

Original Research Article

The Effect of Animated Video and Dysmenorrhea Exercises on Behavioral Changes during Menstruation at Kalukuang II Public Elementary School, Makassar, Indonesia

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ABSTRACT

This study aimed to determine the effect of animated educational videos and dysmenorrhea exercises on behavioral changes during menstruation among students at Kalukuang II Public Elementary School, Makassar, Indonesia. This study addresses the limited research that simultaneously combines animated educational media and dysmenorrhea exercise interventions to improve knowledge, attitudes, and practices (KAP) among elementary school-aged girls. A quantitative approach with a pre-experimental one-group pretest–posttest design was used, involving 38 respondents selected through purposive sampling. However, the absence of a control group limits causal interpretation. Data were analyzed using the Paired T-test. The results showed a significant improvement in respondents' KAP after the intervention ($p < 0.001$). The mean knowledge score increased from 67.05 to 80.26 (mean difference = 13.21), attitudes from 52.42 to 78.39 (mean difference = 25.97), and practices from 45.11 to 79.55 (mean difference = 34.44). Before the intervention, 55.3% of respondents had negative attitudes, while after the intervention 97.4% showed positive attitudes. In terms of practices, 71.1% were categorized as poor before intervention, whereas all respondents (100%) demonstrated good practices afterward. In conclusion, the combined intervention effectively improves menstrual behavior among students.

Keywords: Animation Video Education; Dysmenorrhea Exercise; Menstruation

INTRODUCTION

Biological changes are the first signs seen in adolescent girls, one of which is characterized by the arrival of the first period or menarche or first menstruation (Trisnawati, 2022). Menstruation is a monthly natural process in the reproductive cycle, in which the lining of the uterine wall decays and comes out as blood (Nurfiana et al., 2022). In some cases, women experience disorders such as dysmenorrhea pain in the lower abdomen, and mastodynia or pain during ovulation. Pain level of dysmenorrhea varies, depending on the type (Natalia et al, 2022). Dysmenorrhea is divided into two parts, namely primary dysmenorrhea that are not related to organ abnormalities and are common in adolescents, and secondary dysmenorrhea caused by disorders such as endometriosis and require medical treatment (Gorety et al., 2022).

Globally, adolescents aged 10–19 account for about 16% of the population, with menarche commonly occurring between 12 and 13 years. In Indonesia, most adolescent girls experience menarche around the age of 12, including those in South Sulawesi. Early menarche (before 12 years) has been associated with an increased risk of primary

dysmenorrhea. Furthermore, dysmenorrhea is highly prevalent, affecting approximately 70–90% of adolescent girls worldwide, particularly those aged 9–15. Have a 1.161 times greater risk of developing *dysmenorrhea* compared to those who experienced *Menarche* at the age of ≥ 12 years (World Health Organization, 2022). National data shows that in Indonesia, around 64.25% of adolescent girls experience dysmenorrhea, comprising 54.89% primary dysmenorrhea and 9.36% secondary dysmenorrhea (National Library of Medicine, 2021). In South Sulawesi, the incident of dysmenorrhea is also quite high, with mild pain at 57.7%, moderate pain at 38.5%, and severe pain reaching 3.8% (Ministry of Health, 2022).

Based on preliminary data obtained at Kalukuang II State Elementary School, Makassar, through direct interviews using questionnaires conducted on 15 January 2025, it was found that 12 out of 22 grade IV students had experienced menstruation. Meanwhile, in grade V, 19 out of 23 students interviewed had already experienced menstruation. These data showed that most of the students at this level have already experienced menstruation, so it is important to pay attention to their understanding of various complaints that can arise, one of which is dysmenorrhea.

Most young women generally relieve *dysmenorrhea* in simple ways, such as resting, applying eucalyptus oil, or drinking warm water. Some leave the pain untreated due to lack of information (Mapusa, 2019). These findings indicate that many adolescents lack adequate knowledge of natural and effective ways to cope with dysmenorrhea, which may lead to recurrent pain that interferes with daily activities (Chandrayani et al., 2022). This highlights the need to improve adolescents' understanding of appropriate and healthy strategies for managing and preventing dysmenorrhea. They prefer to rest as the main way to relieve pain. This situation is in line with the theory of behavior according to Notoatmodjo (2022), which explains that behavior is influenced by three main aspects, namely knowledge, attitudes, and practices. Knowledge shapes attitudes, and attitudes influence practices. Lack of knowledge leads to inappropriate attitudes and practices. Therefore, interventions must focus on improving knowledge in order to create healthy attitudes and practices in overcoming dysmenorrhea.

Based on the high prevalence of dysmenorrhea among adolescents, appropriate interventions are needed to improve their ability to manage menstrual pain effectively. Educational interventions play a key role in enhancing adolescents' understanding of dysmenorrhea, including its causes, symptoms, and management strategies (Indrayani et al., 2023; Dolang et al., 2023). Animated educational videos, in particular, have been shown to improve knowledge by presenting information in a more engaging and accessible format (Adhistry, 2023).

Adequate knowledge of how to cope with dysmenorrhea is essential, as it can reduce anxiety and enable adolescents to maintain their daily activities without significant disruption (Nasihah et al., 2022). Improved understanding also supports the development of more adaptive behavioral responses in managing menstrual pain, emphasizing the importance of targeted health education among adolescent girls.

In addition to educational approaches, non-pharmacological interventions such as dysmenorrhea exercises are effective in reducing menstrual pain (Ismarozzi et al., 2022). These exercises help improve blood circulation, reduce muscle tension, and promote natural pain relief when performed regularly (Wulanda et al., 2022). As such, they can support adolescents in developing healthier practices for managing dysmenorrhea symptoms.

Previous studies have demonstrated that animated video-based education can significantly improve adolescents' knowledge about dysmenorrhea (Wulandari et al., 2022; Putri et al., 2023), while dysmenorrhea exercises have also been shown to reduce menstrual pain and improve self-management behaviors (Sumiyati et al., 2023; Pipit Mulyah et al., 2022). However, studies that integrate animated educational videos and dysmenorrhea exercises simultaneously, particularly among elementary school-aged girls, remain limited. Therefore, this study addresses this gap by examining the combined effect of these interventions on adolescents' knowledge, attitudes, and practices (KAP) in managing dysmenorrhea

In addition to education, non-pharmacological interventions such as the gymnastics dysmenorrhea is effective in relieving menstrual pain in adolescent girls. This exercise is effective in reducing menstrual pain complaints if done regularly (Sumiyati et al., 2023). This physical activity, if done regularly, is able to stimulate the release of endorphins that function as natural analgesics, so that menstrual pain can be significantly reduced. Consistency in doing gymnastics *dysmenorrhea* is an important factor in obtaining optimal results (Pipit Mulyah et al, 2022).

Given the high prevalence of dysmenorrhea among adolescent girls and the limited knowledge on effective management, there is a need for appropriate and accessible interventions to improve their ability to cope with menstrual pain. Animated educational videos and dysmenorrhea exercises offer a combined approach that addresses both knowledge and practical skills. Therefore, this study aims to examine the combined effect of animated educational videos and dysmenorrhea exercises on adolescents' knowledge, attitudes, and practices (KAP) in managing dysmenorrhea among students at Kalukuang II Public Elementary School, Makassar, Indonesia.

METHODS

Research Design

This study used a quantitative approach with a pre-experimental method and a one-group pretest–posttest design. The researcher compared students' conditions before and after the intervention to measure behavioral changes. The researcher conducted the study at SDN Kalukuang II, Makassar, from June to July 2024. The researcher provided treatment in the form of animated educational videos and dysmenorrhea exercises during the intervention period (Azhari et al., 2023).

Population and Sample

The population included all female students in grades IV, V, and VI who had experienced menstruation, totaling 60 students. The researcher determined the sample size using the Krejcie and Morgan formula and obtained 38 respondents. The researcher selected respondents using purposive sampling based on specific inclusion criteria. The criteria included female students aged 10–12 years, having experienced menstruation, being in good health, and agreeing to participate in the study.

Research Instruments

The researcher used structured questionnaires to measure knowledge, attitudes, and practices related to dysmenorrhea. The knowledge questionnaire consisted of 12 Yes/No questions, while the attitude and practice questionnaires used a four-point Likert scale (Agustianti et al., 2022). The researcher tested the instrument validity at SD Inpres

Bontomanai, Gowa, and obtained r-count values greater than r-table, indicating valid items. The researcher tested reliability using Cronbach's Alpha and obtained values of 0.678 for knowledge, 0.644 for attitude, and 0.774 for practice, which indicated reliable instruments.

Data Collection Procedures

The researcher collected data in two stages: pretest before the intervention and posttest one month after the intervention. The respondents completed the questionnaires to provide primary data. The researcher collected secondary data from school documents, such as attendance lists and class records, to identify eligible respondents (Adil et al., 2023).

Data Analysis

The researcher processed data through editing, coding, entry, cleaning, and tabulation using SPSS version 25. The researcher performed univariate analysis to describe respondent characteristics, including age, class, and KAP levels. The researcher conducted bivariate analysis using the Shapiro–Wilk test to assess data normality. The researcher used the Paired Sample T-Test or Wilcoxon test to analyze the effect of the intervention on behavioral changes (Waruwu et al., 2024).

Ethical Clearance

Ethical approval for this research was obtained from the designated Research Ethics Committee before the study was implemented. The approval was documented under reference number Rek/039/KEPK-IIKP/VI/2025. The study was conducted in accordance with established ethical standards, with particular attention to informed consent, voluntary participation, participant privacy, confidentiality of data, and the protection of participants' rights throughout the research process.

RESULTS AND DISCUSSION

The respondents consisted of 38 elementary school students from Grades 4, 5, and 6. Most participants were from Grade 5 and Grade 6, indicating that the sample was predominantly composed of students in the upper elementary levels, while Grade 4 students represented a smaller proportion of the respondents.

Table 1. Results of Hospital Waste Quality Testing

Respondent Characteristics	n	%
Classes		
Grade 4	6	15.8
Grade 5	17	44.7
Grade 6	15	39.5
Total	38	100

Based on Table 1, the total number of respondents was 38. Based on grade level, most respondents were in grade 5 elementary school, totaling 17 respondents (44.7%). Meanwhile, 15 respondents (39.5%) were in grade 6, and 6 respondents (15.8%) were in grade 4. This age range is generally associated with the onset of menarche or first menstruation. Early adolescence, which typically begins around the age of 11, is a critical developmental stage characterized by significant physical changes, including the beginning of menstruation. Most

respondents were 11 years old (44.7%), followed by 12 years old (36.8%) and 10 years old (18.4%).

The results of previous study (Hanifah, 2021) showed that the majority of female students who are around 11 years old have experienced menstruation, as shown at Kalisuren 02 State Elementary School, Bogor Regency, where many female students experience menarche at that age. This biological shows that the age of 11 is a common age for girls to experience their first menstruation. Other research conducted by Arifin et al (2020) showed that by the age of about 11, many girls have already experienced their first menstruation or menarche. The age of 11 years is considered a common and important period in the reproductive development of girls, since it is during this time that the body begins to undergo hormonal changes that mark the beginning of the menstrual cycle.

The majority of respondents (44.7%) were in grade 5. The age and level of education in grade 5 of elementary school is an important period because most girls in this group begin to experience menstruation. This biological condition affects significant physical and psychological changes, including the possibility of the appearance of dysmenorrhea. The previous research (Nurlaleli et al., 2021) showed that in upper-class elementary school children (grades IV–VI, ages 10–12 years), the first menstruation often occurs between the ages of 9–12 years. This phenomenon shows that most girls in this age group have entered puberty and experienced menarche.

Other studies conducted by Fadella and Jamaludin (2019) at Prawoto 01 State Elementary School involved female students from grades V and VI. The findings showed that most students in these grades had already experienced their first menstruation (menarche), indicating that the upper elementary school level is a critical period for the onset of menstruation. Furthermore, the study reported that the majority of students who had experienced menarche were around 11 years old. This suggests that early adolescence, particularly between the ages of 10 to 12 years, is a common period for girls to begin menstruation, aligning with developmental theories that identify this stage as a transition phase marked by significant biological and reproductive changes.

Research conducted by Nadirahilah & Fitriyani (2024) who found that the experience of first menstruation was often an inconvenience for adolescent girls. The study results by Malitha (2020) showed that almost half of the 10- to 12-year-old girls had experienced menarche. Thus, this study shows that the majority of respondents are 11 years old (44.7%) and are in the 5th grade of elementary school, which is early adolescence which is biologically the common period of menarche or the first menstruation. Menarche at this age is often accompanied by physical discomfort such as dysmenorrhea, as well as psychological changes that affect behavior.

Comparison of Respondents' Knowledge Levels Before and After Educational Intervention

Table 2 shows the comparison of respondents' knowledge levels before and after the educational intervention using animation videos and dysmenorrhea exercises the comparison of the average results of respondents' knowledge before (pre-test) and after (post-test) educational interventions were given through animation videos and dysmenorrhea exercises. The pre-test was conducted to measure the respondents' initial level of knowledge about dysmenorrhea, while the post-test was conducted after the intervention to assess the extent to which the education provided had improved their understanding about:

Table 2. Respondents' Knowledge Levels Before and After The Intervention

Knowledge Levels	Pre-test		Post-test	
	n	%	n	%
Good	7	18.4	22	70.9
Enough	25	65.8	15	44.8
Less	6	15.8	1	10.8
Total	38	100	38	100

In the pre-test, most respondents were in the moderate knowledge category (65.8%), followed by high knowledge (18.4%) and low knowledge (15.8%). After the intervention, the proportion of respondents in the high knowledge category increased to 70.9%, while the moderate category decreased to 44.8% and the low category decreased to 10.8%. These results indicate an increase in the proportion of respondents in the high knowledge category after the intervention.

This result was in line with research by Lidya Putri et al (2025) which showed that the use of educational media using animated videos could significantly increase adolescents' knowledge about menstruation. Research conducted by Syartina (2023) showed that the researcher provided interventions in the form of health education about dysmenorrhea gymnastics to young women at State Junior High School 11, Jambi City. The health education included providing information about the definition of dysmenorrhea, causes, symptoms, and how to handle it through dysmenorrhea gymnastics.

This result is also supported by Rukmawati (2023) which showed that health education regarding dysmenorrhea pain management has been proven to have a significant influence in increasing the level of knowledge of junior high school students about dysmenorrhea. In this education, a form of non-pharmacological pain management was also introduced, namely dysmenorrhea gymnastics. The introduction of dysmenorrhea gymnastics not only provides an alternative to managing menstrual pain, but also helps increase students' understanding of how to handle dysmenorrhea independently. Thus, the increase in knowledge that occurred in this study can be explained as a result of an educational approach that is in accordance with the age characteristics of the respondents.

Average Overview of Pre-Test and Post-Test Attitudes of Educational Intervention Animation Videos and Dysmenorrhea Exercises

Table 3 presents the comparison of the average results of respondents' attitudes towards dysmenorrhea before (pre-test) and after (post-test) educational interventions are given through animation videos and dysmenorrhea gymnastics.

Table 3. Respondents' Attitudes Before and After The Intervention

Attitude Categories	Pre-test		Post-test	
	n	%	n	%
Positive	17	44.7	37	97.4
Negatives	21	55.3	1	2.6
Total	38	100	38	100

Table 3 shows that most respondents (55.3%) had a negative attitude, while the rest (44.7%) had a positive attitude before the intervention. After intervention using animated videos and dysmenorrhea exercises, there was a change with an increase in positive attitudes in 37 respondents (97.4%) and a decrease in negative attitudes in 1 respondent (2.6%). This negative attitude reflects that before being educated, most respondents did not understand menstruation, managing dysmenorrhea, the causes of dysmenorrhea, and having a positive attitude in dealing with menstruation. After intervention using animated videos and dysmenorrhea gymnastics, there was an increase. The post-test results showed that most respondents had positive attitudes.

This research is in line with the research conducted by Nurhidayah (2024) which showed that education using animated video was not only able to increase the knowledge of adolescent girls, but also had a positive impact on their attitudes in managing menstruation. A study by Suseno et al (2021) also showed that health education through visual media such as health videos can significantly affect attitude changes. A research by Jayanti (2022) showed that through counseling and the practice of dysmenorrhea gymnastics, adolescent girls can reduce menstrual pain and improve their understanding of ways to treat dysmenorrhea independently. This increase in knowledge can contribute to changes in adolescents' attitudes in managing menstrual pain. These findings are reinforced by research by Salamah (2025) which suggests that increased knowledge of adolescent girls about dysmenorrhea and non-pharmacological treatment techniques, such as dysmenorrhea exercises, can change their attitudes towards menstrual pain. Adolescents who have better knowledge tend to have a more positive and proactive attitude in managing menstrual pain independently

Thus, the change in attitudes that occurred in this study is supported by empirical evidence from previous research, that educational interventions with an interactive visual approach are very effective in increasing adolescents' awareness and positive attitudes towards menstruation. The combination of video media and physical activities such as dysmenorrhea gymnastics provides a more well-rounded learning experience, not only adding information but also shaping appropriate emotional and behavioral responses.

Average Overview of Pre-Post and Post-Test practice of Educational Intervention Animation Video and Dysmenorrhea Exercises

Table 4 presents comparison of the average results of respondents' practice in managing dysmenorrhea before (pre-test) and after (post-test) educational interventions are given through animated videos and dysmenorrhea gymnastics.

Table 4. An Average Overview of Pre-Test and Post-Test Practice After Animation Video Intervention And Dysmenorrhea Exercises

Practice Categories	Pre-test		Post-test	
	n	%	n	%
Good	11	28,9	100	100
Poor or Bad	27	71,1	0	0
Total	38	100	38	100

Table 4 shows that in the pre-test, most respondents were in the poor or bad practice category, totaling 27 respondents (71.1%), while 11 respondents (28.9%) were already in the good practice category. The total number of respondents in the pre-test was 38 (100%). After

the intervention using animated video education and dysmenorrhea exercises, all respondents experienced a change in practice category, where 38 respondents (100%) were in the good practice category and none (0%) remained in the poor or bad category. This indicates that before the intervention, the majority of respondents had not yet demonstrated good practices in managing dysmenorrhea, whereas after the intervention, all respondents were categorized as having good practices.

These findings are in line with research by Sumiyati et al (2023) which has proven that structured dysmenorrhea exercise education can improve the ability of adolescent girls to manage menstrual pain independently. A research by Retni et al (2020) showed that providing education with visual media such as animated videos accompanied by physical practices has been proven to be more effective in changing the actions of young women in dealing with dysmenorrhea than just giving lectures or leaflets. This result is reinforced by the findings in the research conducted by Srimulyawati (2025) that regular dysmenorrhea exercise, at least twice a week, has been shown to be effective in reducing the intensity of menstrual pain in adolescent girls.

Differences in respondents' knowledge before and after the intervention

Table 5 shows the differences in respondents' knowledge before and after the intervention using animated video education and dysmenorrhea exercises. The difference was analyzed using the Paired t-test. The results indicate changes in respondents' knowledge levels between the pre-test (before intervention) and post-test (after intervention), reflecting an improvement in understanding of dysmenorrhea after receiving the educational intervention.

Table 5. The Difference Between Respondents' Knowledge Before and After the Intervention

Variable	Average (s.b)	Chelsea (s.b)	95%	Value p
Pre-test knowledge	67.05 (10.96)	13.21(1.77)	8.51-17.91	0.000
Post-test knowledge	80.26 (13.64)			

Based on Table 5, the results of the Paired t-test show that the average respondents' knowledge score before the intervention using animated video education and dysmenorrhea exercises was 67.05 with a standard deviation of 10.96, while after the intervention it increased to 80.26 with a standard deviation of 13.64. The mean difference between pre-test and post-test was 13.21 with a standard error of 1.77. The 95% confidence interval ranged from 8.51 to 17.91, indicating that the increase in knowledge scores was consistently positive. The p-value obtained was 0.000 ($p < 0.05$), which indicates that there was a significant difference in respondents' knowledge before and after the intervention using animated video education and dysmenorrhea exercises. These results show that animated videos and dysmenorrhea exercises had a significant effect on changes in respondents' knowledge about menstruation. This increase in knowledge has an important role as a foundation in forming healthier and more adaptive behaviors during menstruation. Animated educational video was provided in one session, while dysmenorrhea exercises were conducted in two sessions, which together offered a combination of visual learning and practical experience. The use of an animated educational video helps students understand the material in a more engaging and visual way,

while dysmenorrhea exercises provide direct practice in managing menstrual pain independently.

Another showed by Dewi Sari (2023) showed that structured dysmenorrhea gymnastics education could improve adolescents' ability to understand and manage menstrual pain. Research by Mae (2024) also emphasized that visual media such as animated videos were more effective in improving students' understanding because they were interactive and easy to understand. A research by Rukmawati (2023) supported the results of the current study by showing that health education related to dysmenorrhea pain management significantly increases junior high school students' knowledge about dysmenorrhea. Based on the results of Wilcoxon's statistical test, after the educational intervention was given, there was a marked increase in knowledge compared to before the intervention. Thus, the results of this test showed that the combination of animated educational video and dysmenorrhea gymnastics practice was very appropriate to be used as a method to increase knowledge in elementary school-age children in dealing with menstruation when experiencing dysmenorrhea.

Table 6. The Difference Between Respondents' Attitude Before and After the Intervention

Variable	Average (s.b)	Chelsea (s.b)	95%	Value <i>p</i>
<i>Pre-test</i> attitude	52.42 (16.81)	25.97(2.72)	20.15-31.79	0.000
<i>Post-test</i> attitude	78.39 (12.14)			

Differences In Respondents' Attitude Before And After The Intervention

Table 6 shows the differences in respondents' attitudes before and after the intervention using animated educational video and dysmenorrhea exercises. The difference was analyzed using the Paired t-test. The results describe changes in respondents' attitudes between the pre-test (before intervention) and post-test (after intervention), indicating an improvement in attitudes toward dysmenorrhea after receiving the intervention.

Table 6. The Difference Between Respondents' Attitude Before and After The Intervention

Variable	Average (s.b)	Chelsea (s.b)	95%	Value <i>p</i>
<i>Pre-test</i> attitude	52.42 (16.81)	25.97(2.72)	20.15-31.79	0.000
<i>Post-test</i> attitude	78.39 (12.14)			

Based on table 6, the results of the Paired t-test showed that the results of the *pre-test* and *post-test* of the educational intervention of animated videos and dysmenorrhea gymnastics obtained an average attitude of 52.42 with a standard deviation of 16.81. After the intervention of animated educational video and dysmenorrhea gymnastics, the average attitude of the respondents increased from 52.42 to 78.39 with a standard deviation of 12.14. The average difference in respondents' attitudes before and after the educational intervention using animated videos and dysmenorrhea exercises was 25.97 with a standard error of 2.72. The 95% confidence interval is in the range of 20.15 to 31.79, the entire range of the interval is positive, so it can be ensured that there is a consistent improvement in attitude after the intervention. The results of the Paired t-test showed a *p value* obtained of 0.000 (<0.05) which meant that there was a significant difference before and after the intervention using animated video and dysmenorrhea gymnastics. The results showed that animated educational video and dysmenorrhea exercises had significant effects on the changes in respondents' behavior during menstruation at Kalukuang II Public Elementary School, Makassar.

The results of the differential test showed a very significant increase in the attitude score of students after receiving intervention using education through animated videos and dysmenorrhea exercises. The average attitude score increased from 52.42 during the pre-test to 78.39 in the post-test, with an average difference of 25.97 (SD = 2.72). A p-value of 0.000 (<0.05) reinforces that this change is statistically significant. These results showed that educational approaches combined with physical practice had a significant effect on changes in adolescent attitude in dealing with menstruation at Kalukuang II Public Elementary School, Makassar.

These findings are in line with the results of previous research by Patnawati (2023) which proved that video-based education significantly increased the attitudes of adolescent girls regarding the treatment of dysmenorrhea. In addition, research by Wulandari (2022) showed that interventions involving dysmenorrhea exercises were also effective despite their primary focus on pain reduction. In the theory of behavior change according to Aji et al (2022) Changes in individual behavior occur through three main stages: knowledge, attitude, and practice. This process shows that to achieve significant behavior change, a systematic and sustainable approach is needed.

Thus, educational interventions combined with the practice of dysmenorrhea gymnastics through animated video have proven to be effective in increasing adolescents' positive attitudes and behaviors in managing menstruation. A significant increase in attitude scores shows that this approach is able to shape adolescents' awareness and readiness in real terms in dealing with dysmenorrhea. These findings are supported by previous research that confirms the effectiveness of educational media and dysmenorrhea exercises in improving adolescents' knowledge, attitudes, and readiness for menstrual pain management. Therefore, the application of interactive educational methods combined with physical activities such as dysmenorrhea gymnastics is highly recommended as a dysmenorrhea management strategy among elementary and secondary school adolescents.

Differences In Respondents' Practice Before and After The Intervention

Table 7 shows the differences in respondents' practice before and after the intervention using animated educational video and dysmenorrhea exercises. The difference was analyzed using the Paired t-test. The results describe changes in respondents' practice between the pre-test (before intervention) and post-test (after intervention), indicating an improvement in managing dysmenorrhea after receiving the intervention.

Table 7. The Difference Between Respondents' Practice Before and After The Intervention

Variable	Average (s.b)	Chelsea (s.b)	95%	Value p
Pre-test action	45.11 (11.39)	34.44(1.84)	30.13-38.75	0.000
Post-test action	79.55 (11.47)			

Based on Table 7, the results of the Paired t-test showed that the average respondents' practice score before the intervention using animated educational video and dysmenorrhea exercises was 45.11 with a standard deviation of 11.39, while after the intervention it increased to 79.55 with a standard deviation of 11.47. The mean difference between pre-test and post-test was 34.44 with a standard error of 1.84. The 95% confidence interval ranged from 30.13 to 38.75, indicating that the increase in practice scores was consistently positive. The p-value obtained was 0.000 ($p < 0.05$), which indicates that there was a significant difference in

respondents' practice before and after the intervention. The results showed that animated educational video and dysmenorrhea exercises had significant effects on the changes in respondents' practice about menstruation at Kalukuang II Public Elementary School, Makassar.

Based on the results of statistical data analysis, there was a significant increase in respondents' actions in managing dysmenorrhea after being given educational interventions of animated videos and dysmenorrhea gymnastics. Before the intervention, the average actions of the respondents were classified as poor, with a fairly low score. However, after one meeting and two dysmenorrhea gymnastics sessions, the average action increased drastically. A p-value of 0.000 (<0.05) indicates that this increase is statistically significant, which means that the intervention has a real influence on changes in the behavior of students at Kalukuang II Public Elementary School, Makassar in dealing with menstruation. These results showed that students were starting to be able to apply non-pharmacological methods such as doing dysmenorrhea exercises, maintaining a healthy activity pattern, and being more prepared and active in overcoming menstrual pain.

Research by Squirrels (2024) showed that combination of visual methods such as video, animation, and physical activity could form adaptive behaviors that were more effective than verbal education alone. In the theory of behavior change according to Kumoro Aji et al. (2022) Changes in individual behavior occur through three main stages: knowledge, attitude, and practice. This process shows that to achieve significant behavior change, a systematic and sustainable approach is needed. Kumoro Aji also emphasizes the importance of repetition and timing in the process of behavior change, as tangible change cannot be achieved in a short period of time. This is in line with the principle that behavior change takes time and repetition to be observed significantly.

In another theory of behavior change the Transtheoretical Model of Behavior Change (TTM) developed by (Chidya et al., 2024). This theory states that behavior change takes place through five stages, namely precontemplation, contemplation, preparation, action, and maintenance. The "action" stage is the phase in which the individual begins to actively change his or her behavior, and this stage generally lasts for one to six months. This means that within one month, a person can already enter and undergo a phase of real change in their behavior. Thus, the improvement in the actions of Kalukuang II Public Elementary School, Makassar students in managing dysmenorrhea is the result of the appropriate educational approach, which is combining visually appealing information with applicable dysmenorrhea gymnastics.

CONCLUSION

Education through attractive visual media (animated videos) and simple physical activities (dysmenorrhea gymnastics) has been proven to be effective in improving students' knowledge, attitudes, and practice towards menstrual management in a healthy and adaptive manner, including in recognizing signs of dysmenorrhea and applying non-pharmacological methods to reduce menstrual pain. The results of this study also provide recommendations for various parties. For elementary school students or early adolescents, it is hoped that they will be more open in understanding and maintaining reproductive health through fun and interactive educational activities. For future researchers, it is recommended to develop more innovative educational methods involving a larger sample, longer duration of interventions, and considering the social factors, family support, and psychological aspects of the child.

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