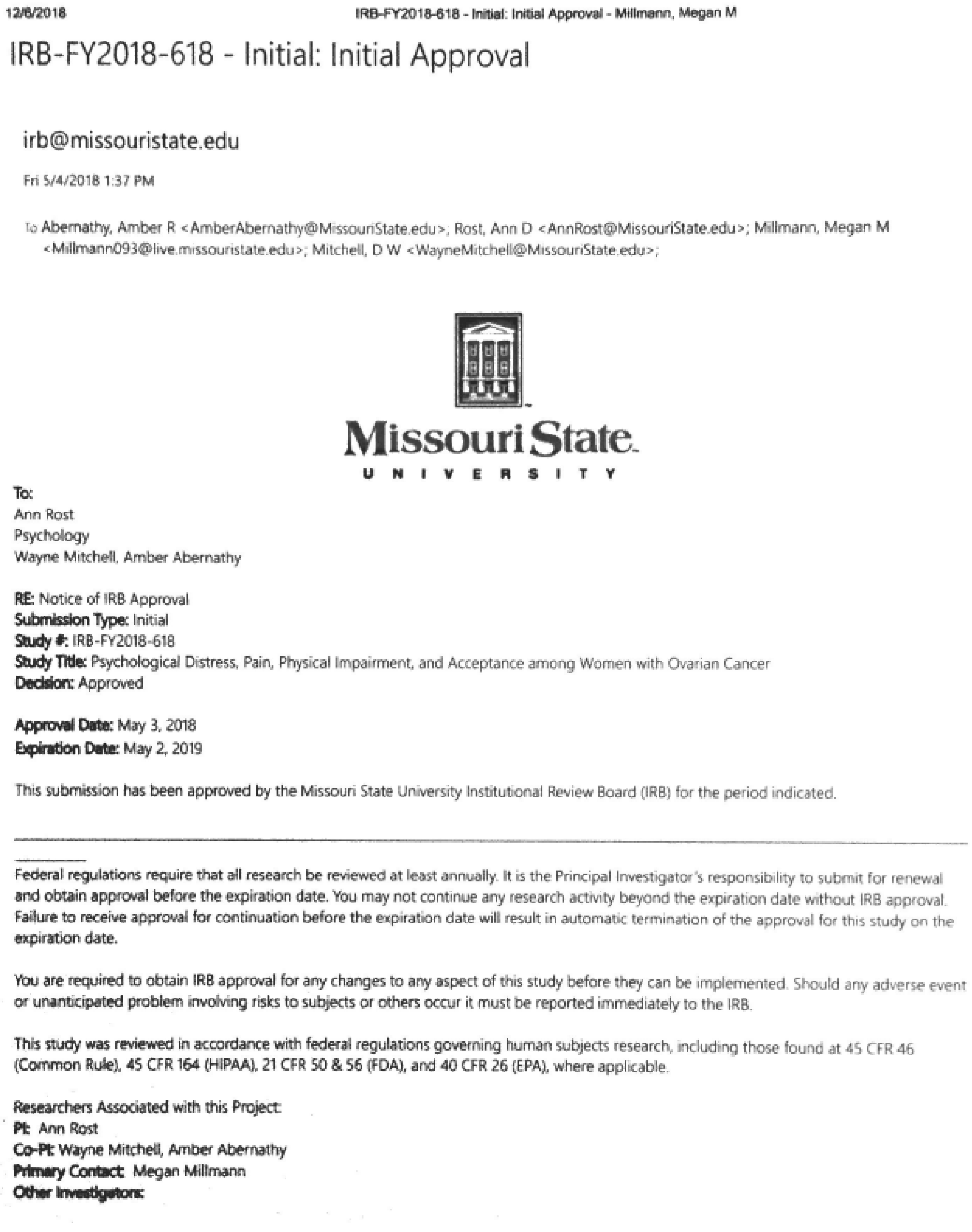
Figure 5. Simple Scatter Plot of DV and New Pain Variable

APPENDICES

Appendix A. Human Subjects IRB Approval



12/6/2018 IRB-FY2018-618 - Initial: Initial Approval - Millmann, Megan M

IRB-FY2018-618 - Initial: Initial Approval

irb@missouristate.edu

Fri 5/4/2018 1:37 PM

To Abernathy, Amber R <AmberAbernathy@MissouriState.edu>; Rost, Ann D <AnnRost@MissouriState.edu>; Millmann, Megan M <Millmann093@live.missouristate.edu>; Mitchell, D W <WayneMitchell@MissouriState.edu>;

Missouri State
UNIVERSITY

To:
Ann Rost
Psychology
Wayne Mitchell, Amber Abernathy

RE: Notice of IRB Approval
Submission Type: Initial
Study #: IRB-FY2018-618
Study Title: Psychological Distress, Pain, Physical Impairment, and Acceptance among Women with Ovarian Cancer
Decision: Approved

Approval Date: May 3, 2018
Expiration Date: May 2, 2019

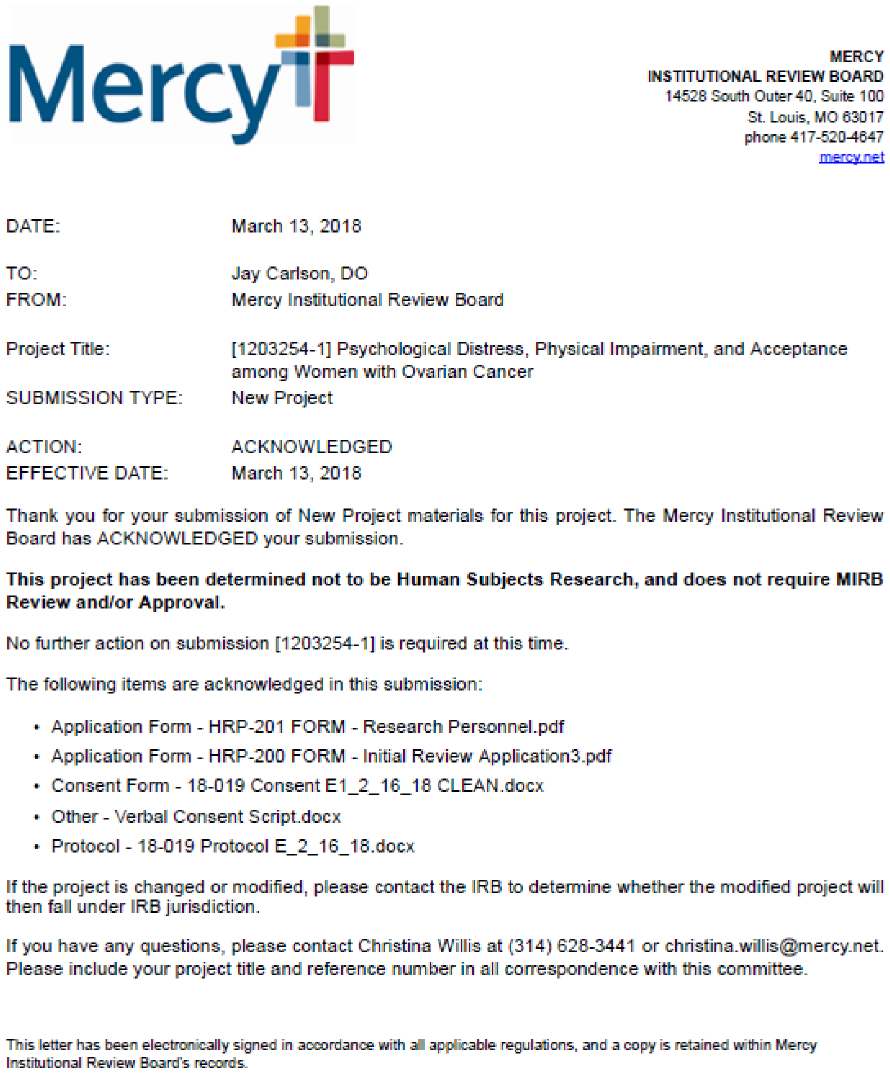
This submission has been approved by the Missouri State University Institutional Review Board (IRB) for the period indicated.

Federal regulations require that all research be reviewed at least annually. It is the Principal Investigator's responsibility to submit for renewal and obtain approval before the expiration date. You may not continue any research activity beyond the expiration date without IRB approval. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date.

You are required to obtain IRB approval for any changes to any aspect of this study before they can be implemented. Should any adverse event or unanticipated problem involving risks to subjects or others occur it must be reported immediately to the IRB.

This study was reviewed in accordance with federal regulations governing human subjects research, including those found at 45 CFR 46 (Common Rule), 45 CFR 164 (HIPAA), 21 CFR 50 & 56 (FDA), and 40 CFR 26 (EPA), where applicable.

Researchers Associated with this Project:
PI: Ann Rost
Co-PI: Wayne Mitchell, Amber Abernathy
Primary Contact: Megan Millmann
Other Investigators:



Mercy

MERCY
INSTITUTIONAL REVIEW BOARD
14528 South Outer 40, Suite 100
St. Louis, MO 63017
phone 417-520-4647
mercy.net

DATE:	March 13, 2018
TO:	Jay Carlson, DO
FROM:	Mercy Institutional Review Board
Project Title:	[1203254-1] Psychological Distress, Physical Impairment, and Acceptance among Women with Ovarian Cancer
SUBMISSION TYPE:	New Project
ACTION:	ACKNOWLEDGED
EFFECTIVE DATE:	March 13, 2018

Thank you for your submission of New Project materials for this project. The Mercy Institutional Review Board has ACKNOWLEDGED your submission.

This project has been determined not to be Human Subjects Research, and does not require MIRB Review and/or Approval.

No further action on submission [1203254-1] is required at this time.

The following items are acknowledged in this submission:

- Application Form - HRP-201 FORM - Research Personnel.pdf
- Application Form - HRP-200 FORM - Initial Review Application3.pdf
- Consent Form - 18-019 Consent E1_2_16_18 CLEAN.docx
- Other - Verbal Consent Script.docx
- Protocol - 18-019 Protocol E_2_16_18.docx

If the project is changed or modified, please contact the IRB to determine whether the modified project will then fall under IRB jurisdiction.

If you have any questions, please contact Christina Willis at (314) 628-3441 or christina.willis@mercy.net. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Mercy Institutional Review Board's records.

Appendix B. Measures

Appendix B-1 Demographic Information

Please answer the following questions.

Your Age:

How long have you had your diagnosis? (circle one)

Less than one year

1-2 years

3-4 years

5 years or more

Primary Race/Ethnicity (circle one):

Caucasian/White

African American/Black

Asian/Pacific Islander

Hispanic or Latino

Native American or American Indian

Other

Current Disease Stage (circle one):

Stage IStage IIStage IIIStage IVRemission

Highest completed education (circle one):

Less than High School

High school graduate

Some College

College Graduate

Graduate/Professional Degree

Marital Status (circle one)

Single (never married)

Married

Separated

Widowed

Divorced

Average Household Income (circle one):

Less than $25,000

$25,000-$34,999

$35,000-$49,999

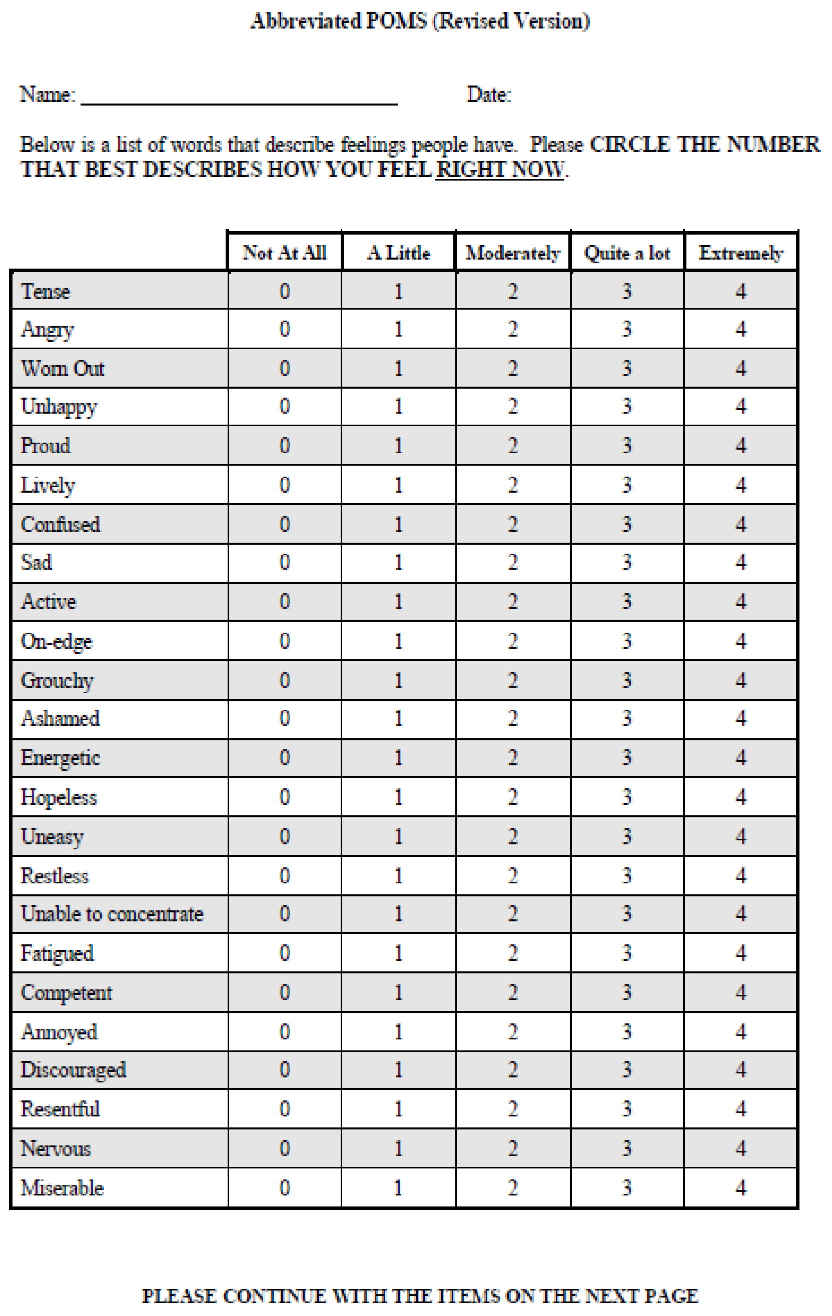
$50,000-$74,999

$75,000-$99,999

$100,000-149,999

$150,000 or more

Appendix B-2 Abbreviated Profile of Mood States (POMS)



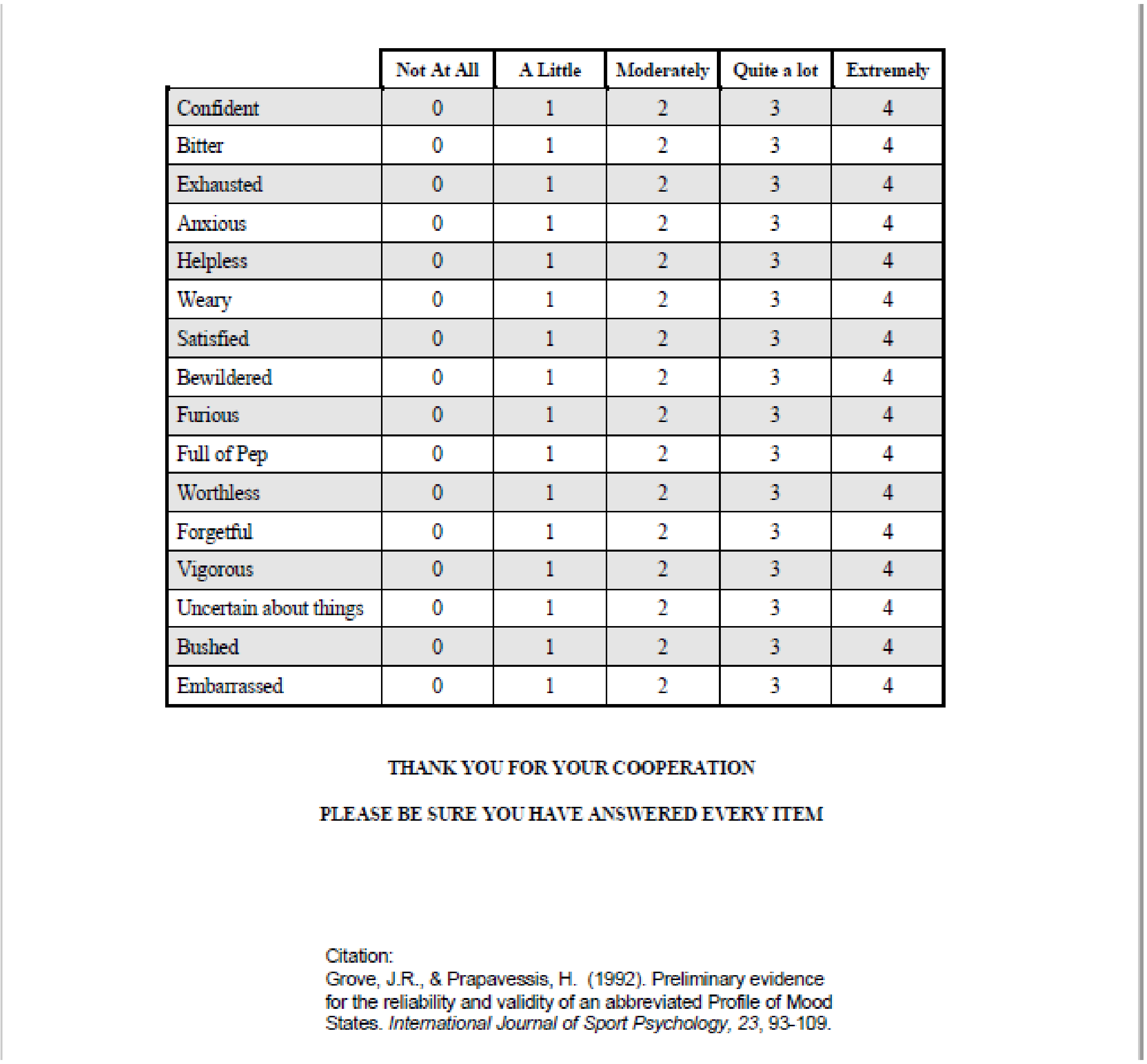
Abbreviated POMS (Revised Version)

Name: ______________________________ Date:

Below is a list of words that describe feelings people have. Please **CIRCLE THE NUMBER THAT BEST DESCRIBES HOW YOU FEEL <u>RIGHT NOW</u>**.

	Not At All	**A Little**	**Moderately**	**Quite a lot**	**Extremely**
Tense	0	1	2	3	4
Angry	0	1	2	3	4
Worn Out	0	1	2	3	4
Unhappy	0	1	2	3	4
Proud	0	1	2	3	4
Lively	0	1	2	3	4
Confused	0	1	2	3	4
Sad	0	1	2	3	4
Active	0	1	2	3	4
On-edge	0	1	2	3	4
Grouchy	0	1	2	3	4
Ashamed	0	1	2	3	4
Energetic	0	1	2	3	4
Hopeless	0	1	2	3	4
Uneasy	0	1	2	3	4
Restless	0	1	2	3	4
Unable to concentrate	0	1	2	3	4
Fatigued	0	1	2	3	4
Competent	0	1	2	3	4
Annoyed	0	1	2	3	4
Discouraged	0	1	2	3	4
Resentful	0	1	2	3	4
Nervous	0	1	2	3	4
Miserable	0	1	2	3	4

PLEASE CONTINUE WITH THE ITEMS ON THE NEXT PAGE



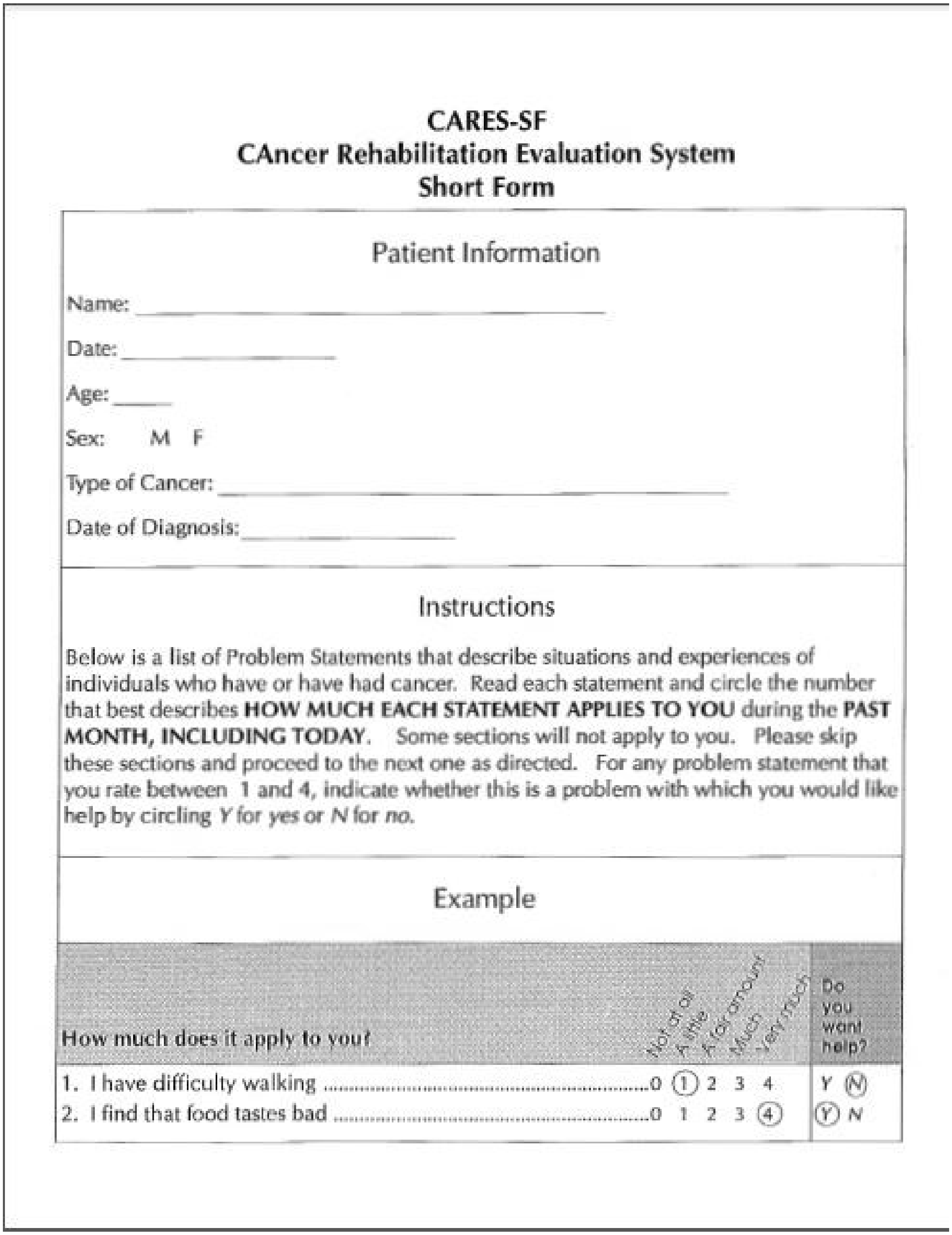
	Not At All	A Little	Moderately	Quite a lot	Extremely
Confident	0	1	2	3	4
Bitter	0	1	2	3	4
Exhausted	0	1	2	3	4
Anxious	0	1	2	3	4
Helpless	0	1	2	3	4
Weary	0	1	2	3	4
Satisfied	0	1	2	3	4
Bewildered	0	1	2	3	4
Furious	0	1	2	3	4
Full of Pep	0	1	2	3	4
Worthless	0	1	2	3	4
Forgetful	0	1	2	3	4
Vigorous	0	1	2	3	4
Uncertain about things	0	1	2	3	4
Bushed	0	1	2	3	4
Embarrassed	0	1	2	3	4

THANK YOU FOR YOUR COOPERATION

PLEASE BE SURE YOU HAVE ANSWERED EVERY ITEM

Citation:
Grove, J.R., & Prapavessis, H. (1992). Preliminary evidence for the reliability and validity of an abbreviated Profile of Mood States. *International Journal of Sport Psychology, 23*, 93-109.

Appendix B-3 Cancer Rehavilitation Evaluation System Short Form (CARE-SF).



CARES-SF
CAncer Rehabilitation Evaluation System
Short Form

Patient Information

Name: ______________________________

Date: ______________

Age: ____

Sex: M F

Type of Cancer: ______________________________

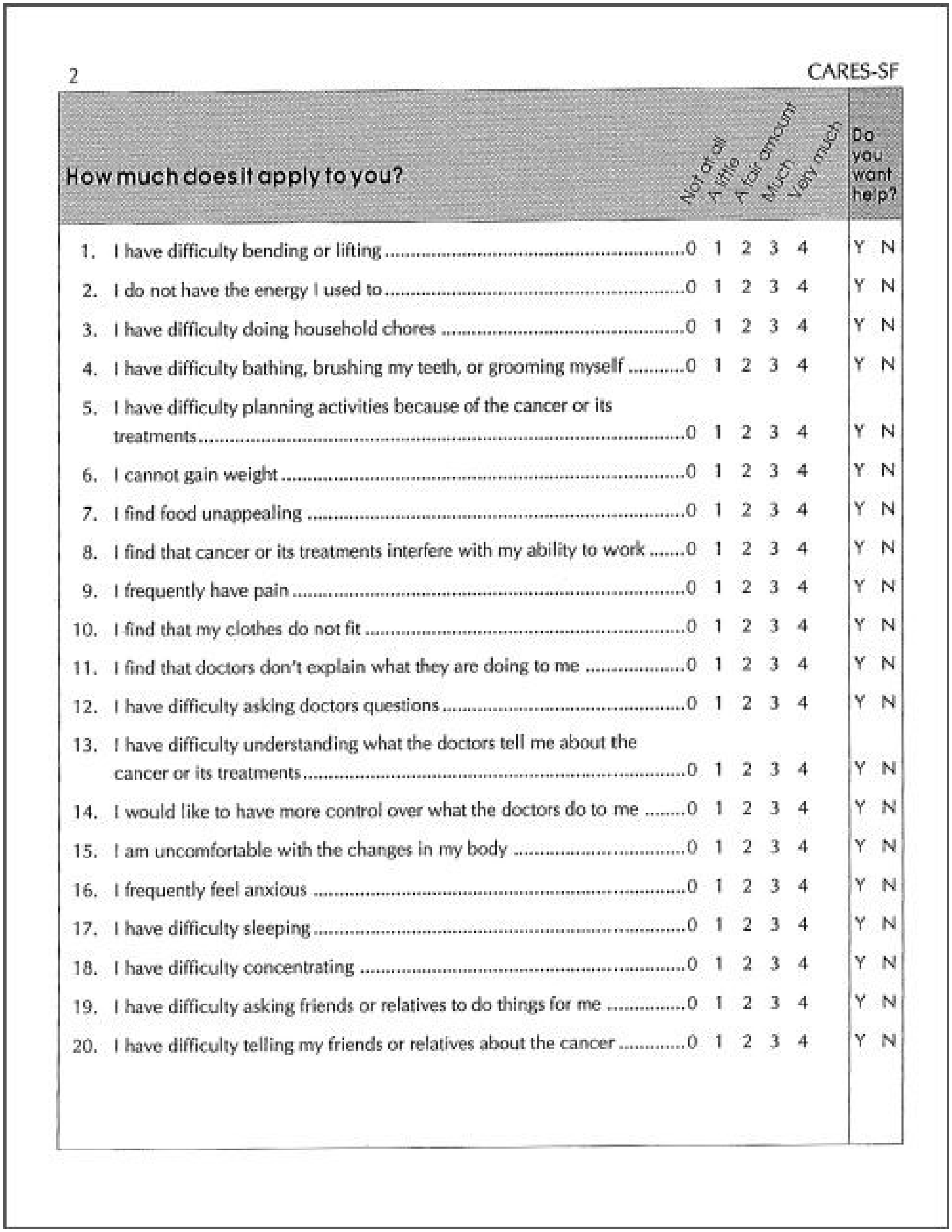
Date of Diagnosis: ______________

Instructions

Below is a list of Problem Statements that describe situations and experiences of individuals who have or have had cancer. Read each statement and circle the number that best describes **HOW MUCH EACH STATEMENT APPLIES TO YOU** during the **PAST MONTH, INCLUDING TODAY**. Some sections will not apply to you. Please skip these sections and proceed to the next one as directed. For any problem statement that you rate between 1 and 4, indicate whether this is a problem with which you would like help by circling *Y* for *yes* or *N* for *no*.

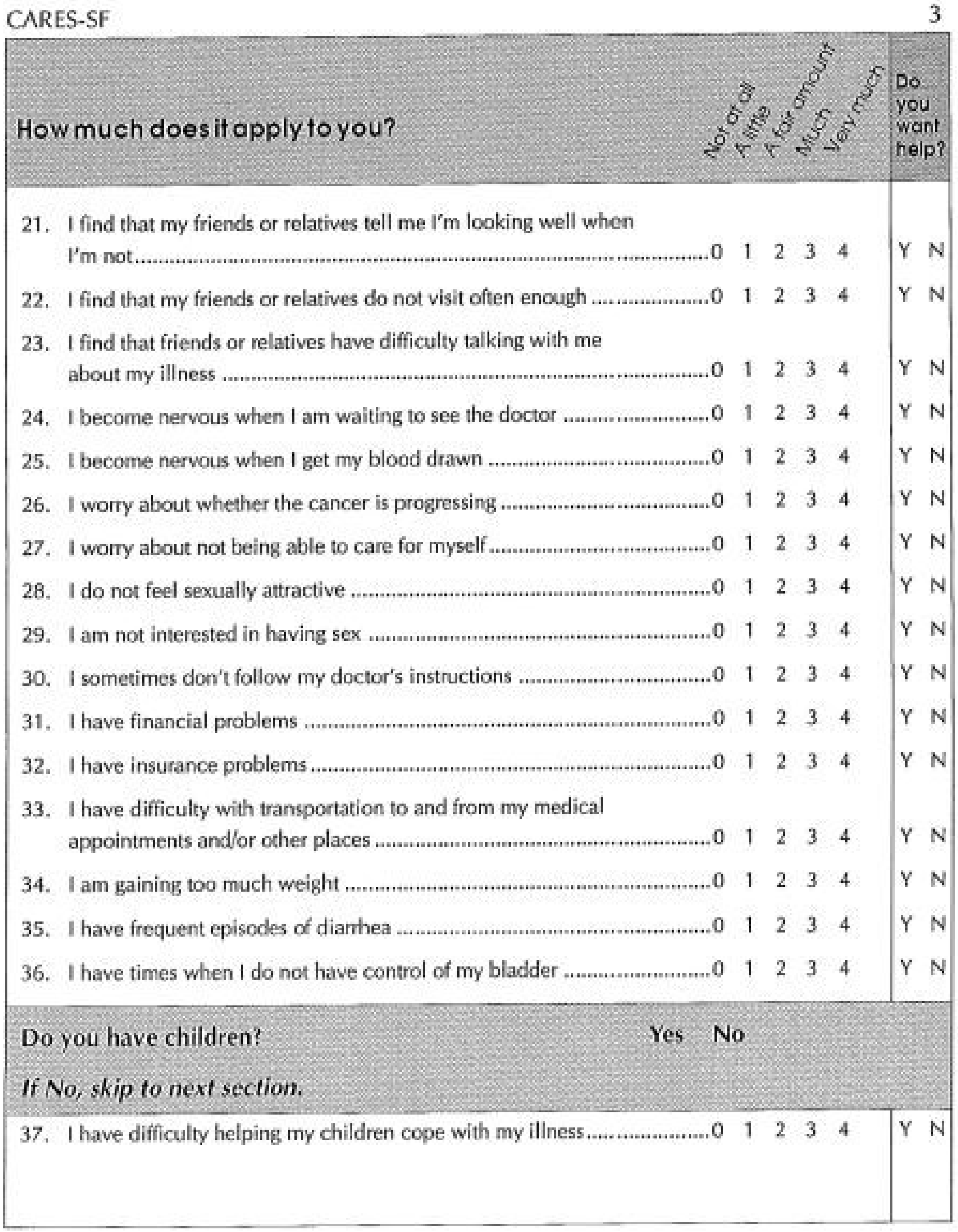
Example

How much does it apply to you?	Not at all	A little	A fair amount	Much	Very much	Do you want help?
1. I have difficulty walking	0	[✓ 1]	2	3	4	*Y* [✓ *N*]
2. I find that food tastes bad	0	1	2	3	[✓ 4]	[✓ *Y*] *N*



2 CARES-SF

	How much does it apply to you?	Not at all	A little	A fair amount	Much	Very much	Do you want help?
1.	I have difficulty bending or lifting	0	1	2	3	4	Y N
2.	I do not have the energy I used to	0	1	2	3	4	Y N
3.	I have difficulty doing household chores	0	1	2	3	4	Y N
4.	I have difficulty bathing, brushing my teeth, or grooming myself	0	1	2	3	4	Y N
5.	I have difficulty planning activities because of the cancer or its treatments	0	1	2	3	4	Y N
6.	I cannot gain weight	0	1	2	3	4	Y N
7.	I find food unappealing	0	1	2	3	4	Y N
8.	I find that cancer or its treatments interfere with my ability to work	0	1	2	3	4	Y N
9.	I frequently have pain	0	1	2	3	4	Y N
10.	I find that my clothes do not fit	0	1	2	3	4	Y N
11.	I find that doctors don't explain what they are doing to me	0	1	2	3	4	Y N
12.	I have difficulty asking doctors questions	0	1	2	3	4	Y N
13.	I have difficulty understanding what the doctors tell me about the cancer or its treatments	0	1	2	3	4	Y N
14.	I would like to have more control over what the doctors do to me	0	1	2	3	4	Y N
15.	I am uncomfortable with the changes in my body	0	1	2	3	4	Y N
16.	I frequently feel anxious	0	1	2	3	4	Y N
17.	I have difficulty sleeping	0	1	2	3	4	Y N
18.	I have difficulty concentrating	0	1	2	3	4	Y N
19.	I have difficulty asking friends or relatives to do things for me	0	1	2	3	4	Y N
20.	I have difficulty telling my friends or relatives about the cancer	0	1	2	3	4	Y N



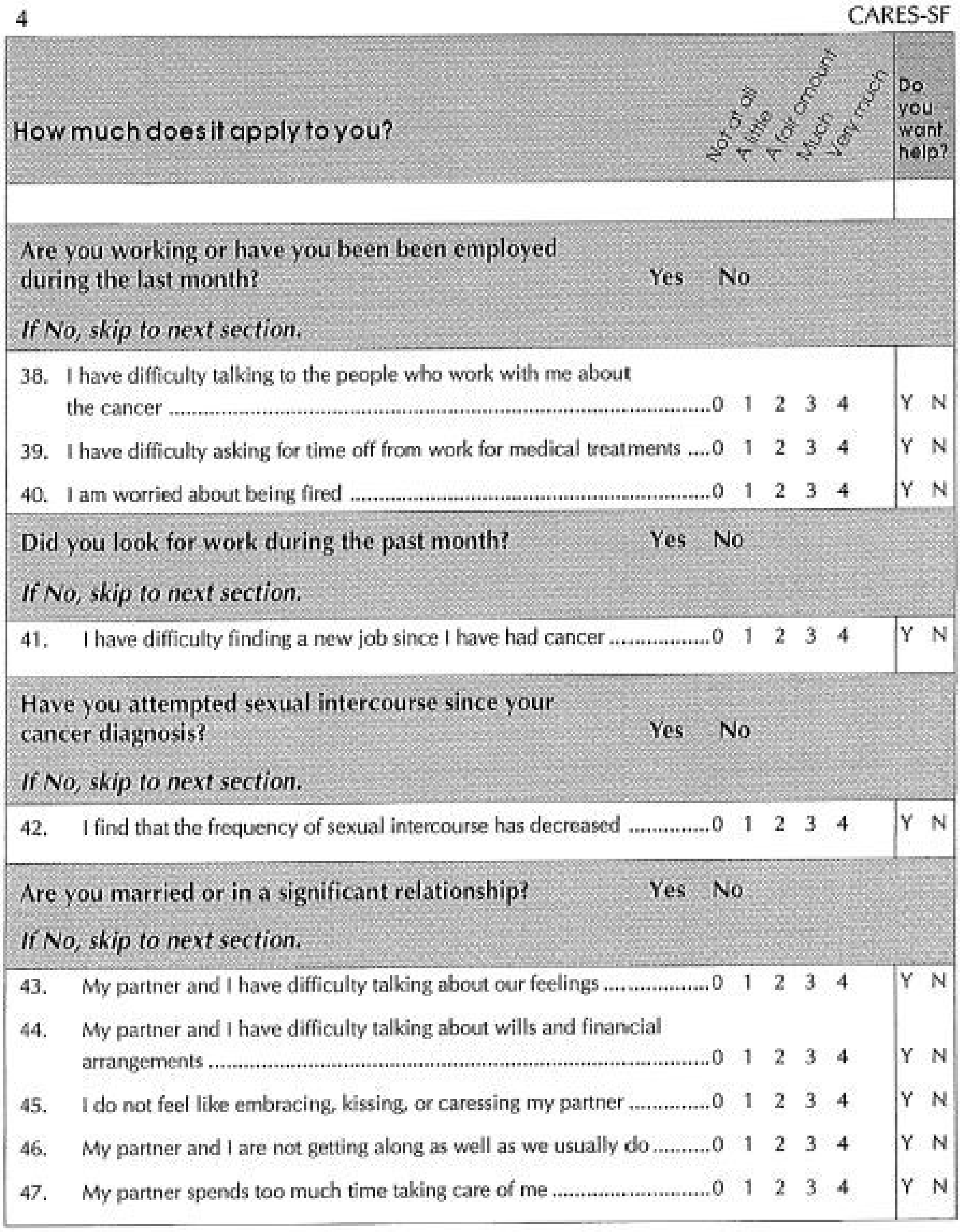
CARES-SF 3

How much does it apply to you?	Not at all	A little	A fair amount	Much	Very much	Do you want help?
21. I find that my friends or relatives tell me I'm looking well when I'm not	0	1	2	3	4	Y N
22. I find that my friends or relatives do not visit often enough	0	1	2	3	4	Y N
23. I find that friends or relatives have difficulty talking with me about my illness	0	1	2	3	4	Y N
24. I become nervous when I am waiting to see the doctor	0	1	2	3	4	Y N
25. I become nervous when I get my blood drawn	0	1	2	3	4	Y N
26. I worry about whether the cancer is progressing	0	1	2	3	4	Y N
27. I worry about not being able to care for myself	0	1	2	3	4	Y N
28. I do not feel sexually attractive	0	1	2	3	4	Y N
29. I am not interested in having sex	0	1	2	3	4	Y N
30. I sometimes don't follow my doctor's instructions	0	1	2	3	4	Y N
31. I have financial problems	0	1	2	3	4	Y N
32. I have insurance problems	0	1	2	3	4	Y N
33. I have difficulty with transportation to and from my medical appointments and/or other places	0	1	2	3	4	Y N
34. I am gaining too much weight	0	1	2	3	4	Y N
35. I have frequent episodes of diarrhea	0	1	2	3	4	Y N
36. I have times when I do not have control of my bladder	0	1	2	3	4	Y N

Do you have children? Yes No

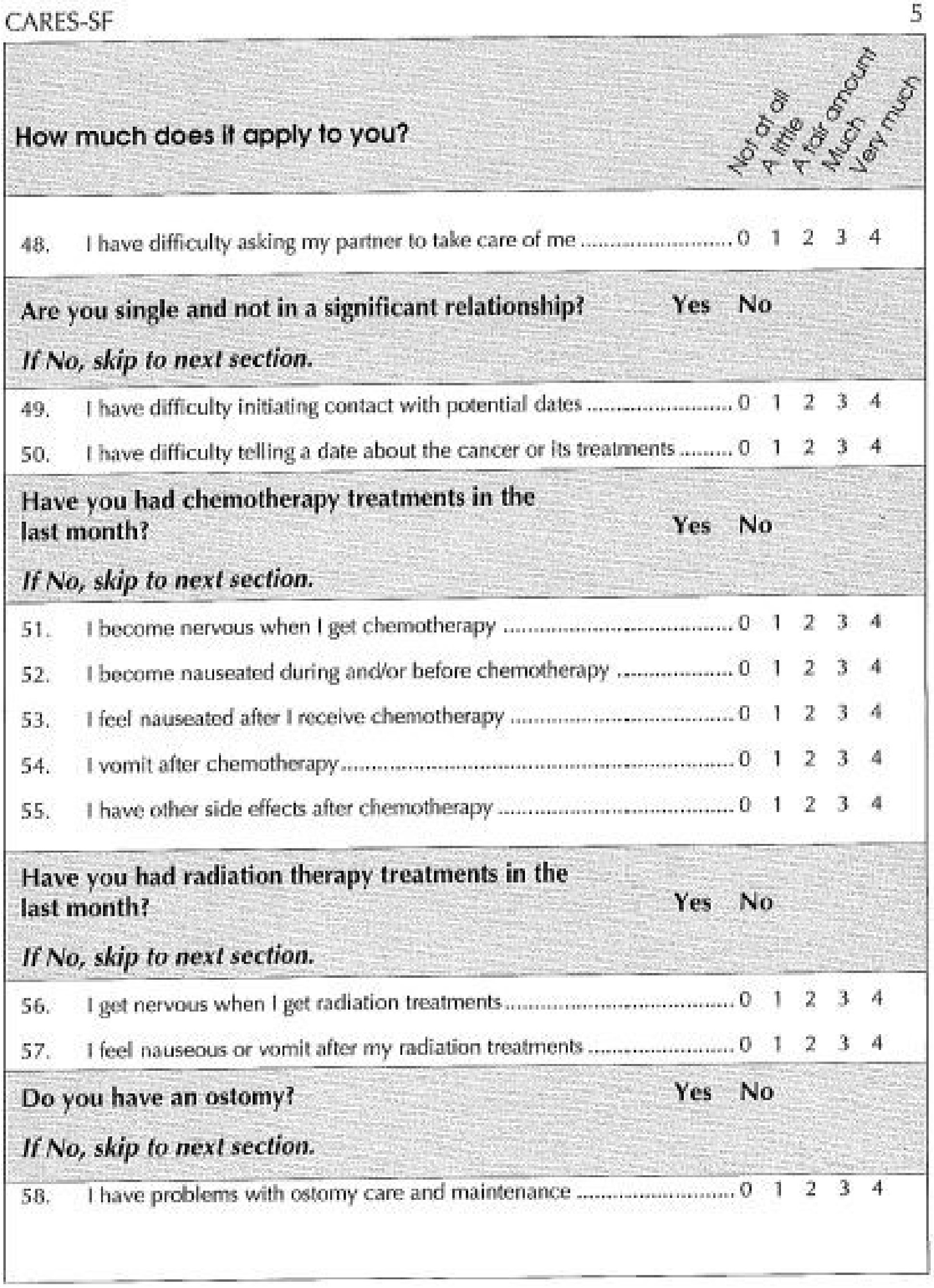
If No, skip to next section.

37. I have difficulty helping my children cope with my illness	0	1	2	3	4	Y N



4 CARES-SF

How much does it apply to you?	Not at all	A little	A fair amount	Much	Very much	Do you want help?
Are you working or have you been been employed during the last month? Yes No *If No, skip to next section.*						
38. I have difficulty talking to the people who work with me about the cancer	0	1	2	3	4	Y N
39. I have difficulty asking for time off from work for medical treatments	0	1	2	3	4	Y N
40. I am worried about being fired	0	1	2	3	4	Y N
Did you look for work during the past month? Yes No *If No, skip to next section.*						
41. I have difficulty finding a new job since I have had cancer	0	1	2	3	4	Y N
Have you attempted sexual intercourse since your cancer diagnosis? Yes No *If No, skip to next section.*						
42. I find that the frequency of sexual intercourse has decreased	0	1	2	3	4	Y N
Are you married or in a significant relationship? Yes No *If No, skip to next section.*						
43. My partner and I have difficulty talking about our feelings	0	1	2	3	4	Y N
44. My partner and I have difficulty talking about wills and financial arrangements	0	1	2	3	4	Y N
45. I do not feel like embracing, kissing, or caressing my partner	0	1	2	3	4	Y N
46. My partner and I are not getting along as well as we usually do	0	1	2	3	4	Y N
47. My partner spends too much time taking care of me	0	1	2	3	4	Y N



CARES-SF 5

How much does it apply to you?		Not at all	A little	A fair amount	Much	Very much
48.	I have difficulty asking my partner to take care of me	0	1	2	3	4

Are you single and not in a significant relationship? **Yes** **No**

If No, skip to next section.

49.	I have difficulty initiating contact with potential dates	0	1	2	3	4
50.	I have difficulty telling a date about the cancer or its treatments	0	1	2	3	4

Have you had chemotherapy treatments in the last month? **Yes** **No**

If No, skip to next section.

51.	I become nervous when I get chemotherapy	0	1	2	3	4
52.	I become nauseated during and/or before chemotherapy	0	1	2	3	4
53.	I feel nauseated after I receive chemotherapy	0	1	2	3	4
54.	I vomit after chemotherapy	0	1	2	3	4
55.	I have other side effects after chemotherapy	0	1	2	3	4

Have you had radiation therapy treatments in the last month? **Yes** **No**

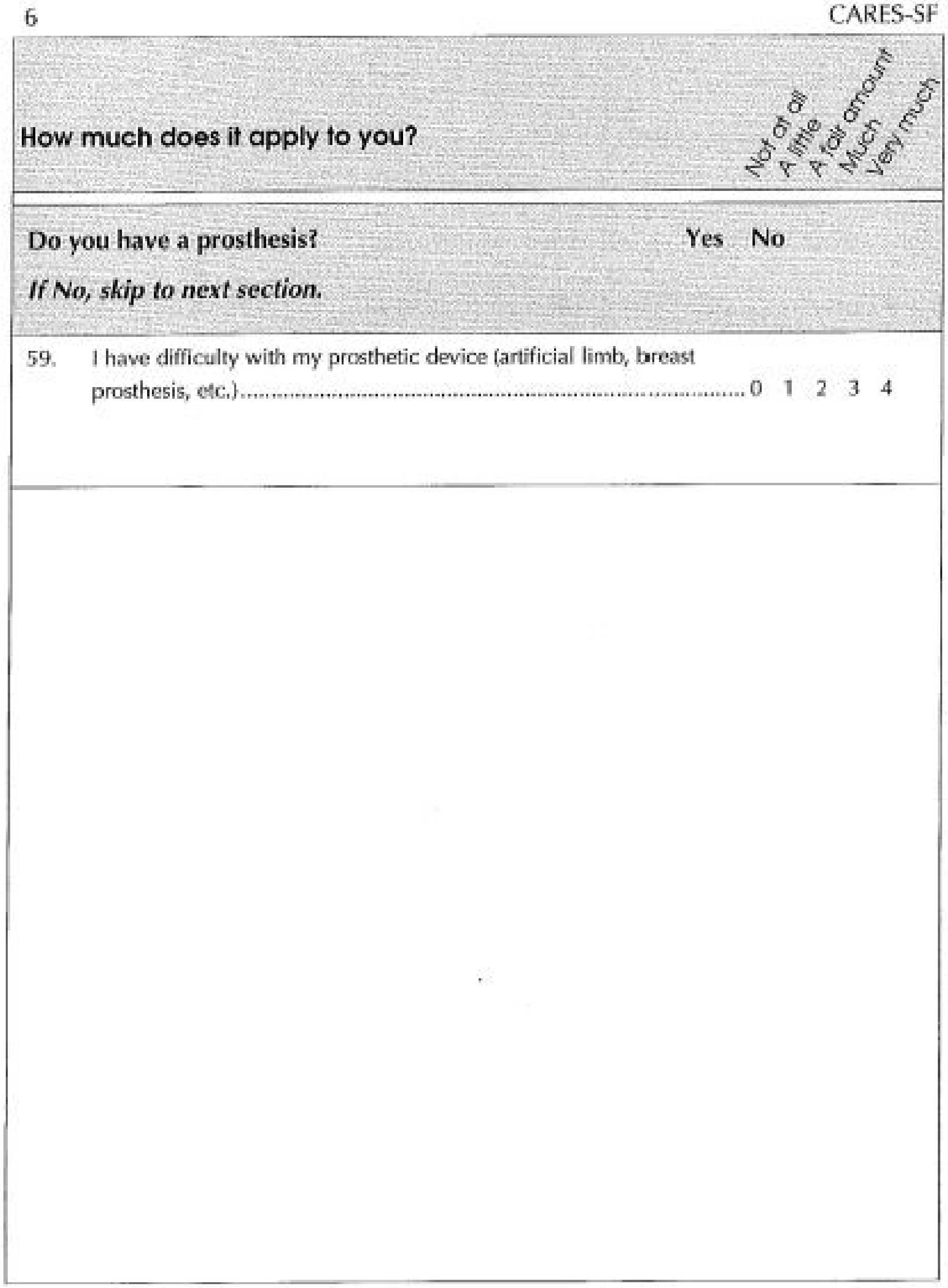
If No, skip to next section.

56.	I get nervous when I get radiation treatments	0	1	2	3	4
57.	I feel nauseous or vomit after my radiation treatments	0	1	2	3	4

Do you have an ostomy? **Yes** **No**

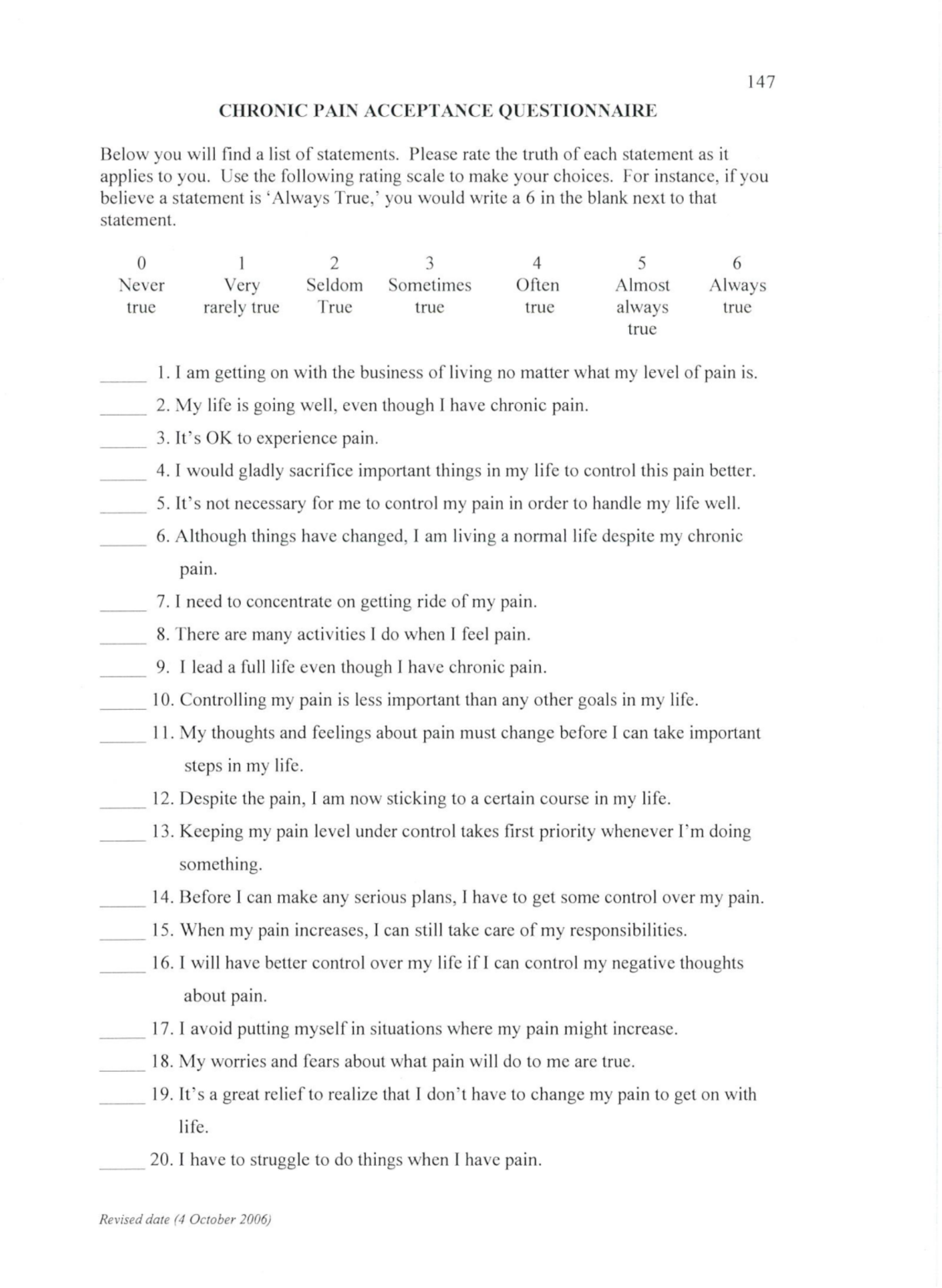
If No, skip to next section.

58.	I have problems with ostomy care and maintenance	0	1	2	3	4



How much does it apply to you?	Not at all	A little	A fair amount	Much	Very much
Do you have a prosthesis? Yes No ***If No, skip to next section.***					
59. I have difficulty with my prosthetic device (artificial limb, breast prosthesis, etc.)	0	1	2	3	4

Appendix B-4 Chronic Pain Acceptance Questionnaire (CPAQ)



CHRONIC PAIN ACCEPTANCE QUESTIONNAIRE

Below you will find a list of statements. Please rate the truth of each statement as it applies to you. Use the following rating scale to make your choices. For instance, if you believe a statement is 'Always True,' you would write a 6 in the blank next to that statement.

0	1	2	3	4	5	6
Never true	Very rarely true	Seldom True	Sometimes true	Often true	Almost always true	Always true

_____ 1. I am getting on with the business of living no matter what my level of pain is.

_____ 2. My life is going well, even though I have chronic pain.

_____ 3. It's OK to experience pain.

_____ 4. I would gladly sacrifice important things in my life to control this pain better.

_____ 5. It's not necessary for me to control my pain in order to handle my life well.

_____ 6. Although things have changed, I am living a normal life despite my chronic pain.

_____ 7. I need to concentrate on getting ride of my pain.

_____ 8. There are many activities I do when I feel pain.

_____ 9. I lead a full life even though I have chronic pain.

_____ 10. Controlling my pain is less important than any other goals in my life.

_____ 11. My thoughts and feelings about pain must change before I can take important steps in my life.

_____ 12. Despite the pain, I am now sticking to a certain course in my life.

_____ 13. Keeping my pain level under control takes first priority whenever I'm doing something.

_____ 14. Before I can make any serious plans, I have to get some control over my pain.

_____ 15. When my pain increases, I can still take care of my responsibilities.

_____ 16. I will have better control over my life if I can control my negative thoughts about pain.

_____ 17. I avoid putting myself in situations where my pain might increase.

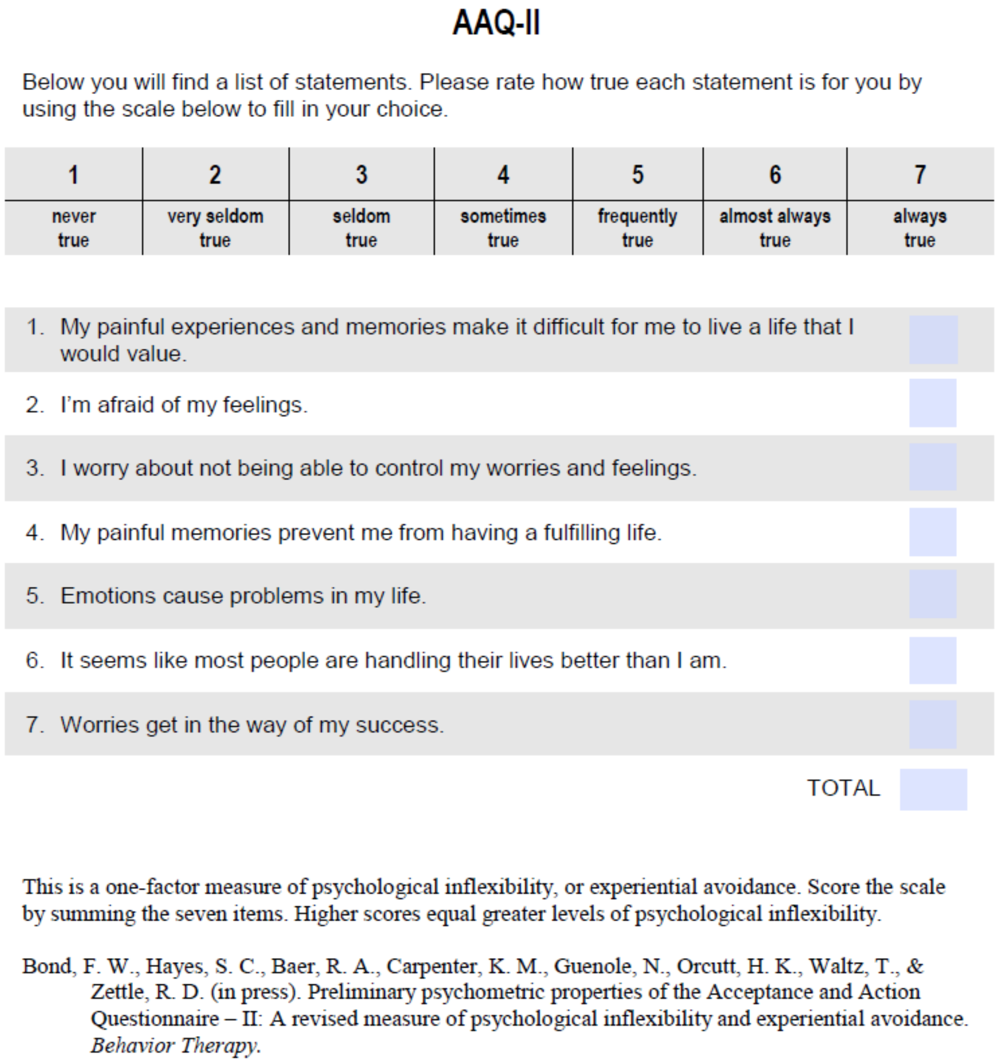
_____ 18. My worries and fears about what pain will do to me are true.

_____ 19. It's a great relief to realize that I don't have to change my pain to get on with life.

_____ 20. I have to struggle to do things when I have pain.

Revised date (4 October 2006)

Appendix B-5 Acceptance & Action Questionnaire-II (AAQ-II)



AAQ-II

Below you will find a list of statements. Please rate how true each statement is for you by using the scale below to fill in your choice.

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true

1. My painful experiences and memories make it difficult for me to live a life that I would value.
2. I'm afraid of my feelings.
3. I worry about not being able to control my worries and feelings.
4. My painful memories prevent me from having a fulfilling life.
5. Emotions cause problems in my life.
6. It seems like most people are handling their lives better than I am.
7. Worries get in the way of my success.

TOTAL

This is a one-factor measure of psychological inflexibility, or experiential avoidance. Score the scale by summing the seven items. Higher scores equal greater levels of psychological inflexibility.

Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., Waltz, T., & Zettle, R. D. (in press). Preliminary psychometric properties of the Acceptance and Action Questionnaire – II: A revised measure of psychological inflexibility and experiential avoidance. *Behavior Therapy*.