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EFFECTIVENESS OF DYSMENORHOE GYMNASTIC IMPLEMENTATION USING SMARTPHONE APPLICATION ON DYSMENORHOE SYMPTOMS IN YOUTH

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Abstract

Background *: Dysmenorhoe is a situation where a woman will or are experiencing menstrual pain or cramping in the lower abdomen, the incidence is around 55% in reproductive age, with an incidence of young women (adolescents) as much as 16.8 - 81%, the incidence of dysmenorrhoea occurring in adolescence in West Java as much as 59.9% with a degree of severe pain, having an impact on absenteeism in school 1-3 days, it disrupts learning activities and activities, which in turn disrupt the learning achievement. to reduce complaints dysmenor hoe 51.2% with drug therapy, 24.7% relaxation and 24 , 1% distraction of Gymnastics Dysmenorhoe is an effective alternative to reduce dysmenorhoe for adolescents* ***Objective*** *: To determine the effectiveness of Gymnastics Dysmenorrhea Applications Smartphone of symptoms in adolescents at SMAN 3 Karawang.****Method*** *: This study used the Quasi-Experiment design with the design of the Pretest-Posttest Control Group Design.****Results*** *: the average symptom of dysmenorhoe adolescents who did gymnastics dysmenorhoe was 2.037, whereas for adolescents who did not do gymnastics dysmenorhoe, the average symptom of dysmenorhoe was 4.185. The results of the statistical test obtained a value of p = 0,000, meaning that there were significant differences in the average symptoms of dysmenorhoe between adolescents who did dysmenorhoe gymnastics and those who did not exercise.* ***Conclusion*** *: Gymnastics dysmenorhoe is effective in reducing symptoms of dysmenorhoe*

Keywords: *Gymnastics dysmenorhoe, adolescents, symptoms of dysmenorhoe*

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I. INTRODUCTION

Dysmenorhoe is a condition in which a woman who will or is experiencing menstruation feels pain in her lower abdomen, which is a common gynecological problem [(1)] . The cause is high levels of the hormone prostaglandin which causes uterine contractions. [(2)] According to estimates, the incidence of dysmenorhoe in Indonesia reached 64.25%, with a distribution of 54.89% dysmenorhoe primary and 9.36% dysmenorhoe secondary and 55% productive women.

in Surabaya, the figure was 1.07% to 1.31% of the number of people with dysmenorrhea who came to the obstetrics department [(3)] in the

opinion of Woo and Mc. Eneaney [(4)] states that 40 - 90% of women experience *dysmenorhoe* in which one in thirteen women is absent from work and school for 1-3 days. The results of the CE study Diah and Tinah,[(5)] showed that the incidence of *dysmenorhoe* was 97.5%.

The high incidence of Dysmenorrhea in adolescents was caused by several factors, including age, psychology, support and knowledge. In addition, adolescence is a period of transition from the age of the child to adulthood. At this time there were physical and psychological changes and this was a supporting risk factor for the occurrence of *dysmenorhoe*.

Gymnastics effective alternative to reduce *dysmenorhoe* for teens. Sports or gymnastics is one of the relaxation techniques that can be used to reduce pain, this is because doing sports or body gymnastics will produce endorphins produced in the brain and spinal cord. Endorphin hormones function as natural sedatives, causing a feeling of comfort. (6)

Physical movement is highly recommended to reduce *dysmenorhoe,* one alternative is to do exercise *dysmenorhoe*. The results of the research conducted by Miladiyah Rahmawati, Bekti Juniarti, Mundarti (7) state that there are influences on the scale of pain in adolescents who perform dysmenorhoe exercise. The results of Yuyun Setyorini, Satino's study (8) stated that there was a significant effect on pain intensity between before and after the action (Gymnastics *Dysmenorhoe*), with a p value = 0.000 ($p < 0.05$)

Many factors that led to treatment *dysmenorrhea always* relied on therapy medicine, even though physiologically *dysmenorhoe* is a natural process due to hormonal changes that occur in a woman's body as long as there is no disease of the reproductive organs that accompany it.

At the time of the preliminary survey, information was obtained that the School (SMAN 3 Karawang), had never specifically explained or provided an alternative explanation for reducing *dysmenorrhea* their students, whereas many students complained of *dysmenorhoe* every month from moderate to severe and causing female students it does not go to school. This certainly affects the learning outcomes, because students become not concentrated in receiving lessons before the menstrual cycle. Even though data have not yet been found to decrease the achievement of learning outcomes. The results of interviews conducted on 10 female students in the high school about the prevention of *dysmenorrhea* of which stated that they always consumed analgesic drugs from stalls and the rest said they did not do anything, they only rested at home or in the mosque, because even if they attended school or attended classes, they unable to follow the learning process properly.

One method for reducing symptoms of *dysmenorhoe* is by doing gymnastics *dysmenorhoe*. Gymnastics *dysmenorrhoea* a combination of relaxation and techniques *stretching*, carried out 2-3 days before menstruation, which can produce *endorphin hormone*, the hormone functions as a *sedative* natural causing a sense of comfort and relaxation. According to Rofli Marlinda an increase in hormone *endorphine* can reduce pain. The group of adolescents who did exercise 3 days before the menstrual cycle had decreased *dysmenorhoe* compared to adolescents who did not do gymnastics [(9)]

Along with the advancement of science and technology in the dissemination of information, many alternative media can be chosen to disseminate information to the public, especially teenagers, from simple to sophisticated ones such as *smartphones.*The use of *smartphones* among teenagers is not new. The technology trendsetter survey data (2015) states that the number of use *smartphone* in Indonesia is dominated by adolescents in the age range of 14-17 years, namely 58%. It can be categorized that the use of *smartphones* is not something that is considered foreign to teenagers.

The use of *smartphones* in adolescents is not only limited as a means of communication, but with a variety of applications in it that allows teenagers to access various information that is educational without time limits, this is evidenced by the use of *smartphones* as a learning medium. Using a gadget as a learning medium is an interesting and very easy thing.[(10)] · The effectiveness of application use on *smartphones* in achieving educational goals is evidenced by research conducted by Edy Yunianto and Noorfitriana [(11)] in his research on the Relationship between Smartphone Utilization and Class X Student Learning Outcomes in the Smk N 4 Yogyakarta Expertise Program stating that there is a relationship between application usage *smartphones* with learning outcomes both in knowledge and skill. This is supported by the results of interviews with 10 female students at Karawang High School 3 who stated that *smartphones are* practical and can be used to study anywhere and anytime, and motivate them to find out various information quickly and easily.

The researcher designed a health promotion media for learning in the form of an application on a *smartphone* about gymnastics *dysmenorhoe.*Based on the results of the search conducted by researchers of the alternative implementation gymnastics *dysmenorhoe* that have been implemented limited to the use of the module and guide the implementation of gymnastics *dysmenorhoe* direct and gymnastics implementation guide *dysmenorhoe* in the form of booklets, while the use of technology *smartphone* for combating the symptoms of *dysmenorhoe* gymnastics with *dysmenorhoe* no application.

The hope is that the results of this study can be used as study material to create learning media and health promotion by using applications on *smartphones* which have an impact on decreasing the level of *dysmenorhoe* in adolescents by doing gymnastics *dysmenorhoe*.

Based on the description above, the author is interested in conducting research on the Effectiveness of Gymnastics *Dysmenorrhea Applications Smartphone* Against the Level of *Dysmenorhoe* in Adolescents at SMAN 3 Karawang.

II. METHODS

This study used the *Quasi-Experimental* design with the design of the *Pretest-Posttest Group Design control*

with the following steps:

The first stage of making a gymnastics application training on a *smartphone*

The second stage of the researchers measured the pain scale / screening before treatment) attitude before the intervention (pre test).

Researchers conducted *screening* on the level of pain as a symptom of *dysmenorhoe* in the menstrual cycle last month.

Provide an explanation for the use of smartphones containing gymnastics dysmenorhoe, then make an agreement again to do gymnastics dysmenorrhoea 2 days before menstruation the following month 2 times a day for 10 minutes (for gymnastic procedures can be seen in the attachment). For monitoring the exercise in the smartphone application there is already a schedule for exercising gymnastics, and a rubric on the implementation of gymnastics dysmenorhoe contained in applications smartphone so that respondents only fill in the application and will be monitored through video recording of exercises dysmenorrhoea by respondents to researchers through whatsapp social media every the month immediately after implementation.

After the respondents did gymnastics, for 3 menstrual cycles then the pain intensity measurements of each menstrual cycle were carried out to determine changes in the symptom pain scale. *dysmenorhoe*

The population in this study were all girls who had *dysmenorhoe at* SMAN 3 Karawang, with a sample of 54 respondents for the group treatment and 54 respondents for the control group, **inclusion criteria:**women who have had menstruation and regularly, adolescents who experience 3-10 *dysmenorhoe* with pain scale levels between measured by using the VAS scale in the menstrual cycle in the last 6 months, are willing to be Research subjects, did not use pharmacological therapy such as analgesics during the study, young women who have *a smartphone* Android. **Exclusion criteria: have gynecological** disease or *dysmenorhoe* secondary which can affect the menstrual period.

Data collection was done using a questionnaire and smartphone application containing gymnastic dysmenorhoe, demographic data and characteristics of menstruation. Questionnaires explored demographic data and menstrual characteristics from respondents of the study. From the database, the information obtained was age, while the characteristics of the data obtained were menstruation. *menarche*, when first experiencing *dysmenorhoe*, experience in dealing with *dysmenorhoe, the* form of attention of parents or other families when experiencing *dysmenorhoe* and management on the first day of menstruation in the previous month and the average menstrual cycle, measurement of anxiety level measuring instrument used is HARS (Hamilton Anxiety Rating Scale). The HARS scale is a measure of anxiety based on the appearance of symptoms in individuals who experience anxiety.

According to the HARS scale there are 14 symptoms that appear in individuals who experience anxiety. Each observed item is given 5 levels of score between 0 (Zero Percent) to 4 (severe). The HARS

scale has been proven to have high validity and reliability to measure anxiety in the clinical study *trial* of 0.93 and 0.97. This condition shows that measuring anxiety using the HARS scale will obtain valid and reliable results. The Scale of *anxiety HARS* (*Hamilton Anxiety Rating Scale*) consists of 14 items, the

analysis used in the sample paired with the independent t test used

III. RESULTS

Characteristics of the Respondents

Table 1:. Distribution of Age of *Menarche*

Age of Menarche	Treatment		Group Control Group	
	n	%	n	%
7 years	-	-	1	1,9
8 Years	1	1,9	-	-
9 Years	3	5,6	5	9,3
10 Years	8	14,6	6	11,1
11	23	42,6	19	35,2
12 Years	14	25,9	14	25,9
13 Years	3	5,6	8	14,8
14 Years	2	3,7	1	1,9
Total	54	100	54	100

Based on the table above, the highest age of menarche occurred in age of 11 years as many as 23 respondents (42.6%) in the treatment group and 19 respondents (35.2%) in the control group

Table 2. Menstrual pain Management

pain management	group treatment		control group	
		n%		n%
Rest / Sleep warm water	32	59.3	21 24	38.9

compresses Drugs analgesic	16 6	29.6 1.1	9	44.4 16.7
Total	54	100	54	100

Table 2 shows the handling of menstrual pain carried out by 32 female respondents (59.3%) with how to sleep in the treatment group and 24 respondents (44.4%) to compress the warm water in the control group

Table 3. Support Parents

Support Parental	group treatment		control group	
		n%		n%
Support Not support	30 24	55.6 44.4	25 29	46.3 53, 7
Total	54	100	54	100

Table 3 shows a lot of getting support from parents when experiencing pain as many as 30 respondents (55.4%) in the treatment group and in the control group as many as 29 respondents (53.7%) did not get support from parents.

Table 4: Anxiety

Anxiety in	the Treatment		Groups of the Control Groups	
	n	%	n	**%**
Lightly Moderate Weight	4 42 8	7.4 77.8 14.8	8 38 8	14.8 59.3 25.9

Table 4. Most responden anxiety levels experience anxiety moderate as many as 42 respondents (77.8%) in the treatment group and 38 respondents (59.3%) in the control group.

Table 5: History of the treatment

Reproductive Disorders	Treatment		Group Control Group	
	n	%	n	%
Yes No	- 54	- 100	1 53	1,9 98,1
Total	54	100	54	100

Table 5 shows that in the treatment group 54 respondents (100%) did not have a history of reproductive system disorders. whereas in the control group who get the disorder of the reproductive system as one respondent (1.9%)

Table 6: Level of Pain before in Intervensi

level of pain	group treatment		Control group	
		n%		n%
No pain Mild Moderate Weight Weight once	- 8 34 9	3- 14 ,8 63. 0 16. 7 5,6	49 3 2 -	- 90,7 5,6 3.7 -

Table 6 shows respondents who experienced moderate pain levels before the intervention occurred in the treatment group as many as 34 respondents (63.0%), in the group control experience mild pain levels as much as 49 respondents (90.7%)

Table 7: level of Intervention Pain after

level pain	group treatment		control group	
		n%		n%
No pain	9	16.7	1	1,9
Mild	29	53.7	49	90.7
Moderate	13	24.1	2	3,7
weight	3	5 , 6	2	3,7
weight once	-	-	-	-

Table 7 Showing respondents who experienced pain levels after having no pain intervention in the treatment group as many as 9 respondents (16.7%), in the control group no experiencing menstrual pain as much as 1 respondent (1.9%)

Table 8: Distribution stocking of dysmenorhoe according to behavioral symptoms Average gymnastics dysmenorhoe in SMAN 3 Falkirk Year 2018

Intervention	Mean	SD	SE	P value
-Senam dysmenorhoe	1.579	0.751	0.102	0.000
-Teknik Respiratory	4.185	2.037	0.214	

The mean symptom dysmenorhoe teenagers who do gymnastics dysmenorhoe is 2,037 with a standard deviation of 0,751, whereas for adolescents who did not do gymnastics dysmenorhoe, the average symptom of dysmenorhoe was 4,185 with a standard deviation of 1,579. The results of the statistical test

obtained a value of p = 0,000, meaning that at alpha 5% there was a significant difference in the average symptoms of dysmenorhoe between adolescents who did gymnastics and those who did not exercise.

IV. DISCUSSION

Age of Menarche

Menarche age was the lowest age of 7 years and the highest was 14 years, age of menarche was highest at the age of 11 42.6% in the treatment group and 35.2% in the control group. Halmitol inn Sabhinaya [(12)] stated that dysmenorhoe would gain weight after several years after the first menstruation until the age of 23-27 years later dysmenorrhoea will subside.

Pain management

Pain management non pharmacological, such as warm compresses can relieve ischemia by reducing uterine contractions and launched a blood vessel so that it can relieve pain by reducing tension and increasing feelings of well-being, increase menstrual flow and relieve vasocongestion pelvis [(13)]

Levels of pain

results showed levels pain decreased after teenagers did gymnastics as much as 16.7% did not experience menstrual pain in the treatment group and in the control group 1.9%.

The pain arises not long before or together with the onset of menstruation and lasts for several hours even though in some cases it can last several days. Pain is a seizure, usually limited to the lower abdomen but can spread to the waist and thigh area. Along with pain can be found nausea, vomiting, headache, diarrhea and irritability [(14)].

Menstrual pain (*dysmenorrhea*) can be caused by an imbalance of the hormone progesterone in the blood resulting in pain arising [(3).] Primary dysmenorrhea occurs because the endometrium has a high increase in prostaglandin. Under the influence of progesterone during the luteal menstrual phase, endometrium containing prostaglandin increases to the maximum level on the onset of menstruation. Prostaglandin causes contraction of myometrium which is strong and capable of constricting blood vessels causing ischemia, endometrial disintegration and pain (Morgan & Hamilton, 2009).

Parental support

The results showed support from parents when experiencing menstrual pain as much as 74,% in the treatment group and in the control group as much as 53.7% did not get support from parents. Individuals who experience pain in general often depend on family members or friends close to getting help, support or protection, the presence of a loved one will minimize fear and reduce the pain that is felt [(15)]. This is what underlies the family consciously or not providing support to adolescents who are experiencing dysmenorhoe. Support from mothers and other families is very important for adolescents who are experiencing dysmenorhoe

Anxiety

The results of the study show that the most anxiety level of respondents experienced moderate anxiety as much as 53.7% in the treatment group and 59.3% in the control group. Increased anxiety often increases pain, but pain can also increase feelings of anxiety. It can be concluded that the lower average pain intensity in respondents with mild anxiety is due to the lower anxiety conditions individuals tend to be more stable emotional status and have coping that is more effective against pain. The higher a person's anxiety level is usually the more somatic disorders However, emotionally healthy individuals are usually better able to tolerate pain at moderate to severe levels than individuals who have less stable emotional status[16] The

body reacts when experiencing stress. This stress factor can reduce pain resistance. The first sign that shows a stressful state is the reaction that arises, namely the tightening of the muscles of an individual's body filled with stress hormones that cause blood pressure, heart rate, body temperature, and breathing to increase. On the other hand when stressed, the body will produce adrenaline, estrogen, progesterone and prostaglandin which are excessive. Estrogen can cause an increase in excessive uterine contractions, while progesterone inhibits contraction. This increase in excessive contraction causes pain. In addition, adrenal hormones also increase, causing tense body muscles including the uterine muscles and can make pain during menstruation (Handrawan, 2008)

Exercising the body will be relaxed and the levels of endorphins will be varied among individuals, as well as factors such as anxiety that affects endorphin levels. Individuals with a lot of endorphins will feel less pain. Just as severe physical activity is thought to increase endorphin formation in the descending control system [17]

Gymnastics dysmenorhoe effectiveness in smartphone applications with dysmenorrhea symptoms

The results showed that the average symptom of dysmenorrhea adolescents who did gymnastics dysmenorrhea was 2.037 with a standard deviation of 0.751, whereas for teens who did not do gymnastics dysmenorhoe, the average symptom of dysmenorhoe was 4.185 with a standard deviation of 1.579. The results of the statistical test obtained a value of p = 0,000, meaning that at 5% alpha there was a significant difference in the average symptoms of dysmenorhoe between adolescents who did gymnastics dysmenorhoe with those who did not exercise.

The level of pain before and after menstrual anti-pain exercise in the experimental group the level of dysmenorrhea before menstrual anti-pain exercise in the experimental group most respondents experienced the level of 1st and 4th pain of 26.67%, after menstrual anti-pain exercises in the experimental group most of the respondents experienced the 0th level of pain of 66.67% [10]

The results of this study are in line with the research that has been carried out by Beauty Maumpil, et al (18) which states that the use of gadgets can improve skills in mastering learning.

Rofli Marlinda[9] with exercise *dysmenorhoe* reduces the rate of menstrual pain because exercise or physical exercise is one of the safer non-pharmacological therapies because it uses physiological processes. Exercise can produce endorphine 4-5 times in the blood. Increased levels of endorphine serve as

a sedative with a relaxing effect, giving rise to a sense of comfort. Increased levels of *endorphins* in the body can reduce pain during contractions. *Exercise*/ physical exercise is proven to increase levels of *endorphins* four to five times in the blood, so the more *exercise* the higher the levels of *endorphins* addition to doing exercises regularly 2x a day for 3 days before the scheduled menstrual body will be relaxed so that the brain will stimulate the hypothalamus to produce endorphins, the more exercise / exercise the higher the level of b-endorphin. When someone does exercise / gymnastics, then b-endorphin will come out and be captured by receptors in the hypothalamus and limbic system which functions to regulate emotions. The increase in b-endorphins is closely related to a decrease in pain, the body can create a feeling of comfort and well-being, so that the pain that is felt will decrease. This is in accordance with the research conducted by Hasan Matin Homai1, Fahimeh Sehati Shafai, Ladan Zoodfekr [(10).]

The results of the Kumalasari study[(6)] showed that exercise was *dysmenorhoe* effective in reducing *dysmenorrhea* in adolescents. Research by Miladiyah Rahmawati et al.[(7)] showed changes in the level of pain in the experimental group and the control group. All respondents after doingexercise *dysmenorhoe* experienced a decrease in the level of pain, while in the control group as much as 40% had decreased, the rest there were those who experienced an increase in those who had persistent pain. Rofli Marlinda et al's research [(5)] there was an effect of gymnastics *dysmenorhoe* on the decline of *dysmenorhoe.* Salbiah [(12)] in his study stated that it was found that there was a significant difference between the scale of pain before and after doing abdominal stretching exercises in reducing the scale of pain *dysmenorhoe.*

According to Brayshow (19) gymnastic exercise also aims to improve blood circulation so there is no cramping or pain, because slow circulation will cause cramps or pain, gymnastics dysmenorhoe is also one of the safer to use and preventive pharmacological management.

Teens who do not do gymnastics dysmenorrhea have t count <t table that is 0,000 <1,761, the value of p> alpha is 1,000> 0,005, so it can be concluded that Ho fails to be rejected meaning there is no difference in pain levels before and after in adolescents who do not get gymnastics dysmenorhoe. The condition occurs because the body releases hormones endorphin that can help level the painful menstruation, the hormone serves as a natural morphine in the body and works farmaseutikal outstanding (17)

V. CONCLUSIONS AND RECOMMENDATIONS

Conclusion

Gymnastics dysmenorhoe in android application is effective in reducing the symptoms dysmenorhoe

Suggestion

1 Girls who experience dysmenorhoe can apply dysmenorrhea gymnastics in a smartphone application every cycle routinely 2 days before menstruation 2 times a day for 10 minutes to reduce pain intensity, so that teens feel comfortable during menstruation, learning concentration is not interrupted so that you can improve the quality of life of teenagers for school.

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2. Schools can play an active role in addressing problems in adolescents who experience dysmenorhoe at school, and the use of UK'S is more optimized for adolescents who experience dysmenorrhea

3. For health workers can provide health education especially the reproductive health of young women as early as possible to teenagers, teachers, people old who has teenagers. Gymnastics dysmenorhoe in the smartphone application reduces adolescents in the use of pharmacological therapies in the form of drugs, this application is also very easy to do by adolescents without the need of expert assistance, so that it helps reduce medical expenses, besides education about dysmenorhoe gymnastics can be used as an anticipation for Pre-puberty school-age children for preparation for dysmenorhoe treatment which mugmin appears during puberty.

4. To the next researcher to pay attention to psychological factors that can affect the effectiveness of gymnastics dysmenorhoe examines related reproductive health, especially in adolescents, because adolescents are a transition period and need assistance.

Research needs to be done about other non pharmacological therapies that can be used to treat dysmenorhoe in adolescents.

Competing Interest

The authors of this paper have no competing interest to report**.**

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