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The Effect of Deep Breathing Exercises on Menstrual Pain Perception in Adolescents with Primary Dysmenorrhea

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ABSTRACT

Cyclic menstrual pain, one of the most common gynecologic complaints, is a crucial issue. Unfortunately, only limited studies have focused on how to care for the menstrual pain in adolescents. This paper reports on the effective treatment for menstrual pain to mitigate or preclude menstrual pain perception, which is non-invasive to patients, in adolescents aged from 13 to 15 years. The treatment was conducted by positioning the patient in a supine position. Each patient was guided to take 30 minutes of breathing relaxation techniques. The use of Visual Analogue Scale (VAS) was intended to measure the subjects' painfulness level. This study included 47 respondents whose menstrual pain was monitored in 30 minutes after the intervention. The findings of this study indicate a significant reduction of patients' pain. The study suggests that further studies should focus on complementary treatments for overcoming menstrual pain.

Keywords: Adolescents, deep breathing, pain perception, primary dysmenorrhea

INTRODUCTION

Menstrual pain is one of the most common gynecologic complaints defined as a cyclic pain that occurs in association with menstruation (Bektaş et al., 2010; Tu et al., 2010). The menstrual disturbances as health problems among young girls affect not only reproductive, but also physical health and quality of life (Rad et al., 2018). Around 1.2 billion people, or 1 in 6 of the world's population, are adolescents aged from 10 to 19 (World Health Organization, 2014). Estimates of the prevalence of females experiencing dysmenorrhea vary widely from 16.8% to 81%. It can be severe enough to interfere

with daily activities as well as causing absence from school and work (Yonglitthipagon et al., 2017). Studies conducted in Asia and New Zealand showed that around 42% to 73% of women experienced moderate to severe dysmenorrhoea (Chen et al., 2015).

Pharmacological efforts can be performed by administering analgesic drugs as pain relievers (Smeltzer et al., 2008). Pain management experienced by individuals can be through pharmacological intervention, collaborated with physicians or other primary care providers to the patient. The interaction that occurs in this therapy has a mutually synergistic effect between the two that can be mutually augmented by the therapeutic work without adding the ill effects of pain (Widyawati et al., 2016). This is supported by research that proves that there are side effects when patients take them for a long time. It is therefore against this background that Deep Breathing Exercises (DBE) are suggested as an alternative source of treatment for primary dysmenorrhea (Sosorburam et al., 2019).

Relaxation techniques provide us with excellent methods that can be practiced with awareness anytime at our discretion (Romas & Sharma, 2017). One specific respiratory maneuver in breathing is both popularly and scientifically linked to Deep Breathing Relaxation (Vlemincx et al., 2016). Mind-body science has now reached a stage where it should be accepted (Rakel, 2017). A meta-analysis of 47 actively-controlled trials with 3,515 participants shows that participation in mindfulness instruction programming is effective for improving self-reported symptoms of anxiety, depression, and pain (Sibinga, 2016). The prevalence of dysmenorrhea in adolescents in Indonesia is reported to be 55% (Astutik et al., 2015). In a relaxed state, human body will stop the production of adrenaline hormones and all the hormones that are needed during stress (Bennett, 2017; Bojorquez et al., 2017; Boyanova, 2017). When reducing stress, human body reduces the production of cortisol hormones (Navas et al., 2012), because of the need for relaxation to provide an opportunity for the body to produce hormones, which are important to get menstruation that avoids pain (Droit-Volet et al., 2015).

Spontaneous breathing in healthy persons is characterized by substantial variability (Jafari et al., 2016; Mailhot-Larouche et al., 2017; Romas & Sharma, 2017; Vlemincx et al., 2010). First, taking a deep breath can reduce hypoxia and hypercapnia (Vlemincx et al., 2010). The patient is verbally coached through a modified slow vital capacity maneuver and brought to a reproducible deep inspiration breath-hold level.

Lower rates (84.2%) have been reported for Asia, with 84.2% for Southeast Asia, 68.7% for Eastern Asia, 74.8% for the Middle East, and 54.0% for Southern Asia. Relaxation techniques provide us with excellent methods that can be practiced with awareness anytime at our discretion. Research on alternative treatments in the process of pain management to intensity of pain in menstrual pain will be very helpful in identifying and providing care by midwives (Moyer et al., 2011). The results of the study are expected to be basic data as a cut-off point for midwives in handling menstrual pain in patients on a non-pharmacological basis, thereby reducing unnecessary interventions in midwifery services.

MATERIALS AND METHODS

Data Collection

The location of this study was Junior High School in Ciamis district. The duration of the research data collection was 1 month. This research began by making and modifying movements of deep breath relaxation exercises. Before taking the data, the researcher identified respondents in accordance with the criteria, then the respondents were given informed consent if the respondents agreed to the data collection by questionnaire. Informed consent was obtained from all volunteers and the study was approved by the local ethics committee. The respondents performed deep breathing exercises to eliminate menstrual pain. Exclusion criteria were as follows: any cardiac or respiratory diseases, a history of migraines or other (chronic) pain syndromes, or the use of pain medication or psychotropic drugs.

Procedure

All participants completed the Beck Depression Inventory (BDI) and the "Trait anxiety" part of the State and Trait Anxiety Inventory (STAI-X2). All subjects were instructed not to practice at home and were furthermore not allowed to participate in any breathing exercises or meditation programs during the washout period. After inclusion, all subjects received written handouts explaining the course of the study and an instruction manual for Deep Breathing Exercises (DBE), according to the recommendations from breathing literature (Scheibenbogen & Prieler, 2002). The use of positions of the client and movement lines mentioned for the basic position is in accordance with the operational standard shown in Figure 1.
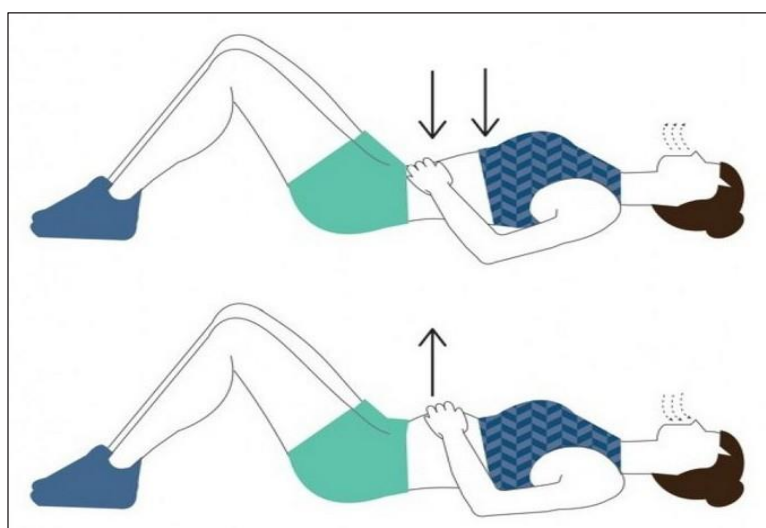

Figure 1. The reference position of breath relaxation technique

Study Design and Samples

The research design used pre-experiment, in which the factors considered were Deep Breathing Exercises (DBE) and pain perception in pre-test and post-test. The results of intervention were analyzed using Wilcoxon ranks test. The number of samples was 47 respondents of adolescents with menstrual pain by choosing subjects whose representation was determined based on the inclusion criteria. Data retrieval was done after the respondents had agreed with breath relaxation techniques.

Data retrieval began when respondents experienced menstrual pain with a 5-10 VAS pain scale, experiencing menstrual pain in the first 24 -48 hours of menstruation, then the intervention was carried out for 30 minutes. A baseline assessment before the intervention was conducted using a questionnaire to collect data on the demographics of the participants and their pain levels. The questionnaire included questions on pain measured using a tenth-point scale. This instruction was provided by a trainer who was certified.

The results of the respondent pain scale questionnaire were collected and then taken to be analyzed by researchers with the assistance from enumerators. Furthermore, the data is presented in the form of an average value distribution of the results of data retrieval. The data that appears is created by the trend results from the measurement results. The research flow chart is shown in Figure 2.
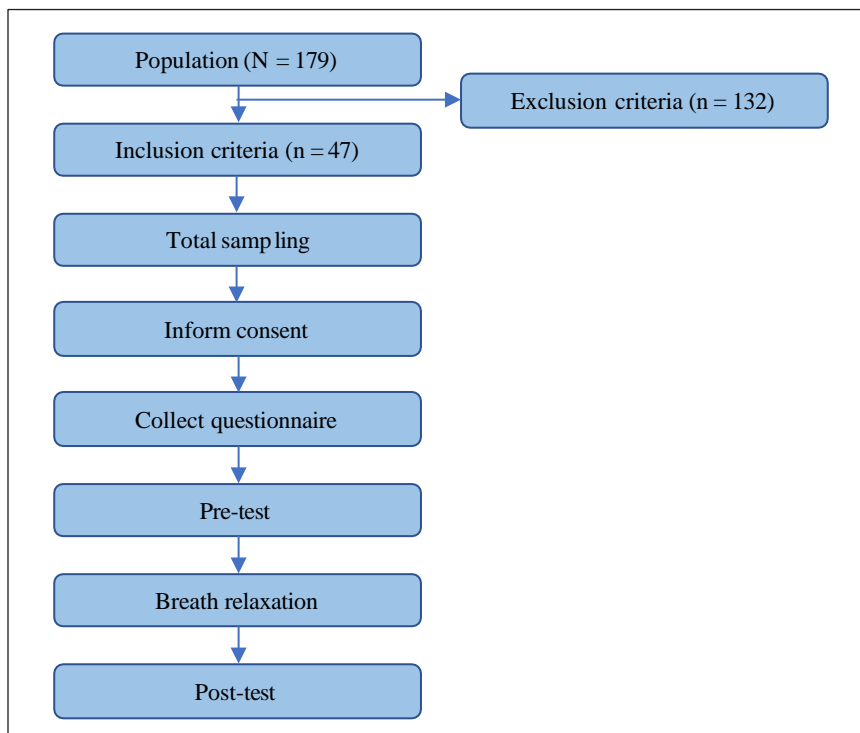

Figure 2. Flowchart measurement

RESULT AND DISCUSSION

Demographic Data of Respondents

This study shows that the average age of respondents were 13.97 ± 2.71 years while the age range of respondents was 13–15 years. The average respondents' grade was 7 ± 14.69 with a range of 7th- 8th. The average pain scale of the respondents' Visual Analogue Scale (VAS) was (6.33 ± 1.63) with a range of 5-10 pain scales. Demographic data of respondents is shown in Table 1.

Table 1
Demographic data of respondents

Characteristics		Number of Respondents (N)	Percentage (%)	Mean
Age	13 y.o	22	46.80	
	14 y.o	4	8.51	13.97
	15 y.o	21	44.69	
Grade	7th	24	51.06	7
	8th	23	49.94	
VAS scale	Low	0	0	0
	Mid	32	68.08	7.02
	High	15	31.02	

Result of Pre and Post Intervention

It indicated that the median post-test ranks, $Mdn = 1.48$, was statistically and significantly higher that the median of pre-test ranks, $p < .000$. Based on Table 2 above, it can be seen that the average frequency of menstrual pain in forty-seven respondents enrolled in this study was decreased in terms of pain that was equal to 9–4 after being given breath relaxation.

Table 2
Distribution and average of menstrual pain

Variable	Pre		Post		p value
	median	Max-min	median	Max-min	
Menstrual Pain	6.39	10-5	1.48	6-2	0.000
Frequency of the pain	4.45	7-2	1.02	4-1	

Pretest. The results of this study indicate the frequency of menstrual pain in adolescents that had a tendency to vary between one and the other. The average maximum frequency that occurred in menstrual pain was on a scale of ten and the average minimum pain is on a scale of six.

Posttest. The average maximum frequency that occurred in menstrual pain after intervention is on a scale of 6 and the minimum pain average is on a scale of 2. VAS scale of menstrual

pain had a tendency to be directly proportional to pretest of breath relaxation technique, moderate to heavy scale with a scale of moderate as many as 30 people (63.83%), and scale of heavy as many as 17 people (36.17%), with an average pain scale of 7.02. VAS scale for post-test proportion of breath relaxation technique was moderate to mild scale with a scale of moderate as many as 6 people (12.77%), scale of mild as many as 31 people (87.23%), with an average pain scale of 3.04. The comparison trend of VAS scale trends in pretest and post-test breathing exercises is shown in Figure 3.
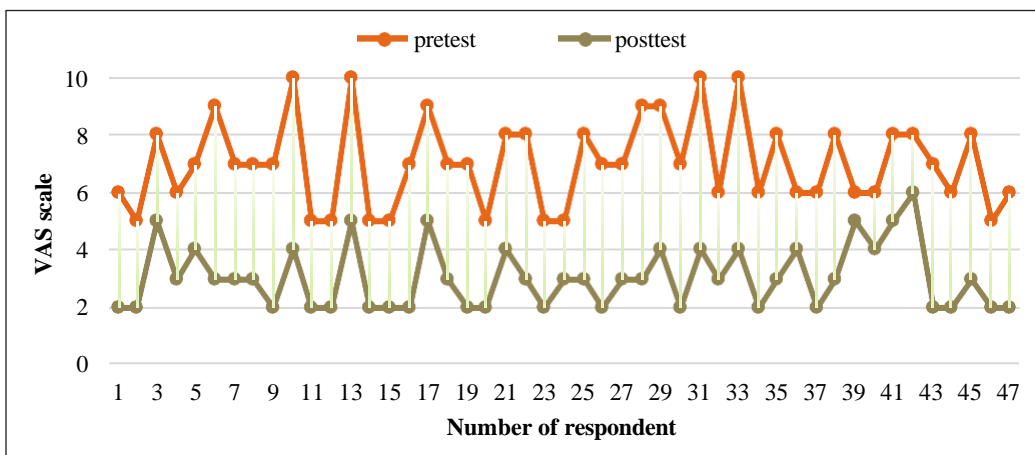

Figure 3. Comparison of VAS scale trends in pretest and posttest deep breathing exercises

The decrease in the intensity of menstrual pain occurs because the students practice breathing relaxation technique within 30 minutes, done when students feel menstrual pain. Previous study shows that the technique of deep breath relaxation is a form of nursing care in which case the health worker teaches the client how to do a deep breath, slow breath (hold maximum inspiration) and how to breathe slowly, in addition to reducing the intensity of pain (Bojorquez et al., 2017). Deep breathing relaxation techniques can also improve lung ventilation and increase blood oxygenation (Smeltzer et al., 2008). These findings corroborate previous studies showing significant decreases in acute negative effect in response to a breath relaxation session (Lin et al., 2014; Lindenmann et al., 2012) and suggest that breath relaxation can buffer against negative effect, perhaps by decreasing rumination and changing affective appraisals and coping with stress (Thelwall, 2017).

Breathing exercises can boost the relaxation and allow participants to focus in mind-body to change their thought on their pain. Based on the results of the study, there was a decrease in the intensity of menstrual pain in female students when practicing breathing relaxation techniques in approximately 30 minutes. This study still used questionnaire instruments in determining the results of research, so enabling the occurrence of bias. Further research should be developed with pain measurements using biomarkers to improve the objectivity of the study results.

CONCLUSION

The decrease of menstrual pain in adolescents with primary dysmenorrhea using breath relaxation technique shows a more quantitative value when compared to pre-test and post-test. The results of this study indicate that the prevalence of menstrual pain in active adolescents with primary dysmenorrhea decreases from 76% to 22% of menstrual pain. There was a decrease in menstrual pain scores in 46.6% of respondents with moderate to severe criteria for pain experienced on the first day. Breathing relaxation interventions have a tendency to be directly proportional to the reduction in the scale of VAS pain experienced by patients.

We will remind you in this paper on how observational studies regarding the perception of menstrual pain in respondents who are prone to various structural biases and limitations are. These biases lead us to be extremely cautious regarding the implementation of the results of this study in clinical practices, and to question the reliability of this study in terms of subjectivity. We recommend the use of another group in similar problem in future studies to get more accurate results.

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