The Effect of Yoga Exercise on Improving Depression, Anxiety, and Fatigue in Women With Breast Cancer: A Randomized Controlled Trial

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ABSTRACT

Background: Depression, anxiety, and fatigue are among the most significant problems that influence the quality of life of patients with breast cancer who receive adjuvant chemotherapy. Although evidence has shown yoga to decrease anxiety, depression, and fatigue in patients with cancer, few studies on the effects of yoga have targeted patients with breast cancer. Yoga interventions should be tested to promote the psychological and physical health of women with breast cancer.

Purpose: This study examines the effectiveness of an 8-week yoga exercise program in promoting the psychological and physical health of women with breast cancer undergoing adjuvant chemotherapy in terms of depression, anxiety, and fatigue.

Methods: A sample of 60 women with nonmetastatic breast cancer was recruited. Participants were randomly assigned into either the experimental group (n = 30) or the control group (n = 30). A 60-minute, twice-per-week yoga exercise was implemented for 8 weeks as the intervention for the participants in the experimental group. The control group received standard care only.

Results: Analysis using the Johnson–Neyman procedure found that the yoga exercise reduced overall fatigue and the interference of fatigue in everyday life for the experimental group participants. Significant reductions were obtained after 4 weeks of intervention participation for those experimental group patients with relatively low starting baseline values (baseline item mean value < 3.31 and 3.22, respectively) and after 8 weeks for most patients (approximately 75%) with moderate starting baseline values (baseline item mean value < 7.30 and 5.34, respectively). The 8-week intervention did not significantly improve the levels of depression (F = 1.29, p > .05) or anxiety (F = 2.7, p > .05).

Conclusions/Implications for Practice: The 8-week yoga exercise program developed in this study effectively reduced fatigue in patients with breast cancer but did not reduce depression or anxiety. Oncology nurses should strengthen their clinical health education and apply yoga to reduce the fatigue experienced by patients with breast cancer who undergo adjuvant chemotherapy.

KEY WORDS:
yoga, breast cancer, depression, anxiety, fatigue.

Introduction

Cancer is an important global health issue. New cases of cancer are estimated to reach 21.4 million per annum globally by 2030. Breast cancer is one of the most important diseases affecting women’s health worldwide (World Health Organization, 2011) and an increasingly important cause of cancer and cancer mortality in Taiwan. In 2008, 8,136 of the 34,647 cancer diagnoses in women in Taiwan were breast cancer (Ministry of Health and Welfare, 2013). Surgery is the most prevalent intervention for breast surgery, followed by adjuvant systemic therapy (Smith, 2013). Chemotherapy is the most prevalent method used to treat breast cancer. However, the side effects of this treatment interfere with the body’s metabolism and energy use, which increases tiredness, fatigue, anxiety, depression, and sensitivity to pain; patients also experience diminished alertness during the day. Studies indicate that 40%–100% of women with breast cancer experience depression, anxiety, emotional distress, and fatigue during chemotherapy (Stasi, Abriani, Beccaglia, Terzoli, Karpuz, 2013).

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& Amadori, 2003). Distress is thought to arise because of decreased activity, fatigue, and depression, which in turn may result in feelings of helplessness and even suicidal thoughts. Clinicians tend to underestimate the presence of these symptoms, especially emotional distress factors such as fatigue, anxiety, and depression. Chronic, untreated anxiety, depression, and fatigue may severely affect the quality of life of patients and cause them to lose confidence and hope to the point that they have suicidal thoughts (Harper & Littlewood, 2005). Studies of aerobic exercise interventions performed on cancer populations have shown the effectiveness of exercise in reducing anxiety and depression (Vadiraja et al., 2009; Wen & Fang, 2005). Yoga is a type of body–mind health exercise and has been shown to alleviate the anxiety (Rao et al., 2009), emotional distress (Bower, Woolery, & Garet, 2005; Culos-Reed, Carlson, Daroux, & Hately-Aldous, 2006), and symptom distress (Bower et al., 2005) of patients undergoing chemotherapy. Yoga assists in improving sleep and effectively relieving cancer-related fatigue (Bower et al., 2000, 2012; Cohen, Warneke, Fouladi, Rodriguze, & Choul-Mahowald, 2002). Thus, yoga effectively alleviates the anxiety, depression (Vadiraja et al., 2009), and fatigue (Brown & Gerbard, 2003) that patients with cancer experience during the treatment period and improves quality of life (Carson, Carson, Porter, Keefe, & Seewaldt, 2009; Carson et al., 2007; Culos-Reed et al., 2006; Demark-Wahnefried, 2007; Galantino et al., 2012; Lowe et al., 2012; Zhang, Yang, Tian, & Wang, 2012). Yoga provides significant benefits and can play an important role in the physical and mental healthcare regimens for cancer (Rao et al., 2009).

Yoga intervention enhances mental health and psychological well-being, physical health, behavioral regulation, and interpersonal behavior (Brown, Ryan, & Creswell, 2007; Carson et al., 2007, 2009; Demark-Wahnefried, 2007). Mindfulness intervention research has shown that yoga may concurrently reduce a variety of psychopathological symptoms and enhance mental health and well-being (Brown et al., 2007). The theoretical foundations of meditation and the body–mind connection have been described in this intervention.

The yoga regimen adopted for this study is a safe and manageable yoga program developed by Lisa (2005). Yoga classes are appropriate for patients with breast cancer at all stages of illness. Yoga increases energy, strength, flexibility, and well-being and may facilitate recovery from some of the side effects of cancer treatment. Classes are comprehensive and include breathing practice, yoga postures, awareness exercises, relaxation, stretches, and meditation techniques.

Evidence-based research has shown the positive effects of yoga for cancer populations. However, research exploring the appropriate exercise frequency and exercise preferences of patients with breast cancer is limited. Furthermore, no information regarding the yoga practice preferences of patients with breast cancer is available in the literature.

The goals of the study were to (a) design a yoga exercise program appropriate for women with breast cancer and (b) test the effectiveness of this program in improving the symptoms of anxiety, depression, and fatigue in patients with breast cancer undergoing chemotherapy.

**Methods**

**Study Design**
Sixty (75.9%) of 79 eligible participants consented to participate. Computer-generated numbers were used to randomly assign these participants to the yoga intervention group (n = 30) or the standard care group (n = 30) before the intervention. Randomization used opaque envelopes with group assignments, and personnel who had no involvement in the trial performed randomization. The envelopes were opened sequentially in the order of assignment during recruitment, with the names and registration numbers of the participants written on the covers. Experimental group participants received standard care and maintained an ordinary daily activity routine with daily yoga exercise. Control group participants received standard care and maintained an ordinary daily activity routine. All participants were assessed for anxiety, depression, and fatigue immediately before the intervention and at 4 and 8 weeks after completion of the intervention to identify impact over time.

**Sample Size**
The literature suggests that a mean difference of 3.28 in Profile of Mood States depression subscale scores can be expected between the experimental and control groups after the 7-week yoga intervention, with a pooled standard deviation of 4.7 (Culos-Reed et al., 2006). This study used Statistical Software Sample Power 2.0 and adopted the analysis of covariance (ANCOVA) statistical method based on the research goals. Power was set at 0.8, alpha was .05, and the medium level of covariate’s $R^2$ was .13 (Cohen, 1988). Therefore, the effect size of the covariate adjustment was set to .37. The calculated number of samples for each group was 30.

**Setting and Subjects**
After obtaining approval from the institutional review board, we used purposive sampling to recruit women with breast cancer. All recruited women received chemotherapy between April 2011 and September 2011 at the Chi Mei Medical Center in Tainan, Taiwan. Inclusion criteria for participation included (a) diagnosis of Stages 1–3 of breast cancer; (b) aged between 20 and 70 years with a performance status of 0–2 (ambulatory > 50% of time); (c) clear minded, literate, and able to communicate in both Mandarin and Taiwanese; (d) currently receiving chemotherapy; (e) never performed yoga exercises; (f) no history of a mental disorder; (g) willing to participate in this research; (h) healed open wounds; and (i) at least 1 month since breast cancer surgery. Exclusion criteria included (a) diagnosis of suspected bone metastasis or recurrence; (b) a hemoglobin level of less than 10 mg/dL;
A systematic literature review (Chen, Lin, Lin, & Chang, 2011; Smith & Pukall, 2009) indicates that yoga alleviates symptom distress in patients with breast cancer. For this study, a team of yoga instructors and rehabilitation teachers designed a yoga exercise program appropriate for patients with breast cancer. This 60-minute program included warm-up, Anusara yoga, gentle stretching, and relaxation exercises. The program was implemented as the intervention for experimental group participants at several cancer centers. Experimental group participants further received an introduction to the theoretical foundations of relaxation and “body–mind connectedness.” The program cycled through three segments including (a) 10 minutes of meditation and breathing exercises that focused participant attention on breathing and on internal body sensations; (b) 40 minutes of yoga exercises, laying supine, with legs flexed at the hip and supported by a wall, a series of 10 modified yoga asanas composed of gentle stretching and strengthening exercises targeting specific groups of muscle, tendons, and ligaments; and (c) 10 minutes of cool-down exercises during which the body is in a supine position with legs slightly abducted with the plantar side of the feet placed on the floor, arms slightly abducted, and palms turned upward. This program was provided twice a week for 60 minutes each session during the chemotherapy treatment period over a total of 8 weeks.

To ensure intervention consistency across the study sites and among the instructors, an experienced instructor taught each class using standardized yoga techniques and postures. Instructors recorded all signs and symptoms of participant discomfort that occurred during the yoga sessions.

**Instruments**

**Profile of Mood State**

This scale was established by McNair, Lorr, and Droppleman (1971) and modified by Yang (1996). Subscales assess the depression and anxiety experienced by patients with cancer using 14 items (seven for depression and seven for anxiety) in the form of a 5-point (0–4) Likert scale, with higher values indicating higher depression and anxiety. The Cronbach’s α for this scale was measured as .80, and its content validity was measured as 4.5 (on a 1- to 5-point scale). In this study, the Cronbach’s α was .91–.99 for the depression subscale and .94–.99 for the anxiety subscale over the four measurement times.

**Brief Fatigue Inventory (Taiwan version)**

The Brief Fatigue Inventory (BFI) is a nine-item questionnaire designed by Mendoza et al. (1999) to rapidly assess fatigue severity in clinical settings. Lin et al.’s (2006) Taiwan version of the BFI has been used to assess the fatigue experienced by patients with cancer during chemotherapy treatment. The BFI assesses fatigue-related psychological distress and mood disturbances, fatigue severity, and fatigue impact on daily functions during the most recent 24-hour period. The nine items in the inventory include three addressing severity and six addressing impact. Items are scored on an 11-point (points 0–10) Likert scale, with higher values indicating higher fatigue and greater impact of fatigue on daily life. Internal consistency has been indicated by Cronbach’s αs of .96 for fatigue-related severity and .95 for interference. Test–retest reliability was .89 for fatigue severity and .91 for interference. In this study, the Cronbach’s α was .92–.98 for fatigue severity and .93–.96 for interference over the four measurement times.

**Statistical Analysis**

The SPSS Version 17.0 (SPSS, Inc., Chicago, IL, USA) was used to analyze the data. Descriptive statistics such as mean, standard deviation, range, and frequency distribution were used to describe the participants’ demographic data in each group. A chi-square test (χ² test) or a Fisher’s exact test compared the categorical variables of the two groups. An independent samples t test was conducted to compare the average pretest values of the two groups. A mixed-design, analysis of variance (ANOVA) was used to test whether group and time exhibited significant interaction effects on depression, anxiety, and fatigue. A one-way repeated measures ANOVA was subsequently
performed on variables that exhibited this interaction effect to analyze the simple main effect of different time points in each group. In addition, an independent samples one-way ANCOVA (with the pretest value as covariate) or Johnson–Neyman (J–N) method (Hayes & Matthes, 2009) was used to test the effectiveness of the intervention in improving depression, anxiety, and fatigue.

Results
Baseline Comparisons Between the Two Groups
The average age of participants was $49.27 \pm 10.23$ years. Most were married (44 of 60) and either high school graduates (27 of 60) or university graduates (20 of 60). Both groups were statistically similar in terms of all demographic and medical profile variables ($p < .05$; Table 1). Independent samples $t$ test results identified insignificant differences between the groups in terms of depression, anxiety, fatigue, and the influence of fatigue on daily life (all $ps > .05$).

Interaction Effects Between Time and Group
Results of mixed-design, two-way ANOVA indicated significant interaction effects between time points and groups for fatigue level ($F = 75.49, p < .001$) and the influence of fatigue on patients’ daily lives ($F = 51.71, p < .001$) and no significant interaction effects for depression and anxiety variables (all $ps > .05$). Thus, the results do not support the effectiveness of yoga exercises in reducing depression and anxiety in women who have breast cancer.

Simple Main Effect of Different Time Points in Each Group

Experimental group
Fatigue level and the influence of fatigue on daily life were both lower in the experimental group after the 8-week intervention ($F = 62.95, p < .001$ and $F = 53.53, p < .001$, respectively; Table 2).

Control group
Significant changes in the control group were limited to fatigue level ($F = 25.39, p < .001$) and the influence of fatigue on daily life ($F = 11.09, p < .001$; see Table 3). However, these changes were not positive. Fatigue level was significantly prolonged, and the influence of fatigue on daily life increased (Table 3).

The Effects of the Yoga Exercise Program at Each Time
To assess the impact of the intervention at each follow-up time, this study used a one-way ANCOVA with the pretest measure as the covariate on the assumption that the influences of the pretest measure on the posttest measure were the same between the two groups. When the assumption of homogenous regression coefficients was not validated, the J–N method rather than ANCOVA was used to determine the range of pretest scores associated with a statistically significant effect of intervention.

Fatigue level
At Week 4 of the intervention, differences in regression coefficients within the groups ($F = 23.76, p < .001$) resulted in the J–N procedure showing a significantly stronger benefit in experimental group participants than in control group participants for the category of participants with pretest fatigue scores below 9.92 ($8/60 = 18.3\%$, item mean $< 3.31$, $p < .05$). However, for participants with higher pretest fatigue levels ($24/60 = 40\%; >16.55$, i.e., item mean $> 5.52$), the fatigue of the experimental group was significantly higher ($p < .05$) than that of the control group (Figure 2a).

Thus, at Week 4 of the intervention, the yoga exercise program effectively reduced the fatigue levels only in those participants (18.3%) with lower pretest fatigue and negatively affected participants with higher pretest fatigue. At Week 8 of the intervention, the regression coefficients within the groups differed ($F = 35.83, p < .001$), with the J–N procedure showing that, among participants with pretest fatigue scores below 21.89 ($45/60 = 75\%$, item mean $< 7.30$), the experimental group benefitted significantly more than the control group ($p < .05$), with the remaining 25% showing neither positive effects nor negative effects (Figure 2b). Therefore, the 8-week yoga exercise intervention effectively reduced the fatigue. At 4 weeks after the conclusion of the intervention, the regression coefficients within the groups differed ($F = 32.90, p < .001$). The J–N procedure results indicate a significantly lower score for the experimental group than for the control group at 4 weeks after intervention for those participants with pretest fatigue scores in the range of 2–26 ($p < .05$; Figure 2c). Thus, the fatigue-reduction effect of the yoga exercise intervention persisted in the experimental group 4 weeks after the conclusion of the program.

The influence of fatigue on participants’ daily life
At Week 4 of the intervention, the regression coefficients within the groups differed ($F = 13.15, p < .001$). The J–N procedure showed that, among participants ($23/60 = 38.3\%$) with pretest scores for the influence of fatigue on daily life below 19.34 (item mean $< 3.22$), the experimental group benefitted significantly more than the control group ($p < .05$). Among participants with higher pretest scores for the influence of fatigue on daily life ($12/60 = 20\%; >35.79$, i.e., item mean $> 5.97$), this influence was significantly greater in the experimental group than in the control group ($p < .05$; Figure 3a). At Week 8 of the intervention, the regression coefficients within the groups differed ($F = 9.25, p < .01$). The J–N procedure showed that, among participants with pretest scores for the influence of
fatigue on daily life below 32.05 (46/60 = 76.7%; item mean < 5.34), experimental group participants benefitted significantly more than their control group peers (p < .05). The remaining 23.3% showed neither positive nor negative effects (Figure 3b). At 4 weeks after the conclusion of the intervention, because the regression coefficients within the group were identical (F = 2.14, p > .05), this study used ANCOVA (with the pretest values as the covariate) to test the simple group effect for the influence of fatigue on daily life. The results indicated a significant difference between the two groups in terms of the adjusted mean for the influence of fatigue on daily life (F = 134.72, p < .001). The value for

<table>
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<th>Variable</th>
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<th>p</th>
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<td>18</td>
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<tr>
<td>II</td>
<td>25</td>
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<td>1</td>
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</table>

Note. TAC = taxotere, doxorubicin, and cyclophosphamide; CAF = cyclophosphamide, doxorubicin, and fluorouracil; CMF = cyclophosphamide, methotrex, and fluorouracil; FEC = fluorouracil, epirubicin, and cyclophosphamide.

*aFisher’s exact test.
The experimental group (adjusted mean = 6.25) was significantly lower than that for the control group (adjusted mean = 30.89). In other words, 4 weeks after the conclusion of the yoga exercise intervention, the reduced influence of fatigue on daily life for patients in the experimental group persisted.

**Discussion**

This study clearly shows the feasibility of conducting an established 8-week yoga intervention with women with breast cancer. The high attendance rate further supports that the participants enjoyed the program. The experimental group had a high completion rate (>90%), indicating a high level of commitment and adherence. Results indicate that fatigue and the influence of fatigue on the daily life of the participants in the experimental group had significantly improved after the yoga intervention and that the improvements at the 8-week point in the intervention were maintained through 4 weeks after the conclusion of the intervention. According to Chen et al. (2011), yoga interventions must be performed for at least 8 weeks to achieve significant improvements in fatigue and the influence of fatigue on daily life. The improved fatigue and the influence of fatigue on daily life were congruent with previous studies done by Blank, Kittel, and Haberman (2005) and Carson et al. (2009). Similar to the current findings, Moadel et al. (2007) revealed the existence of an overall significant difference in fatigue after practicing a yoga exercise program, supporting the effectiveness of the yoga exercise program in improving the fatigue outcomes. Although exercise in general has been shown to reduce fatigue in patients with cancer, the yoga exercise program is specifically designed to strengthen specific groups of muscles, tendons, and ligaments of particular benefit to patients with breast cancer. Through the progression of a sequence of static physical postures, yoga uses stretching to improve muscular strength, which may be the possible reason for the reduced fatigue and influence of fatigue on daily life. Alternatively, the lack of effect may also result in a wide range of scores on the outcome measures pretest, indicating the effect of the interventions as contingent on pretest status. Those patients who showed higher levels of fatigue and the influence of fatigue on daily life at the beginning of the study did not show significant improvements in these measures in the 4-week test. The yoga exercise program had effectively reduced the fatigue and the influence of fatigue on daily life in participants with

**TABLE 2.**

Differences Among Pretest, Posttest 1 (Week 4 of the Intervention), Posttest 2 (Week 8 of the Intervention), and Posttest 3 (4 Weeks After the Conclusion of the Intervention) for Variables With Significant Interaction Effects in the Experimental Group (n = 30)

<table>
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<th>Variable</th>
<th>Pretest M</th>
<th>Pretest SD</th>
<th>Posttest 1 M</th>
<th>Posttest 1 SD</th>
<th>Posttest 2 M</th>
<th>Posttest 2 SD</th>
<th>Posttest 3 M</th>
<th>Posttest 3 SD</th>
<th>F</th>
<th>P</th>
<th>Bonferroni Post Hoc Test</th>
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<tr>
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<td>7.1</td>
<td>16.8</td>
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<td>10.9</td>
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<td>Influence of fatigue on daily life</td>
<td>26.2</td>
<td>12.5</td>
<td>21.2</td>
<td>13.8</td>
<td>15.5</td>
<td>13.3</td>
<td>6.6</td>
<td>6.0</td>
<td>53.53</td>
<td>&lt;.001</td>
<td>1 &gt; 2, 2 &gt; 3, 2 &gt; 1, 3 &gt; 1</td>
</tr>
</tbody>
</table>

Note. *Higher score indicated a worse situation.

**TABLE 3.**

Differences Among Pretest, Posttest 1 (Week 4 of the Intervention), Posttest 2 (Week 8 of the Intervention), and Posttest 3 (4 Weeks After the Conclusion of the Intervention) for Variables With Significant Interaction Effects in the Control Group (n = 30)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pretest M</th>
<th>Pretest SD</th>
<th>Posttest 1 M</th>
<th>Posttest 1 SD</th>
<th>Posttest 2 M</th>
<th>Posttest 2 SD</th>
<th>Posttest 3 M</th>
<th>Posttest 3 SD</th>
<th>F</th>
<th>P</th>
<th>Bonferroni Post Hoc Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatigue levels</td>
<td>15.4</td>
<td>7.0</td>
<td>14.9</td>
<td>4.4</td>
<td>20.4</td>
<td>5.0</td>
<td>25.1</td>
<td>3.6</td>
<td>25.39</td>
<td>&lt;.001</td>
<td>2 &gt; 1, 3 &gt; 1, 3 &gt; 2</td>
</tr>
<tr>
<td>Influence of fatigue on daily life</td>
<td>21.3</td>
<td>11.3</td>
<td>20.7</td>
<td>9.7</td>
<td>25.1</td>
<td>9.1</td>
<td>30.5</td>
<td>9.8</td>
<td>11.09</td>
<td>&lt;.001</td>
<td>2 &gt; 1, 3 &gt; 1, 3 &gt; 2</td>
</tr>
</tbody>
</table>

Note. *Higher score indicated a worse situation.
lower pretest values for fatigue (<9.92) and the influence of fatigue on daily life (<19.34) at Week 4 and participants with moderate pretest values for fatigue (<21.89) and the influence of fatigue on daily life (<32.05) at Week 8. On the other hand, patients with higher pretest values for fatigue and the influence of fatigue on daily life experienced the opposite effects at Week 4 of the intervention. Therefore, our study suggests that higher pretest values for fatigue (≥16.55) and the influence of fatigue on daily life (≥35.79) pose a barrier to adherence and that these participants need a longer time (8 weeks rather than 4 weeks) to validate the effect of the intervention. On the basis of the results of the J-N method, study findings provide evidence for better clinic practice in patients with breast cancer. The yoga exercise showed a significant and positive effect on improving fatigue through the 8-week intervention in this study. Those patients with initially high levels of fatigue and the influence of fatigue on daily life experienced could not be expected to show improvements on fatigue measures after 4 weeks of the intervention. However, there were no statistically significant group differences for the measures of depression and anxiety in patients with breast cancer, which is consistent with previous studies (Zhang et al., 2012). Rao et al. (2009) designed an intervention that included mindfulness meditation, yoga stretches, group support, and home exercises. Similar to the current findings, Banerjee et al. (2007) found that participants in the intervention group experienced decreased depression and anxiety. However, it is not clear whether the benefits were due specifically to yoga. It is noteworthy that the form of yoga used in the current study was presented and taught in its traditional format, which
includes a number of components (Cohen et al., 2004). However, it is unlikely to be the only therapeutic element of the intervention, as 57% of participants reported practicing yoga at home once per week or more. Thus, although the yoga program designed for this study appears to be useful for this population, there is no way to identify those aspects of the program that have more or less impact. Program evaluation ratings reflect the importance of the social support benefits of the intervention, which was underscored by the relative disinclination toward home practice.

There are several possible explanations for why this study failed to find an effect of yoga on the measures of depression and anxiety. The current study was also not able to discern the therapeutic factors operating in yoga, such as social support, physical poses, or meditation. In addition, the means of depression and anxiety at baseline were 16.40 (scoring indicator = 58.57%) and 17.57 (scoring indicator = 62.75%), respectively. The scores for depression and anxiety at baseline were low. Therefore, there was not much room for improvement, which may be the reason for the unexpected nonsignificant findings for depression and anxiety. Overall, significant improvements were seen in patients participating in yoga exercise on measures of fatigue. On the basis of their meta-analysis, Zhang et al. indicated that yoga had no significant effect on fatigue. However, results of the yoga studies have methodological limitations, including type of yoga, small sample sizes, intervention periods, and inadequate statistical analyses (Chen et al., 2011; Smith & Pukall, 2009; Zhang et al., 2012). In the future, inclusion of appropriate comparison support groups may help tease apart the unique impact of each factor.

**Limitations**

Although considerable efforts were made to design this study and significant outcomes were found, there were limitations in terms of clinical practice. First, this study did not apply an ideal double-blind approach. Participants in the experimental group were aware that they were receiving the yoga intervention, which may have led most participants to provide answers that were more positive than actually justified and may have resulted in a significant Hawthorne effect. In addition, the restricted number of variables prevented the integration and analysis of the influence of participant adaptive abilities and attitudes on fatigue level. We suggest that the influence of these variables on fatigue levels be further investigated and objectively included in future research measurements.

**Conclusions**

Results indicate positive outcomes in applying a yoga exercise to a sample of women with breast cancer undergoing chemotherapy. Little previous research has examined the format of yoga used in women with breast cancer undergoing chemotherapy. Therefore, this study provides insight on intervention effectiveness. Among approximately 75% of participants with lower pretest values for fatigue and influence of fatigue on daily life, the 8-week yoga exercise appeared to reduce fatigue and the influence of fatigue on daily life. A further aim of the study was to adjust the yoga exercise program to ensure it is suitable for all patients with breast cancer and to develop programs for general use by patients with cancer. However, the developed 8-week yoga exercise program did not reduce the levels of depression and anxiety of participants. By discussing with patients how to select the appropriate type of yoga, including mindfulness meditation, yoga stretches, group support, and home exercises, yoga may be better integrated into cancer care. This may help increase the professional autonomy of nurses and enhance the quality and uniqueness of clinical care. However, the results recommended that the format of specific yoga programs should be developed in consultation with other experts, including rehabilitation experts and yoga instructors, and adjusted based on cancer type to develop appropriate and safe yoga exercises while reducing the risk of negative events. Future research should conduct longer follow-up studies to provide a reference for application in clinical nursing as well as to investigate the influence on fatigue level of patients’ adaptation ability and attitudes. The results of the study assist clinical healthcare workers to understand the hidden benefits of yoga and may serve as evidence for making effective clinical care decisions.

**References**


瑜珈運動對乳癌病人憂鬱、焦慮及疲憊改善之成效：
隨機控制試驗

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背景
憂鬱、焦慮及疲憊是乳癌病人於化療治療期間最困擾的症狀，影響病人之生活品質，
實證顯示瑜珈可緩解癌症病人的焦慮、憂鬱及疲憊。然而，鮮少有關瑜珈於乳癌族群
之成效研究。因此，應該測試瑜珈的介入措施以提昇乳癌婦女的身心健康。

目的
測試8週瑜珈運動對化療治療期間乳癌婦女身心健康，特別是憂鬱、焦慮及疲憊之
成效。

方法
收案未轉移乳癌病人共60位，隨機分派至實驗組（30位）與對照組（30位）。實驗組接
受每週2次，每次60分鐘，共計8週瑜珈介入措施，對照組接受常規照護。

結果
詹森內曼程序的分析顯示，瑜珈介入滿4週，對於前測值較小（疲憊程度前測值平均
< 3.31，疲憊影響日常生活程度前測值平均 < 3.22）的病人有降低疲憊和疲憊影
響日常生活程度之效果。介入滿8週，則對於具適當前測值（疲憊程度前測值平均
< 7.30，及疲憊影響日常生活程度前測值平均 < 5.34）的更多病人（約佔75%）有降
低疲憊和疲憊影響日常生活程度之效果。然，8週的瑜珈介入無法顯著的改善參與者
的憂鬱（F = 1.29, p > .05）及焦慮（F = 2.7, p > .05）。

結論／
本研究所發展的8週瑜珈運動計畫，可有效的降低乳癌病人之疲憊，但未能有效的降低
憂鬱及焦慮。腫瘤護理人員可強化臨床衛生教育，應用瑜珈協助改善乳癌病人於化學
治療期間之疲憊。

實務應用

關鍵詞：瑜珈、乳癌、憂鬱、焦慮、疲憊。

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