

# Meditation Care Program for Anxiety and Breathing Control in Persons with Weaning Difficulties: A Randomized Control Trial

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**Abstract:** Suffering from weaning failure leads to mind-body disharmony; however, reducing anxiety and self-reliance on breathing control may inspire patients' capability to wean from mechanical ventilation. This randomized controlled trial examined the effects of the Integrated Concentration Meditation Care Program on anxiety level and breathing control among 54 participants suffering with difficult weaning from mechanical ventilator. Participants were randomly assigned to either the experimental (n=23) or the control group (n= 31). The experimental group received nine steps of a nurse-initiated strategy called "GREATWEAN" (Goal setting, Reducing fear and anxiety, Engaging the family to be present with the patient, Active involvement of the patient, Technology safely and appropriately used, Working together, Empowerment, Assessing, and Nurturing) in addition to usual care, while the control group received only usual care. Data collection instruments were: a) Demographic Data Record Form, b) Visual Analogue Scale for Anxiety, and c) Breathing Control measured by respiration rate, minute ventilation and oxygen saturation in an Observation Record Form.

The findings showed a statistical significance in anxiety reduction in the experimental group as compared to the control group at day 3 and 7 of the program implementation, whereas self-breathing control was not significant difference between the two groups. The meditation care program can be applied to reduce anxiety level in persons with difficult weaning.

*Pacific Rim Int J Nurs Res 2017; 21(1) 18-31*

**Keywords:** Anxiety, Breathing Control, Meditation Program, Randomized Controlled Trial, Thailand, Weaning Difficulties

## Introduction

Efforts to reduce the duration of mechanical ventilation by improving the weaning process of persons who are critically ill has remained a problem due to the complexity of their illness and treatment.<sup>1</sup>

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A previous study<sup>2</sup> described weaning categories as simple weaning, difficult weaning and prolonged weaning. The last International Consensus Conference in Intensive Care Medicine in Budapest, Hungary defined difficult weaning as failure of the first weaning trial and requiring up to 3 spontaneous breathing trials or 7 days to achieve successful weaning.<sup>3</sup> In addition, a literature review revealed the significant number of weaning difficulties and prolonged weaning account for 30% of weaning population.<sup>4</sup> The most common causes of weaning difficulty are related to physiological and psychological problems.<sup>5</sup>

Typically, fear and anxiety due to an initial weaning failure affect the patient's cognition in the following weaning session and may lead to a difficulty in weaning from mechanical ventilation.<sup>6</sup> In addition, dyspnea has been addressed as suffering<sup>7</sup> and influences cognitive impairment in the weaning process.<sup>8</sup> In this condition, mind-body disharmony is more likely to occur during weaning.

A general weaning protocol was considered rigid for a heterogeneous population, however it provides a good standard and a framework for practice and inter-professional communication,<sup>4</sup> and where physical problems such as discomfort, impaired communication, and increased work of breathing are addressed.<sup>4</sup> However, fear, lack of control, realization of death, and lack of self-control have been found as psychological problems during weaning.<sup>4</sup> Mind-body disharmony has been a concern in ICUs since anxiety can alter homeostasis in breathing patterns, with an increased respiration rate, hyperventilation, and dyspnea associated with fear of dying and losing self-control.<sup>9</sup> The severity of anxiety can manifest as distorted perception<sup>9</sup> and its outcome could be medical device disruption and increased oxygen consumption.<sup>10</sup> Therefore, the challenging phenomena for nurses in caring for patients with DWMV includes anxiety reduction, increased cognition and self-control.

Several relaxation techniques use an indirect thought control method. For example, the Anxiety-Agitation in Critical Illness Model was developed to

improve patients' cognition and control anxiety.<sup>10</sup> Other relaxation techniques have been used to reduce anxiety such as relaxation breathing<sup>11</sup>, music therapy<sup>12</sup>, and mindfulness-based stress reduction and cognitive therapy, which reduce anxiety and improve cognition.<sup>13</sup>

Meditation is another strategy for persons with anxious to control their mind. A number of studies to date have examined the effect of meditation on anxiety symptoms in Thais with ventilator and shown positive results such as a reduction in anxiety, heart rate, and blood pressure levels.<sup>14,15</sup> However, little is known about the effects of meditation based on Buddhist philosophy on patients' self-breathing control to overcoming suffering (*dukka*) by enhancing self-reliance.

Due to the difficulties managing physical and psychological problems and maintaining patients' comfort during a weaning session in a critical care environment, it is suggested that their significant others should be actively involved. However, their roles in the weaning process have not been clearly articulated. Thus, the purpose of this study was to determine the effectiveness of a comprehensive program using Concentration-Meditation based on Buddhist concepts.

## Theoretical Framework

The theoretical framework used to guide the Integrated Concentration Meditation Care Program (ICMCP) was derived from the integration of the concepts of self-reliance based on Buddhist philosophy, collaboration, and holistic care. According to Buddhist philosophy, self-reliance is defined as "human beings learn to be independent and to have faith in their own ability."<sup>15</sup> This may improve cognition and enhance the consciousness or concentration on spontaneous breathing during the weaning period. Buddhist philosophy was applied to explain the nature of the truth that patients with DWMV suffer from weaning difficulty.<sup>7</sup> Suffering (*dukkha*) refers to dyspnea which leads to less of self-control caused by physical and psychological

factors (*samudaya*). A way to extinguish suffering (*nirodha*) refers to preparation of the patient's readiness for weaning to gain more consciousness on breathing and control (*magga*).<sup>16</sup> The mental training (*samadhi*) and the concept of concentration known as proper concentration (*sammāsamadhi*) or concentrated mind on breathing is then introduced for respiratory management to calm the mind and body.<sup>16</sup> In addition, increasing a person's own capability with the here and now breathing technique was used as a mental training<sup>16</sup> with the support of family and nurses.

Moreover, good teamwork contributes to weaning success.<sup>17</sup> Teamwork needs to be flexible and accepting others' ideas in order to create a powerful sharing partnership.<sup>18</sup> Collaboration has to address the purpose of work in order to achieve successful outcomes.<sup>18</sup> The complexity of weaning difficulty requires that an integrated process, involving intention, behavior, culture, and a system or structure of the care team for patients with DWMV, is needed in driving weaning success.<sup>19</sup> In this study, the developed Integrated Concentration Meditation Care Program (ICMCP) was incorporated with the GREATWEAN strategy for patients with DWMV in order to maintain their comfort during a weaning session. The detail is presented in experimental intervention below.

### **Study Aim and Hypothesis**

The aim of this study was to compare the anxiety level and self-breathing control between the patients in the experimental (ICMCP) and control groups with the following hypotheses:

After receiving the intervention program for 3 and 7 days,

1. The anxiety level in the experimental group would be lower than that of the control group, and
2. The respiration rate would be more decreased, whereas minute volume and oxygen saturation would be more increased in the experimental group than in the control group as compared to the base line measurements.

### **Methods**

**Design:** A randomized control trial.

**Sample and Setting:** Purposive sampling was used to select participants from intensive care settings of three public hospitals in southern Thailand that were similar in number of beds (8–12 ICU beds), nurse–patient ratios (1:2 or 1:3), offered general health care services, and used a similar weaning guideline. A previous study using a deep breathing technique and respiratory biofeedback in patients with weaning difficulty<sup>20</sup> was used to compute the sample size using a significance level of .05, and a power of .80<sup>21</sup> which presented a large effect size of .91, so then a sample size of 22 was planned. Due to the complexity of illness and intervention program, the dropout rate was likely to occur, thus, the number of participants then increased to 30 per group.

The inclusion criteria were: 1) Buddhist; 2) aged  $\geq 18$  years; 3) currently usage of mechanical ventilation for  $\geq$  five days or had a history of reintubation at least once but not more than three times; 4) anxiety score: VAS–A  $\geq 30$ ; 5) alert and able to communicate via verbal or nonverbal behaviors; 6) able to be followed up when discharged to other units; and 7) having the support of at least one family member who could be present during the program sessions. Exclusion criteria was: 1) having received cardio–pulmonary resuscitation (CPR) and requiring full mechanical ventilator support due to severe complications; 2) receiving palliative care without any plan to wean off mechanical ventilation; and/or 3) having evidence of a severe psychiatric disorder. A simple randomization technique<sup>22</sup> was used to allocate patients in either group based on a period of study (maximum time of ICU admission was four months). However, due to the complexity of the patients' conditions in this study during data collection, some were withdrawn (as shown in Figure 1) for such reasons such as: (1) being unwilling to participate in the study; (2) having a lower level of consciousness [GCS was less than 10

(intubated)]; (3) having discontinued weaning by the physician; or (4) having a failure of extubation.

As shown in Figure 1, 35 and 31 participants were assigned into the ICMCP group and control group respectively. However, a refusal rate in the ICMCP group was 34.3% with several reasons. The

main one was that participants delayed their decision on whether or not they wanted to participate in the ICMCP. At day seven, 12 and 11 participants were remained, then over seven days of the study, missing data was 21.7% and 25.8% in the ICMCP group and control group, respectively.

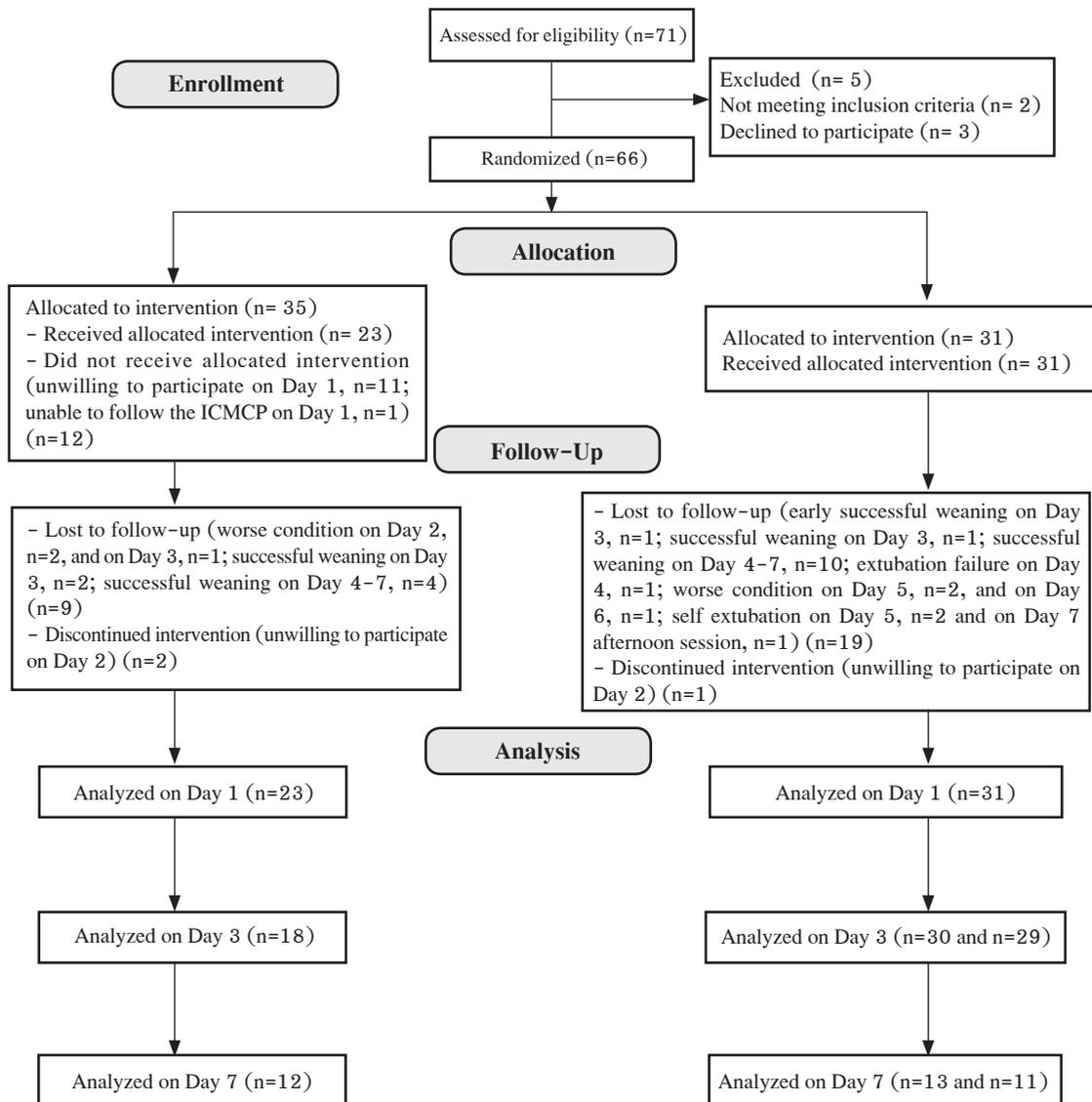


Figure 1 CONSORT flow diagram of participants included in study

## **Instruments**

**Demographic Data Form:** comprised items on age, gender, body weight, primary diagnosis, disease classified by ICD-10, severity of physical illness on admission using APACHE II to assess the severity score<sup>23</sup> ventilator days prior to study, anxiety scores at baseline, experience of weaning attempt, experience of meditation and serum albumin.

**The Vertical Line Visual Analogue Scales for an Anxiety (VAS-A)** developed by Chlan<sup>24</sup> was used for assessing the degree of participants' anxiety. This measure consists of 0-100 in a vertical line, which was correlated with the standardized assessment tool of 20 items in the State Anxiety Inventory (SAI) with  $r = 0.50, p=0.01$ .<sup>24</sup> A lower score reflects lower anxiety. VAS-A was recommended to be used with patients with a mechanical ventilator.<sup>25</sup> Reliability was tested on ten persons receiving mechanical ventilation by using a test-retest within 24 hours that yielded a Pearson's correlation value of 0.75.

**Breathing Control Observation Record Form:** was developed by the investigators for respiratory monitoring including respiratory rate, minute ventilation (volume of gas inhaled or exhaled per minute recorded from a ventilator screen) and oxygen saturation (recorded from a pulse oximetry). Validity and reliability testing of the parameters for respiratory were performed using the annual equipment calibration for accuracy and precision.<sup>26</sup> The inter-rater reliability between the investigator and three research assistants was piloted with 3 weaning patients, yielding a correlation coefficient of 0.92.

### **Procedure:**

Patients in experimental group and control group received usual care. The procedure for usual care included airway clearance, screening for readiness to wean<sup>27</sup> carried out for appropriate decision-making, weaning modalities based on ICU weaning protocol or individual consideration by the attending physician,

observations of signs and symptoms for respiratory distress, and respiratory muscle resting with full support mode or the last setting.<sup>2,3</sup> All participants in both groups were assessed for outcome measures (anxiety score, respiratory rate, minute ventilation, and oxygen saturation) at baseline and twice a day for seven days.

**Experimental Intervention:** The manual of here-and-now technique of meditation lasting for 15 minutes, three times a day for two consecutive days<sup>14</sup> was chosen. The meditation period was based on meditation short course training in Thailand which generally took 7 days; therefore, the ICMCP was designed for 30 minutes in each session for 7 days. The concept of collaboration<sup>18</sup> was applied to identify the role and function of patient-nurse-family member. In addition, a holistic concept<sup>19</sup> was used to guide step-by-step nursing practice under the GREATWEAN strategy. The ICMCP was designed in two phases to be performed for seven days.

*Phase 1: Day 1*, the GREAT strategy for the preparation phase was performed. Participants were prepared and trained for concentration meditation by: 1) **G = Goal** setting with involvement of three parties (patient-nurse-family member), and with the agreement of the attending physician in implementing the ICMCP; 2) **R = Reducing** fear and anxiety by demonstrating and teaching the meditation practice to participants, using a five minute CD of concentration meditation to guide a practice and asking the participants to practice this meditation for 30 minutes during a weaning session; 3) **E = Engaging** the family by asking them to accompany the participant during meditation session, and practice time (twice a day depending on their available time); 4) **A = Active** involvement of participants by encouraging them to regularly practice concentration meditation; and 5) **T = Technology** safely and appropriately used by applying a weaning modality appropriate to each participant. To ensure the validity of meditation practice in each session, the PI coached and observed the proper practice of

concentration meditation based on the ICMCP. In addition, participants were asked to rate their self confidence in practicing the meditation using the VAS-C. A visual analogue scale was depicted as a vertical line of confidence (scores from 0 to 100). Anchor words on the vertical line are “no confidence to practice at all” at the bottom and “the most confidence to practice” at the top of the scale. The acceptable score of over 80 for self-confidence was required. During this phase, a researcher or ward nurse assessed the participant’s readiness to wean based on the ward weaning protocol, including analyzing the causes of weaning difficulty in regards to any physical problems and psychological problems, and informed the participant and the family member.

*Phase 2: Day 2–7 of action phase:* sessions were performed twice a day, in the morning and afternoon. The AT-WEAN strategy for the action phase (Day 2–3) was performed continuing from the first phase of AT and followed by 6) W = Working together: the nurse-participant-family caregiver cooperated in the weaning period, 7) E = Empowering the participant: the nurse and family caregiver encouraged the participant to be the key person in driving weaning success, 8) A = Assessing: the participant self-evaluated their respiratory rate and ability to tolerate the SBT, and recorded their anxiety scores in each session (twice a day in morning and afternoon), and 9) N = Nurturing: the family caregiver motivated, supported and encouraged the participant to meditate during weaning process. The N-G strategy was performed on Day 4–7 during the action phase to evaluate progress and reset the goal. The protocol of GREATWEAN was initially completed in three days, but was continued for seven days to look for subsequent effect. In addition, the result was tested for a short term period based on the situation in the critical care environment, and also from suggestions from previous studies.<sup>14, 15</sup>

Three research assistants (RAs) in the three settings collected the data in both groups for seven

days. On Day 1, the RAs recorded the participants’ personal information, the weaning modality and protocol, and measured the anxiety scores, respiration rate, minute ventilation, and oxygen saturation which were taken twice a day. In addition, the RAs observed the participants in any weaning modality change including behavioral observations for one hour during a weaning session. During Day 2–7 of the action phase, the RAs continued recording all outcome measures twice a day on a regular basis.

***Ethical Considerations:*** Prior to data collection, the study was approved by the Research Ethics Committee, Faculty of Nursing, Prince of Songkla University, and the institutional review boards of the study hospitals. Participants and family members gave written consent after receiving written and verbal information regarding the purpose and processes of the study, including details of collecting data, the duration of the study, and the potential risks and benefits of participation and measuring procedures, confidentiality, and the right to withdraw. The PI respected the decisions of the participants to withdraw from the study at any time without any treatment repercussions.

***Data Collection:*** Data were collected during March 2013 to February 2015. Among the three research settings, the study started at different time points. Before starting a data collection, the PI set up a timeframe for one year with three periods of 4-months in each hospital. Equal chance was performed for allocation. Preliminary, five envelopes for the experimental group and five envelopes for the control group were prepared for participants in each period. Consequently, nine envelopes out of ten were randomly selected by the PI to set up the schedule for working in three hospitals.

***Data Analysis:*** The missing data was tested and found that they were missing at random; so a decision was taken to ignore the missing data. Consequently, 54 participants were analyzed. Descriptive statistics were used to assess the demographic characteristics.

Differences between the demographic and health characteristics were evaluated by the independent-t-test, Mann Whitney U-test, chi-square test, and Fisher's exact test; based on their assumptions. In addition, inferential statistical analysis for anxiety scores and self-breathing control were performed to examine the difference in mean score measured in the afternoon on Day 3 and 7 using Friedman's test, Wilcoxon signed ranks test, and Mann Whitney U-test.

## Results

Demographic data are summarized in **Table 1**. Findings revealed that the participants' age, APACHE II score, body weight, anxiety score at baseline, gender and diagnosis were not significantly different across the groups. However, serum albumin <3g/dl, experience of weaning attempt  $\geq 1$ , and no experience in meditation in the experimental group were significantly higher than that of the control group.

**Table 1** Comparison of Baseline Characteristics of Participants Between Experiment and Control Group

Variables	The Experimental group (n = 23)	The Control group (n = 31)	t-test	Chi-square/ Fisher's Exact test	p
1. Age (yrs)	58.26 (21.28) <sup>a</sup>	64.03 (18.99) <sup>a</sup>	1.049	-	.299
2. APACHE II	18.94 (4.18) <sup>a</sup>	19.17 (5.32) <sup>a</sup>	-.139	-	.890
3. Body weight (kg)	59.57 (12.75) <sup>a</sup>	53.13 (11.91) <sup>a</sup>	1.906	-	.062
4. Ventilator days before study (day)	25 (29.98) <sup>a</sup>	10.77 (10.20) <sup>a</sup>	-2.184 <sup>b</sup>	-	.038 <sup>b*</sup>
5. Anxiety score at baseline	52.61 (23.78) <sup>a</sup>	63.23 (14.92) <sup>a</sup>	1.884 <sup>b</sup>	-	.068 <sup>b</sup>
6. Gender					
> Male	11 (52.17%)	16 (51.60%)	-	.076	.783
> Female	12 (47.83%)	15 (48.40%)			
7. Diagnosis					
> Diseases of the respiratory system (COPD, asthma, and pneumonia)	10 (43.48%)	15 (48.40%)	-	.128	.721
> Others (e.g., injury, diseases of circulation system, neoplasm, etc.)	13 (56.52%)	16 (51.60%)			
8. Blood testing results					
> albumin < 3g/dl					
• Yes	13 (56.52%)	5 (16.13%)	-	9.694	.002*
• No	10 (43.48%)	26 (83.87%)			
9. Experience of weaning attempt					
> The first attempt	7 (30.40%)	19 (61.30%)	-	5.035	.025*
> $\geq$ one attempt	16 (69.60%)	12 (38.70%)			
10. Experience of meditation					
Yes	6 (26.09%)	23 (74.20%)	-	12.290	.000*
No	17 (73.91%)	8 (25.80%)			

Note: <sup>a</sup> mean (SD), <sup>b</sup> equal variances not assumed, \*p<.05

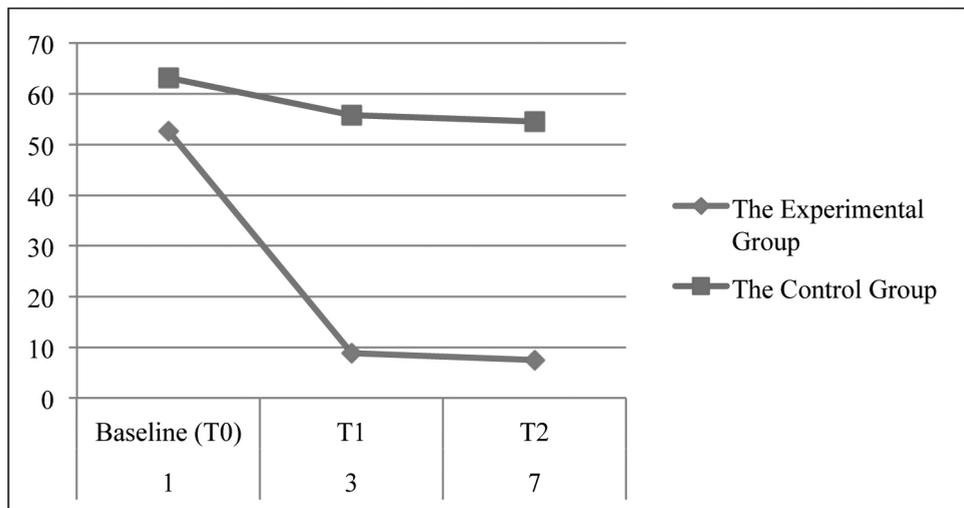
Anxiety scores: **Table 2** and Figure 2 demonstrate a dramatic decrease in anxiety from baseline to post-intervention on Day 3 then slight changes on Day 7 in the experimental group, while little changes of anxiety score over 7 days were found in the control group. The Friedman Test showed a significant difference in anxiety on post-intervention scores of day 7 in the experiment group ( $\chi^2_{(13)} = 44.26, p < .05$ ) while no significant difference was shown in the control group ( $\chi^2_{(13)} = 18.67, p > .05$ ). In addition, the Wilcoxon

signed ranks test was used in the experiment group and indicated that anxiety in post-intervention scores on Day 3 and Day 7 were statistically significantly lower than those in the base-line ( $Z = -3.443, p < .05$ ;  $Z = -3.088, p < .05$  respectively). To test the first hypothesis using the Mann-Whitney U-test, it was shown that after receiving the intervention program for 3 and 7 days, the anxiety level in the experimental group was significantly lower than that of the control group ( $U = 40.50, U = 15.00, p < .05$ ; respectively) (**Table 3**).

**Table 2** Mean Anxiety Scores in Experimental and Control Group at Baseline, Post-intervention in the Afternoon on Day 3 and Day 7

Day	Time	Experimental Group		Control Group	
		N	Mean (SD)	n	Mean (SD)
1	Baseline ( $T_0$ )	23	52.61 (23.78)	31	63.23 (14.92)
3	$T_1$	18	8.89 (19.37)	29	55.86 (21.13)
7	$T_2$	12	7.50 (13.57)	11	54.55 (30.45)

Note: Baseline ( $T_0$ ) = pre-intervention on day 1;  $T_1$  and  $T_2$  = post-intervention in the afternoon.



**Figure 2** Line graph showing the mean scores of anxiety at baseline ( $T_0$ ) on day 1, post-intervention in the afternoon on day 3 ( $T_1$ ) and post-intervention in the afternoon on day 7 ( $T_2$ ) in the experimental group and control group

**Table 3** Comparison of Mean Anxiety Scores Between Experimental and Control Group at Post-Intervention on Day 3 and Day 7

Day	Group	Mean	Mean Rank	n	Mann Whitney U Value	Mann Whitney U Prob
Day 3 afternoon	Experiment	8.89	11.75	18	40.50	.000*
	Control	55.86	31.60	29		
Day 7 afternoon	Experiment	7.50	7.75	12	15.00	.001*
	Control	54.55	16.64	11		

Note: \* $p < .01$

Self-breathing control: The Friedman Test showed that there were no significant differences of respiration rate, minute ventilation, and oxygen saturation at post-intervention on Day 7 both in the experimental group ( $\chi^2_{(13)} = 8.75, \chi^2_{(13)} = 16.92, \chi^2_{(13)} = 4.48, p > .05$ ; respectively) and in the control group ( $\chi^2_{(13)} = 20.13, \chi^2_{(13)} = 15.26, \chi^2_{(13)} = 12.51,$

$p > .05$ ; respectively). On testing the second hypothesis using the Mann-Whitney U-test, there was no significant differences in respiration rate, minute ventilation, and oxygen saturation at post-intervention on day 3 and day 7 between the experimental group and the control group ( $U = -1.30, U = -.16, U = -.57, p > .05$ ; respectively) (Table 4).

**Table 4** Comparison of mean scores of respiration rate, minute ventilation and oxygen saturation between experimental (n=12) and control group (n=11) at post-intervention on day 7

Variables/Groups	Mean Rank	Sum of Ranks	Mann-Whitney U- test	p
Respiration rate				
Experimental group	13.75	165.00	-1.30	.193
Control group	10.09	111.00		
Minute ventilation				
Experimental group	12.21	146.50	-.16	.877
Control group	11.77	129.50		
Oxygen saturation				
Experimental group	12.63	151.50	-.57	.570
Control group	11.32	124.50		

Note:  $p > .05$

## Discussion

Findings showed that the ICMCP significantly reduced anxiety levels while the program did not improve other three parameters over time. The results of this study are consistent with a previous study

showing that meditation program reduced anxiety symptoms.<sup>14</sup> The ICMCP focused on the 30-minutes of meditation practice which included concentration and relaxation in each session over 7 days. In fact, participants with DWMV often had a change of breathing over the weaning period. The main physical

barrier factors were dyspnea, abdominal discomfort, and vomiting. Due to respiratory muscle weakness from Day 4, only a half of participants in the ICMCP could strictly concentrate on their breathing for 30 minutes. However, participants could achieve the stage of momentary concentration which is called a momentary meditation (*kanikasamadhi*).<sup>16</sup> In this regard, mind and body connection was explained by the mechanism of psycho-neuro-immunity (PNI)<sup>28</sup>; thus, calming of the mind and the body occurred. This was consistent with the previous findings in that a brief meditation for 25-minutes of mindfulness meditation for 3 days reduced psychological stress reactivity in healthy people.<sup>29</sup> In addition, the anticipation of fear and anxiety influences a person's feeling of apprehensiveness in facing the next weaning session.<sup>6</sup> Reducing anxiety was a major achievement resulting from the ICMCP.

However, the respiration rate, minute ventilation and oxygenation did not improve for several reasons. *Firstly*, physical problems were found and there were high missing rates: 21.7% in the ICMCP group and 25.8% in the control group. Physical illness had led to a worsening condition (infection) in both groups and one participant in the ICMCP group died after a day of discontinuing weaning. Infection due to prolonged intubation, or death, was typically responsible for the drop-out rate.<sup>5</sup> Those in the ICMCP group had a significant respiratory marker of low albumin as compared with the UC group (56.52% and 16.13%). Respiratory muscle weakness is associated with low albumin<sup>30</sup> resulting in difficulty to control the breathing. The physical symptoms associated with abnormal breathing were the main barrier to breathing control and dyspnea in the weaning periods. In this regard, more difficult weaning problems were demonstrated in the ICMCP group in terms of respiratory complications, particularly in those patients with lung infection, lung atelectasis or cardiac dysfunction like cardiomyopathy. Lung infection and atelectasis can increase airway resistance and lead to an increased work of breathing,

resulting in an imbalance of ventilatory demand and capacity.<sup>31</sup>

In addition, some participants in the CICMP group showed a complexity of illness such as a young participant who was diagnosed with C-spine injury with lung infection and lung atelectasis, then demonstrated a hardly any control of breathing. Breathing pattern was rapid and shallow with low tidal volume and minute ventilation. The C-spine injury affected self-breathing control owing to muscle paralysis and abnormal breathing pattern. This may affect the respiratory impulse transmission from the phrenic motor nucleus to the thoracic and abdominal musculature.<sup>32</sup> Older people in the experimental group might have needed more time to regain their recovery as a result of co-morbidity or complications such as an electrolyte imbalance post-major surgery, cardiomyopathy associated with arrhythmias, and fluid volume overload. As to this point, cardiac dysfunction develops an increased end-diastolic pressure, and occasionally impends to pulmonary edema, dyspnea and a restrictive lung disease.<sup>33</sup> The increased work of breathing results in weaning difficulty, caused by increased intra-pleural pressure and lung resistance, and then decreases lung compliance.<sup>34</sup>

*Secondly*, family caregivers are significant people for supporting and empowering the patient ability to breath.<sup>31</sup> However, only half of the family members continuously participated in the ICMCP. One possible reason reported by the family members who did not participate throughout the program was that they trusted the PI and the weaning care team, and they had to go to work. This might have resulted in the participants being less able to adhere to or practice the spontaneous breathing trial (SBT). In addition, the missing rate reduced the sample size leading to a type II error, which may have demonstrated any effect of the ICMCP on self-breathing control between the ICMCP group and the control group. Moreover, family issues may need to be explored to find any significant difference between those who had family

and those who did not. However, additional analysis was impossible due to small sample size.

*Thirdly*, past experience of meditation and weaning attempt may be helpful for some during the period of weaning. Meditation needs regular practice, and participants in the control groups were more experienced at meditation than participants in the experimental group. A study<sup>36</sup> revealed that participants who had previously undertaken meditation training would have increased familiarity with the meditation practice, known as meditation-induced relaxation. Hence, the past experiences of participants could have facilitated the initiation of relaxation during the weaning process. In addition, experiences of several weaning attempts may cause failure of breathing control due to more fear and suffering<sup>6</sup>. However, findings from additional analysis in this study did not show a significant difference of anxiety scores between those who did and did not have any experiences of meditation or those who did and did not have any experiences of weaning attempt. Due to a small sample size, this issue needs further study.

In the control group, the weaning guidelines that ward nurses used may not be effective due to some factors. These include problems with guideline adherence if implementation occurred with unclear policy support and active participation,<sup>4,27</sup> and the weaning practice was mainly focused on reducing physiological factors and less directed to psychological factors in regards to cognition and behavior problems.<sup>37</sup> The notion of persons cooperating with the weaning care team and relying on their own capabilities in breathing control was also essential to manage physical problems in accordance with psychological problems and maintain the person's comfort during a weaning session. Therefore, the challenging phenomena for patients with DWMV should include anxiety reduction, and their increased active involvement in self-control as described in ICMCP.

## **Limitations**

Since the study's intervention was a short period of meditation training, some participants may require more time to follow up after completion of the ICMCP program. Future studies need to consider evaluating those who have experiences in meditation and those with active family engagement along the process of weaning to assess the intervention effectiveness. In addition, the sample was obtained mainly from older people in three public hospitals which may limit generalization to other populations. The success rate of weaning in this study was unclear due to a small sample size and high attrition rate; the weaning success outcome may be limited.

## **Conclusions and Implications for Nursing Practice**

Even despite the limitations mentioned above, the findings of this study demonstrate significant anxiety reduction after receiving the ICMCP. Thus, the ICMCP should be introduced to persons with DWMV in weaning process. In addition, the findings have implications for designing and implementing effective training of meditation interventions for those who did not have a meditation in a short period of time. Further study is required with larger sample size and extends more time for follow up to measure the rate of weaning success.

## **Acknowledgements**

The authors thank all participants and nurses for their contributions to this study, and acknowledge the scholarship support provided by the Graduate School, Prince of Songkla University, Thailand.

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*Meditation Care Program for Anxiety and Breathing Control in Persons*

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# โปรแกรมการดูแลแบบผสมผสานโดยใช้สมาธิ ต่อความวิตกกังวลและการควบคุมการหายใจในผู้ป่วยหยาเครื่องช่วยหายใจยาก: การศึกษาเชิงทดลองแบบสุ่มและมีกลุ่มควบคุม

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**บทคัดย่อ:** ทุกข์จากการหยาเครื่องช่วยหายใจไม่สำเร็จ เกิดจิตและกายไม่สมดุล จากแนวคิด “ตนเป็นที่พึ่งแห่งตน” ในการควบคุมการหายใจ “เป็นการส่งเสริมความสามารถของผู้ป่วยในการหยาเครื่องช่วยหายใจ การศึกษาเชิงทดลองแบบสุ่มและมีกลุ่มควบคุม มีจุดประสงค์เพื่อทดสอบผลของโปรแกรมการดูแลแบบผสมผสานโดยใช้สมาธิ ต่อความวิตกกังวล และการควบคุมการหายใจวัด ในผู้ป่วยหยาเครื่องช่วยหายใจยาก กลุ่มตัวอย่างจำนวน 54 คน โดย 23 คนถูกจัดให้อยู่ในกลุ่มทดลอง และ 31 คนถูกจัดให้อยู่ในกลุ่มควบคุม ซึ่งได้รับการดูแลตามปกติ สำหรับกลุ่มทดลองได้รับการดูแลตามปกติและใช้แผนการดูแล “GREATWEAN” มี 9 ขั้นตอน คือ วางเป้าหมายร่วมกันลดความกลัวและวิตกกังวลให้ญาติอยู่กับผู้ป่วย เน้นผู้ป่วยมีส่วนร่วม เทคโนโลยีปลอดภัยเหมาะสม ร่วมใจกันทำ สร้างเสริมพลังอำนาจ ประเมินติดตาม และสนับสนุนต่อเนื่อง เครื่องมือวิจัยประกอบด้วย แบบบันทึกข้อมูลส่วนบุคคล มาตรฐานวัดความวิตกกังวล และการควบคุมการหายใจโดยใช้ อัตราการหายใจ ปริมาตรการหายใจเข้าออกในหนึ่งนาที และความอึดตัวของออกซิเจนจากแบบสังเกต

ผลการศึกษาพบความวิตกกังวลลดลงอย่างมีนัยสำคัญทางสถิติ ในกลุ่มที่ได้รับโปรแกรมการดูแลแบบผสมผสานโดยใช้สมาธิ เปรียบเทียบกับกลุ่มควบคุมในวันที่ 3 และ 7 ของการใช้โปรแกรม โปรแกรมนี้ไม่แสดงให้เห็นถึงความแตกต่างของการเปลี่ยนแปลงความสามารถของผู้ป่วยในการควบคุมการหายใจด้วยตนเอง โปรแกรมการดูแลโดยใช้สมาธินี้ควรนำมาประยุกต์ใช้เพื่อลดความวิตกกังวลของผู้ป่วยที่หยาเครื่องช่วยหายใจยากได้

*Pacific Rim Int J Nurs Res 2017; 21(1) 18-31*

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