

The Effect of Pelvic Rocking Exercise and Buteyko Exercise on Reducing Primary Dysmenorrhea Pain Levels

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Abstract

Background: Dysmenorrhea is cramping pain and is often followed by lower back pain, nausea and vomiting, headache and diarrhea. Dysmenorrhea refers to the overall pain symptoms that arise during menstruation, there are 2 types of dysmenorrhea, namely, primary and secondary dysmenorrhea. Primary dysmenorrhea is a cyclic menstrual pain without pathological abnormalities in the pelvis is called Primary dysmenorrhea. There are 2 types of Management primary dysmenorrhea which are pharmacological and non-pharmacological. The treatment for Non-pharmacological can be done with pelvic rocking exercise and Buteyko Exercise. The movements in pelvic rocking exercise and Buteyko Exercise can stimulate the body to release endorphins which function as natural sedative hormones, and can also facilitate blood flow to the uterus so that pain is reduced.

Purpose: The effect of pelvic rocking exercise and Buteyko Exercise on reducing pain in primary dysmenorrhea was The purpose of this research.

Methods: This research is a quantitative study with a quasi-experimental design, pre-test and post-test designs. Nonequivalent control group design. The amount of the sample are 58 people by using purposive sampling technique. The research instrument used a standard operating procedure sheet for pelvic rocking exercise and Buteyko Exercise, a monitoring sheet, a stop watch and a numeric rating scale pain measurement sheet. The hypothesis is tested by using the independent T Test.

Results: Before the intervention, the p-value was 0.063. The results of this research was p value 0.001.

Conclusion: This research can also be used as input for nurses to make new decisions in improving the quality of nursing care with non-pharmacological therapeutic approaches. There is an effect of pelvic rocking exercise and Buteyko Exercise on reducing pain in primary dysmenorrhea. The results of this research can be used as a contribution of thoughts and references as a more in-depth study of pain reduction in primary dysmenorrhea.

Keywords: buteyko exercise; dysmenorrhea; pain level; pelvic rocking exercise.

Introduction

A period of human growth and development after childhood and before adulthood in the age range of 10–19 years is called Adolescence. In the past century, adolescence encompasses elements which have changed of biological growth and major social role transitions. The onset of earlier puberty adolescence in nearly all populations has accelerated, while its continued growth has lifted its endpoint age well into the 20's (Sawyer et al., 2018). A milestone in a woman's life as it denotes the start of reproductive capacity called menarche (Karapanou & Papadimitriou, 2010). The expulsion of the endometrial lining of the uterus following a nearly month long preparation for embryo implantation and pregnancy called menstruation. A functional

OPEN ACCESS

Jurnal Keperawatan Padjadjaran (JKP)

Volume 10(1), 22-26
© The Author(s) 2022
<http://dx.doi.org/10.24198/jkp.v10i1.1938>

Article Info

Received : December 15, 2021
Revised : January 18, 2022
Accepted : January 26, 2022
Published : April 7, 2022

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Citation

Djupri, D.R., Said, I., Irawati, H.R., & Manggabarani, S. (2022). The Effect of Pelvic Rocking Exercise and Buteyko Exercise on Reducing Primary Dysmenorrhea Pain Levels. *Jurnal Keperawatan Padjadjaran*, 10(1), 22-26. <http://dx.doi.org/10.24198/jkp.v10i1.1938>

Website

<http://jkp.fkep.unpad.ac.id/index.php/jkp>

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E-ISSN: 2442-7276
P-ISSN: 2338-5324

Table 1. Characteristics of Respondents by Age (n=58)

Age Category	Frequencies (n)	Percentage (%)
Intervention		
16 years	17	58.6
17 years	12	41.4
Control		
16 years	15	51.7
17 years	14	48.3

Table 2. Analysis of Pain Levels in Primary Dysmenorrhea (n=58)

Pain level	Pre Test		Post Test		SE	P Value
	Mean	SD	Mean	SD		
Intervention	4.05	1.504	1.65	1.309	0.294	0.001*
Control	4.15	1.309	3.25	1.860	0.512	

*paired T Test with $P < 0.05$ is significant

layer, the stratum functionalis, which faces the lumen, and a basal layer beneath it, the stratum basalis in endometrium has changes in response to the monthly endocrine cycle and is shed during menstruation (Yang et al., 2012).

Dysmenorrhea distinguished by Primary and Secondary. Menstrual pain that caused not by pelvic pathology called Primary Dysmenorrhea. Symptoms experienced cramps that are not pathological and this is experienced by 50% of women and can result in decreased quality of life and absenteeism (Dawood, 2006). While in secondary dysmenorrhea, gross pathology is present in the pelvic structures, frequently associated with dyspareunia, dysmenorrhea and chronic pelvic pain (Origoa et al., 2021). Dysmenorrhea is pain during menstruation that many young women feel (Abreu-Sánchez et al., 2020).

Prevalence of dysmenorrhea of Indian female students was 70.2% (Omidvar et al., 2016). Experienced dysmenorrhea pain for one or 1-2 days during menstruation. About 23.2% of the dysmenorrheic girls experienced pain for 2–3 days. Most of Dysmenorrheic and non dysmenorrheic girls during the menstrual periods was tiredness and back pain. Females experiencing of dysmenorrhea could be mild pain, moderate and severe forms of dysmenorrhea respectively. Majority girls 83.2% depended on non-pharmacological methods. Less than depended pharmacological management (25.5%) and 14.2% had sought medical advice (Omidvar et al., 2016).

A woman's quality of life and interfere with daily activities are negatively affect from Dysmenorrhea. Primary dysmenorrhea is increased prostanoids, particularly prostaglandins (PGs). Anaerobic metabolites will stimulate pain receptors, it will happened when The increased PGs, because uterine contractions that restrict blood flow (Ferries-Rowe, Corey, & Archer, 2020). Several non-pharmacological techniques can be used to reduce

pain and have a very low risk, including pelvic rocking exercise and Buteyko Exercise. Cramps and improves associated symptoms because of menstrual can reduce (Mohamed & Hafez, 2017). Pain intensity scores, pain duration, menstrual flow duration can be reducing by pelvic rocking exercise. It can used by adolescent girls who were suffering from moderate to severe primary dysmenorrhea. (Mohamed & Hafez, 2017). Therefore primary dysmenorrhea pain can reduce by using non-pharmacological methods such as pelvic rocking exercise (Mohamed & Hafez, 2017). It happens cause when doing sports, the body will feel relaxed and produce endorphins. Endorphins are hormones that reduce pain produced in the brain and spinal cord. This hormone can also have a natural sedative effect for comfort (Mohamed & Hafez, 2017). While the Buteyko Exercise is one of the breathing exercises in which oxygen is released from the blood more slowly, causing breathlessness, a slow and shallow breathing pattern, which is called "reduced breathing" so that it will help relax the respiratory muscles and make the body more relaxed (Hassan, Riad, & Ahmed, 2012). Management of primary dysmenorrhea can be done with pharmacological and non-pharmacological treatment. Non-pharmacological treatment can be done with pelvic rocking exercise and Buteyko Exercise. Movements in pelvic rocking exercise and Buteyko Exercise can stimulate the body to release endorphins which function as natural sedative hormones, and can also facilitate blood flow to the uterus so that pain is reduced (Hassan et al., 2012).

Methods

This research was conducted at SMK Tirtayasa, Jakarta, after receiving a letter of ethical review approval from Universitas Esa Unggul. This research applied four main principles in the ethics of nursing research, such as respect for human dignity,

respect for privacy and confidentiality, respect for justice, inclusiveness, and balanced harm and benefits. The research design applied was the Quasi-Experimental Design by using the design of pre-test and post-test Nonequivalent control group design. The design of this research used a control group and the first observation (pretest). Next, 58 people from the total sample met the inclusion criteria set by the researcher, such as being able to, and agreed to become respondents by signing a consent form including important information from participants. Chi square is used as sample, with p value 0.001.

The instruments used in this study were as follows: Numeric Rating Scale to measure pain level from 1-10, and a stopwatch to measure execution time. This research activity was carried out at the same time, namely on the 1st day of dysmenorrhea. A pre test was carried out and then intervention was implemented until the 2nd day, per activity session / day for 30 minutes. The post test was carried out on the 2nd day. The analysis used to test the significance of the difference in the mean of the research variables between before and after the intervention was an independent parametric t-test or paired t-test. For statistical tests, the level of significance (significant) used was p 0.05.

Results

The research was conducted at SMK Tirtayasa. There were 2 groups in the study, the intervention and the control.

Table 1 shows intervention group with 29 respondents, 17 people (58.6%) were 16 years old, and 12 people (41.4%) were 17 years old. Control group shows that of the 29 respondents, 15 (51.7%) were 16 years old, and 14 people (48.3%) were 17 years old.

Table 2 shows that before intervention, the average pain level was 4.05. While after intervention, the average was obtained and the pain level was 1.65, it means that the pain was reducing. The average pain level was 4.15 for control group. While after the intervention 3.25. The p value was 0.001, it means there is an effect of Pelvic Rocking Exercise and Buteyko Exercise in reducing the level of primary dysmenorrhea pain.

Discussion

Dysmenorrhea is a normal part of the menstrual cycle based on health professionals, pain researchers, and women themselves. Women with primary dysmenorrhea will reports the impact and consequences of recurrent menstrual pain such as pain sensitivity, mood, quality of life and sleep in (Iacovides, Avidon, & Baker, 2015).

One of the problem that prevalent among adolescent secondary-school girls is dysmenorrhea, it can make school absenteeism and limitations on social and academic activities (Abd El-Mawgod,

Alshaibany, & Al-Anazi, 2016). Health education can be delivered to their students as a topic to prevent dysmenorrhea. It can cooperate with school nurse and school physician (Abd El-Mawgod et al., 2016). Debilitating gynecological condition that affects between 45 and 95% of menstruating women that caused by Primary dysmenorrhea (Iacovides et al., 2015).

One of Various physiological signals is Pain which is subjective feeling, it is a sensation that every human being must have experienced all their life. (i.e., heart activity, brain activity, muscle activity, electrodermal activity, respiratory, blood volume pulse, skin temperature) and behavioral signals are organized for wearable sensors detection (Chen, Abbod, & Shieh, 2021).

Nociception is the neural phenomena of sensory transduction which is identify and the perceptual experience of pain (Moayedi & Davis, 2013). It is a gate that opened by a sensory cue, which will then open a gate between the tube and the brain (Moayedi & Davis, 2013). It will identification pain diagnostic of 3 steps: pain state, pain mechanism, and molecular target (Vardeh, Mannion, & Woolf, 2016).

Prostaglandins as The somatosensory nerves transmit pain signals in a way innervating the inflamed areas experience heightened excitability and generate (Jang, Kim, & Hwang, 2020). The roles of arachidonic acid-derived prostaglandins, particularly in terms afferent nociceptors focusing on prostaglandins and one thromboxane (Jang et al., 2020).

The central nervous system, activation nociceptive nerve endings or fibers implicates generation of action potentials which then travel to and may induce pain sensation (Bradykinin, Peth, & Reeh, 2012). Thermal, mechanical, or chemical stimuli that may be translated to corresponding hyperalgesias increased responsiveness because of sensitization of nociceptors (Bradykinin et al., 2012). Mechanisms sensitizing actions of inflammatory mediators including bradykinin, prostaglandins, thromboxanes, leukotrienes, platelet-activating factor, and nitric oxide on nociceptive primary afferent neurons which supporting data from molecular, cellular, and behavioral models are consistent with findings that reflect properties of peripheral nociceptive nerve endings (Bradykinin et al., 2012).

Pain can be measured using the Numeric Rating Scale method. The numeric rating scale (NRS 0–10; 0, no pain; 1-3 mild; 4-6 moderate; 7-8 severe; 9-10 worst pain imaginable) (Gerbershagen et al., 2011). The level of pain in the intervention group before and after being given pelvic rocking exercise and Buteyko Exercise can decrease because of the intervention that has been given in the form of pelvic rocking exercise and Buteyko Exercise. In addition, respondents also performed pelvic rocking exercise and Buteyko Exercise in accordance with standard operating procedures.

Pelvic rocking exercise and Buteyko Exercise

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are exercises that help in reducing primary dysmenorrhea pain, that make small movements in the pelvis. This exercise can alleviate the release of several neurotransmitters such as endorphins, catechol, production of secretory hormones, suppress prostaglandins, and increase the estrogen-estradiol ratio which acts to reduce endometrial proliferation and blood flow from the uterus (Mohamed & Hafez, 2017).

Pain intensity scores, pain duration, menstrual flow duration who were suffering from primary dysmenorrhea has reduced by Pelvic rocking exercise for adolescent girls. Therefore, one of the non-pharmacological methods to alleviate primary dysmenorrhea is pelvic rocking exercise. Based on the findings, health education program in school carried out non-pharmacological to reduce primary dysmenorrhea such as pelvic rocking exercise (Mohamed & Hafez, 2017). The combination of movements in pelvic rocking exercise and Buteyko Exercise can stimulate the body to release endorphins which function as natural sedative hormones, and can also facilitate blood flow to the uterus so that pain is reduced (Hassan et al., 2012).

Conclusion

The respondents characteristics of this research were that most of 16-17 years. Based on the results of the research, there was a significant correlation between pelvic rocking exercise and Buteyko Exercise in reducing pain in primary dysmenorrhea. The results showed p value 0.001 (p value < 0.05). This means it can reduce pain in primary dysmenorrhea. Most importantly, the results of the research may become the basis that can reduce pain level in primary dysmenorrhea. It can be used as an alternative nursing treatment in reducing pain. However, the procedures for the research should be improved.

This research can be considered in nursing services as a solution in overcoming primary dysmenorrhea. This research can also be used as input for nurses to make new decisions in improving the quality of nursing care with non-pharmacological therapeutic approaches. The results of the study can be used as a contribution of thoughts and references as a more in-depth study of pain reduction in primary dysmenorrhea before and after being given pelvic rocking exercise and Buteyko Exercise so that it can enrich the knowledge, especially in the field of nursing.

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