



# The effect of the preoperational psychoeducation program for Taiwanese breast cancer patients: A three-month follow-up study

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## ABSTRACT

**Objective:** Studies suggest that psychosocial interventions might be more effective during highly stressful periods, such as before surgery. This study aimed to explore the effectiveness of the Preoperational Health Psychology Education program among Taiwanese breast cancer patients.

**Methods:** A total of 137 adult women (1) diagnosed with breast cancer; and (2) admitted to the ward for surgery were recruited to join the program one day before surgery. Emotional distress, worries, and cancer self-efficacy were evaluated at admission, post-program, and 3-month post-surgery. Patients were grouped into high/low distress groups, and mixed-design ANOVA was used to examine the program's effectiveness.

**Results:** The results showed significant interactions of Group  $\times$  Time in emotional distress ( $F = 16.15, p = .000$ ) and worry ( $F = 5.81, p = .005$ ), but not in self-efficacy ( $F = 2.97, p = .068$ ). The post-hoc tests revealed significant decreases in emotional distress and worry in the high distress group.

**Conclusion:** The program was found helpful in reducing emotional distress and worries. The effect lasting for three-month for those with higher preoperational emotional distresses.

**Innovation:** This psycho-education program with a relatively rare one-session design, targeted at a less-studied pre-surgery period, is helpful to a less-studied population, Asian cancer patients.

## 1. Introduction

Psychological issues are prevalent among cancer patients. Many review studies have shown that cancer patients are prone to anxiety and depression [1,2], and breast cancer patients are no exception. In addition to physical symptoms, they also face psychological and social problems [3,4], some even lasting for years after cancer treatments [5,6]. To help patients cope with cancer, many psychosocial intervention methods have been developed and generally have been found useful [7,8]. As for breast cancer patients, the results of a meta-analysis showed that these interventions help address sleeping problems, anxiety, depression, emotional distress, and quality of life [8].

However, later reviews found that if we looked into these studies with more rigorous standards (e.g., studies with a randomized controlled trial), there was insufficient evidence to prove that psychosocial interventions are beneficial for cancer patients [9,10]. Nevertheless, Garssen and colleagues argued that psychosocial intervention should be beneficial. The lack of evidence might be due to most psychosocial interventions were after the surgery, which is less stressful. They suggested that it might be

more effective if the psychosocial intervention were conducted during a more stressful period, such as before surgery [11]. The “pre-habilitation” concept proposed by Silver and Baima also emphasizes that the timing of interventions might be critical [12]. They advised the medical system to care for patients not only physically but also psychologically during the time from diagnosis to the start of acute treatment (i.e., surgery).

The number of studies focusing on preoperational psychological interventions has increased, although still insufficient. A review study found support from seven eligible studies that these preoperational psychological interventions have positive impacts on the patients' somatic symptoms, psychological outcomes, and quality of life [13]. Most of these intervention programs, similar to many post-treatment programs, employ the stress management framework, which mainly includes relaxation training, problem-solving, coping strategies, and guided imagery. For instance, Cohen and colleagues developed a stress-management intervention consisted of two 60- to 90-minute individual sessions 2 weeks before surgery with a clinical psychologist and focused on relaxation training and guided imagery. They found that stress-management intervention could help increase immune parameters 48-h after surgery [14]. Garssen and

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colleagues designed stress-management training comprised of meditative exercise, guided imagery, active coping, and relaxation training in four 45–60 min sessions from 5 days pre-surgery to 1-month post-surgery. Results showed that the intervention group had significantly lower depression and fatigue at day-5 post-surgery and fewer surgery-related symptoms 3-month post-surgery than the control group [11]. Although with these encouraging findings, most pre-treatment psychological intervention studies for cancer patients have been conducted considering Western culture. To our knowledge, few have focused on Asian culture and population. Considering Taiwan's clinical reality, pre-treatment psychoeducation appears to be an equitable solution for enhancing comprehensive cancer care quality.

Therefore, the current study explored the effectiveness of stress management via preoperational psychoeducation among Taiwanese patients with breast cancer. The participants attended the Preoperational Health Psychology Education program one day before surgery. Emotional distress, worry, and self-efficacy were measured by self-report before and after the program, and at three-month follow-up session to evaluate the program's effectiveness.

## 2. Methods

### 2.1. The preoperational health psychology education program

The Preoperational Health Psychology Education program is based on the stress-management concept, adjusting to the Taiwanese culture [15]. The program is designed by licensed clinical psychologists (the authors) who had many experiences working with cancer patients. The program had been pilot with two small groups of breast cancer patients and modified by their feedbacks (e.g., word selections, length of the film). The final program first invited participants to watch a 14+ minute video and then join a group discussion led by a clinical psychologist. The video comprises three parts: stress awareness, stress management, and autogenic relaxation training.

1. **Stress awareness:** In this part, stress is defined and how stress affects people directly and indirectly is discussed. For instance, the direct effect of stress might be via activation of the autonomic nervous system, which signals the hypothalamic–pituitary–adrenal axis to release hormones (e.g., adrenalin and cortisol) to cope with the stressful situation. However, if the stress is prolonged, the continued release of these hormones may decrease one's immune function. Meanwhile, stress might indirectly affect one's health by promoting an unhealthy lifestyle, such as smoking, drinking, and keeping a very tight schedule, which would cause harmful health effects.
2. **Stress management:** For a better understanding of stress management, this concept is introduced to the participants by discussing three categories: physical, emotional, and cognitive. Regarding physical self-care, the interaction of eating, sleeping, and energy is clarified, with emphasis on the importance of being flexible about adjusting one's daily life. For the emotional part, the surviving/evolutionary function of negative emotions is explained, as well as why it is reasonable to feel bad when stress is encountered. The participants are encouraged to explore, express, and accept their feelings. For the cognitive part, the participants are enlightened as to how negative thoughts emerge quickly after stress, with emphasis on the possibility and benefits of thinking more constructively and positively. After introducing these three parts, the participants are encouraged to monitor their condition and choose the best ways to adjust to stress.
3. **Autogenic relaxation training:** Autogenic relaxation is a method to reduce psychological and physical tension via self-suggestion (e.g., regulate breathing). The program introduces the principle underlying autogenic relaxation (i.e., the autonomic nervous system), and then the participants are invited to practice the autogenic relaxation by following the instructions in the video.

### 2.2. Participants and procedure

The study was conducted at the breast surgeon ward of a medical center in northern Taiwan. The institutional review board of the hospital approved the current research (IRB No. 201707044RINC). As a clinical routine of the hospital, patients are admitted to the ward one day before surgery. The patients were selected as candidates for this study based on the following inclusion criteria: (1) adults (20 years old or above); (2) diagnosed with breast cancer; and (3) admitted to the ward for any of the following surgery: total mastectomy, partial mastectomy, axillary lymph node dissection, or sentinel lymph node dissection. Patients with any vision, hearing, or receptive language disturbances were excluded, owing to the design of the psychoeducational program. All candidates completed a routine psychological assessment at admission (time0) and were invited to the Preoperational Health Psychology Education program and this follow-up study. Patients who agreed to participate in the study were asked to complete a post-psychoeducation program psychological assessment (time1) and a follow-up psychological assessment at their routine three-month post-surgery outpatient clinic follow-up (time2). All participants signed a written informed consent after the procedures of the study were explained in detail.

### 2.3. Measurements

The participants received a psychological assessment at admission (Time0), immediately after the psychoeducation program (Time1), and three months after surgery (Time2). The measurements consisted of three parts: a distress thermometer, a worry scale, and a self-efficacy scale, described as follows.

1. **Distress Thermometer (DT):** The DT is the screening tool recommended by the National Comprehensive Cancer Network (NCCN) for measuring distress among cancer patients [16]. The DT is a single-item measurement that asks the question “please circle the number (0–10) that best describes how much distress you have been experiencing in the past week, including today,” in which 0 stands for “no distress” and 10 for “extreme distress.” Subsequent research suggests that adding more domains can improve the accuracy of DT [17]. Thus, this study used a four-item version of the DT (i.e., distress, fear, anger, and depression) on a 0 to 10 Likert scale to evaluate distress among cancer patients.
2. **The Preoperational Cancer Worry Scale (PSCWS):** To assess the concerns of cancer patients before surgery, we developed the PSCWS for this study. Most of the questionnaires were designed to evaluate “worry” among cancer patients after surgery or treatment; thus, some of the items were not appropriate prior to the surgery. In Taiwanese culture, it is considered rude, offensive, insulting, and even a jinx to ask whether patients are worried about recurrence, treatment problems, and death before the primary treatment has started. Therefore, we developed a PSCWS that covers many life aspects of cancer patients but avoids some topics (i.e., recurrence) that are often considered as rude or inappropriate. The instruction is, “To understand your recent worries, please carefully read the following items and answers how worried have you been during the past week about it.” A total of 12 PSCWS items were created based on clinical experience (e.g., what patients report) and by reviewing other established measures (e.g., Cancer Worry Inventory [18]), including autonomy, pain, looks, stigma, social role, daily life, finance, and cancer per se. For example, (how worried are you about) “losing control of your body,” “being a burden to your families,” “the pain that your illness or treatment might cause,” “cannot fulfill your social role at home or work.” Patients were asked to answer the question on a six-point Likert scale, where “0” indicates “not worried at all” and “5,” “extremely worried.” Reliability of the PSCWS was high; the internal consistency coefficient (Cronbach's alpha) of the current study was 0.92.
3. **The Cancer Behavior Inventory-Brief Version (CBI-B):** The CBI-B is a 12-item scale designed to measure self-efficacy while facing cancer. The

CBI-B scale has excellent reliability (Cronbach's alpha ranged from 0.84 to 0.88) and validity [19]. The CBI-B used in this study asked patients the question “how confident have you been during the past week when dealing with the following matters” on a seven-point Likert scale, where “0” indicates “not at all confident,” and “5,” “totally confident.”

2.4. Statistical analysis

The mean scores were used for all the variables in the analyses. The DT score was the average score of all four domains; the “worry” score was the average score of all 12 items in the PSCWS; and the “self-efficacy” score was the average score of all 12 items in the CBI-B. To examine whether “emotional distress” moderates the effect of the psychoeducational program, we followed the NCCN's suggestion 15 to classify all participants into the high DT (DT ≥ 4) and low DT (DT < 4) groups based on the baseline score. Mixed-design analysis of variance (ANOVAs) were used to examine differences between the high and low DT groups (between-group), and changes from baseline (time0) to post-program (time1), and to the three-month follow-up session (time2). All data were analyzed using IBM SPSS Statistics version 21(IBM Corp., Armonk, NY, USA).

3. Results

A total of 137 women (mean age: 57.16 ± 12.32 years) diagnosed with breast cancer attended the Preoperational Health Psychology Education program, with 71 (51.8%) participants assigned to the high DT group and 66 (48.2%), to the low DT group (Table 1). There were no significant differences between participants in the high/low DT groups in terms of age ( $t = 0.51, p = .612$ ), tumor stage ( $\chi^2 = 7.24, p = .065$ ), and those who underwent chemotherapy or not ( $\chi^2 = 0.54, p = .464$ ).

3.1. Recency effect of the program

To examine the effectiveness of the program, we first tested the recency effect of the program by analyzing the data from time 0 (at admission) to time1 (immediate post-program). All 137 participants were included in the analysis. The results of the ANOVA (Table 2) showed that the interaction of group and time was significant in the DT scores ( $p = .000$ ), but not in the worry ( $p = .672$ ) or self-efficacy ( $p = .876$ ) scores. The post-hoc tests revealed a significant drop in DT scores between time0 and time1 for both the high ( $p = .000$ ) and low DT groups ( $p = .013$ ). The results also confirmed that the DT scores were significantly higher in the high DT group than in the low DT group at both time0 ( $p = .000$ ) and time1 ( $p = .000$ ). The main effects in “group” and in “time” were significant on both worry and self-efficacy scores. For “group,” the high DT group had a higher worry score ( $p = .000$ ) and lower self-efficacy score ( $p = .000$ ) than the low DT group. For “time,” a significant decrease in worry score ( $p = .000$ ) and an increase in self-efficacy score ( $p = .000$ ) were found.

Table 1 Demographic and medical statistics of Low/High DT participants.

		DT Group				$\chi^2$	<i>p</i>
		Low ( <i>n</i> = 66)		High ( <i>n</i> = 71)			
		N	%	N	%		
Stage	0	11	57.9	8	42.1	7.24	0.065
	I	27	38.6	43	61.4		
	II	17	68.0	8	32.0		
	III-IV	11	47.8	12	52.2		
Chemical Therapy	No	32	51.6	30	48.4	0.54	0.464
	Yes	34	45.3	41	54.7		
	Mean		SD	Mean	SD	<i>t</i>	<i>p</i>
Age		56.73	12.13	57.83	12.69	0.51	0.612

Note. DT: Distress Thermometer.

3.2. Program effect at 3-month post-surgery

Second, we tested the effect of the program three months after the surgery by analyzing the data from time0, time1, and time2. Of these, 83 (60.6%) patients completed the three-month follow-up session. To examine if there were systematic differences in those who failed to complete the follow-up session, sensitivity tests were performed. The results showed no significant differences between those who did or did not complete the follow-up session in the distributions of high/low DT groups ( $\chi^2 = 3.08, p = .079$ ), tumor stage ( $\chi^2 = 5.22, p = .157$ ), those who underwent chemotherapy or not ( $\chi^2 = 0.24, p = .878$ ), and all variables at time0 and time1 (Supplementary Table 1). Of the 83 participants included in the analysis, 38 (45.8%) were in the high DT group, and 45 (54.2%) were in the low DT group. The results of the ANOVA (Table 3) showed that the interaction of group and time was significant in the DT ( $p = .000$ ) and worry ( $p = .005$ ) scores, but not in the self-efficacy scores. The post-hoc tests revealed significant decreases in DT scores from time0 to time1 ( $p = .000$ ), from time0 to time2 ( $p = .000$ ), but not from time1 to time2 ( $p = .943$ ) in the high DT group. However, in the low DT group, the differences in DT scores were insignificant from time0 to time1 ( $p = .529$ ), from time1 to time2 ( $p = .529$ ), and from time0 to time 2 ( $p = .854$ ). The results also confirmed that the DT scores were significantly higher in the high DT group than in the low DT group at time0 ( $p = .000$ ), time1 ( $p = .000$ ), and time2 ( $p = .000$ ). Regarding the worry scores, the post-hoc tests showed significant decreases between time0 and time1 ( $p = .000$ ), time0 and time2 ( $p = .000$ ), but not between time1 and time2 ( $p = .302$ ) in the high DT group. However, the differences in worry scores were only significant between time0 and time1 ( $p = .000$ ), but not from time1 to time2 ( $p = .135$ ), nor time0 to time2 ( $p = .142$ ) in the low DT group. The results also showed that the worry scores were significantly larger in the high DT group than in the low DT group at time0 ( $p = .000$ ), time1 ( $p = .000$ ), and time2 ( $p = .000$ ). As for the self-efficacy scores, only the main effect of “group” was significant; the high DT group had a lower self-efficacy ( $p = .000$ ) than the low DT group.

4. Discussion and conclusion

4.1. Discussion

The results of this study showed that the Preoperational Health Psychology Education program was effective among Taiwanese patients with breast cancer. Regardless of whether the patient reported high (DT ≥ 4) or low (DT < 4) emotional distress at admission, this psycho-educational program was seen to help patients ease distress, calm worries, and gain more self-efficacy before surgery. Furthermore, the effect of this program on emotional distress and worries among patients with higher emotional distress was observed to last for at least three months after surgery. It is encouraging to find that a 40–50 min short psycho-educational program conducted one day before surgery is useful.

Our results support the findings of other preoperational intervention studies on cancer patients. Most of the interventions that applied the concept of stress management with relaxation training have found positive emotional impacts after the session; however, these benefits did not last long. For instance, Parker et al. [20] found that preoperational stress management has a short-term effect on reducing patients' mood disturbance and a long-term effect on physical components, but no significant changes in mental components. Garssen et al. [11] found a significant decrease in depression scores after the intervention, but the effect diminished after 30 days. Some of the studies found trends of potential decreases in negative emotions, but the findings were not statistically significant [21]. Moreover, most of the preoperational interventions have more than one session scheduled; some of them even provide a booster session after the operation [13]. Thus, considering time–cost, labor power, and medical resources, the Preoperational Health Psychology Education program appears to be more efficient.

**Table 2**  
Results of the Mixed-Designed ANOVA from Time0 to Time1 (n = 137).

Variables	DT	Time0		Time1		Group		Time		Group X Time	
	Group	Mean	SD	Mean	SD	F	p	F	p	F	p
Distress	Low	1.90	1.11	1.35	1.54	266.71	0.000	60.28	0.000	17.16	0.000
	High	6.23	1.52	4.41	2.05						
Worry	Low	1.47	0.88	0.98	0.82	96.87	0.000	85.13	0.000	0.18	0.672
	High	2.90	0.87	2.38	1.02						
Self-Efficacy	Low	4.01	0.68	4.19	0.66	38.26	0.000	23.29	0.000	0.03	0.876
	High	3.28	0.73	3.47	0.76						

Note. DT: Distress Thermometer.

The current study was a preliminary trial to optimize cancer care in Taiwan from a psychological perspective. Patients who met the inclusion criteria were free to choose if they wanted to participate in the psychoeducational program. Although refusing psychological help is not a unique problem to Taiwanese patients, a review study concluded that about 38.8% of cancer patients reported “no need for psychosocial services and supports” and had various types of negative perceptions and stigma about psychosocial care [22]. It was not easy to invite patients to join the program, as most of them were focused on the physical part of their disease. To promote psychological health in the hospital, it was almost ethically mandatory for our team to explain the possible benefits of the program and encourage patients to participate during the invitation process. Thus, a randomized controlled design is difficult to implement. Lacking control groups was a primary limitation of this study. Without a control group to compare with, it is inadequate to conclude if the treatment did help to reduce distress and worry. For instance, the decrease in distress might be a self-recovery process or reflecting a usual change after being diagnosed and treated with cancer. A meta-analysis study found that cancer patients had the highest prevalence rate of depression during treatment and declined with time [23]. A study focused on breast cancer patients showed the prevalence rate of depression (12%) and anxiety (34%) at the time of diagnosis and declined to 24% and 6%, respectively, 3-month later [24]. Second, as a preliminary study, we would like to invite various patients into the program to test its applicability. Thus, we did not use the stage of the disease or treatment experiences as part of the selection criteria. Also, the collection of medical data was restricted to a minimum. Therefore, the current study did not have enough data or sample size to clarify, for instance, if the program is more effective for those at an earlier stage or those under a particular type of surgery. With these limitations, however, the results showed that the subjective evaluation of patients' emotional distress might provide a meaningful classification for predicting the effective duration of the program. The benefits of the psychoeducational program may last longer for breast cancer patients who have higher preoperational DT scores.

Further studies with larger scales, rigorous control (e.g., randomized control trials), comparable groups (e.g., patients in different sights that did not provide the program), and comprehensive designs (e.g., including more psychological, physical, and medical variables) are needed to clarify the effectiveness of the Preoperational Health Psychology Education program.

**Table 3**  
Results of the Mixed-Designed ANOVA from Time0 to Time2 (n = 83).

Variables	DT	Time0		Time1		Time2		Group		Time		Group X Time	
	Group	Mean	SD	Mean	SD	Mean	SD	F	p	F	p	F	p
Distress	Low	1.77	1.09	1.41	1.75	2.00	1.52	121.19	0.000	17.11	0.000	16.15	0.000
	High	6.30	1.48	4.16	2.18	3.98	2.34						
Worry	Low	1.45	0.91	0.97	0.82	1.17	0.80	51.00	0.000	25.90	0.000	5.81	0.005
	High	3.02	0.93	2.33	1.13	2.09	1.11						
Self-Efficacy	Low	4.08	0.69	4.23	0.68	4.01	0.75	16.15	0.000	1.90	0.163	2.97	0.068
	High	3.36	0.84	3.53	0.92	3.65	0.89						

Note. DT: Distress Thermometer.

#### 4.2. Innovation

Compared with other preoperational interventions, the most innovative part of the Preoperational Health Psychology Education program is to use a relatively rare one-session design and applied it to a less-studied population, Asian cancer patients. The results demonstrated that it is effective in decreasing distress and worry among Taiwanese patients with breast cancer. Moreover, the program's effect was observed to last for three months or more after the surgery of patients with higher preoperational emotional distress.

In most Asian countries, mental health care has never had a strong precedence [25]. Compared with people from Western developed countries, most Taiwanese people do not think highly of psychological issues while facing physical illness such as cancer. Thus, people may benefit more from psychological intervention because they have fewer prior experiences with this type of services. In other words, Taiwanese patients with cancer might start with a lower baseline. To our knowledge, the Preoperational Health Psychology Education program is the first psychological intervention program designed for preoperational use in Taiwan. Thus, most of its participants were new to the concept of stress management or have never had any psychological education at all. This might be one of the reasons why the current psychoeducational program was effective. Most of our participants appreciated the program and stated that they felt more positive, comforted, supported, and less stressed after the program. In addition, our medical team observed that the participants looked more relaxed after the program.

#### 4.3. Conclusion

The Preoperational Health Psychology Education program appears to be an innovative solution to optimize psychosocial care in Asian cancer patients. Furthermore, applying the DT cutoff score of 4 (according to the NCCN practice guideline [16]) to assign participants to different groups helped clarify the effectiveness of this psychoeducational program. In the current study, the long-term effect found in the high DT group, but not in the low DT group, may not only reconfirm the validity of the NCCN DT cutoff score but also support that a higher DT score indicates higher distress and a higher need for preoperational psychological intervention.

## Author statement

Jui-Ko Hung: Conceptualization; Writing – original draft preparation, reviewing and editing; Approval of submitted version.

Wen-Hung Kuo: Data interpretation; Supervision; Patient Recruiting; Resource; Approval of submitted version.

Chang-Chang Tseng: Conceptualization; Resources; Supervision; Writing-Reviewing and Editing; Approval of submitted version.

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Chih-Hsun Wu: Conceptualization; Data analysis and interpretation; Writing – original draft preparation; Writing- Reviewing and Editing; Approval of submitted version.

## Declaration of competing interest

All authors declared no conflict of interests.

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.pecinn.2021.100001>.

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