International Journal of Advanced Health Science and Technology
Multidisciplinary: Rapid Review: Open Access Journal e-ISSN:2808-6422; p-ISSN:2829-3037

RESEARCH ARTICLE OPEN ACCESS
Manuscript received Mei 05, 2025; revised May 08, 2025; accepted May 10, 2025; date of publication June 01, 2025
Digital Object Identifier (DOI): https://doi.org/10.35882/ijahst.v5i3.467

How to cite: Nurmalaya Farzana Silmi, Minarti, Sari Luthfiyah, and Joko Suwito, "The Effect of Dysmenorrhea Exercise and Warm Compress with Warm water zak on Reducing the Intensity of Dysmenorrhea Pain", International Journal of Advanced Health Science and Technology, vol. 5, no. 3, pp. 164-171, June 2025

The Effect of Dysmenorrhea Exercise and Warm Compress with Warm water zak on Reducing the Intensity of Dysmenorrhea Pain

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ABSTRACT A common problem experienced by almost all women of childbearing age is dysmenorrhea. This is caused by hormonal changes as well as factors such as unhealthy lifestyle, smoking, and family history. The conjunction of dysmenorrhea gymnastics and warm compresses has been demonstrated to effectively reduce the intensity of pain. This study seeks to investigate the impact of the combination of dysmenorrhea gymnastics and warm compresses alongside Warm Water Zak (WWZ) on alleviating the intensity of dysmenorrhea pain among level 4 students enrolled in the Bachelor of Applied Nursing program. The research methodology employed was quasi-experimental, utilizing a pretest-posttest design paired with a nonequivalent control group design. Sampling was conducted through probability sampling, specifically employing the simple random sampling method, resulting in a total of 32 samples distributed across four groups. The research instruments utilized included a Numeric Rating Scale (NRS) pain questionnaire, Standard Operating Procedures (SOP) for dysmenorrhea gymnastics and warm compresses with WWZ, observation sheets, and informational leaflets. Statistical assessment of normality was performed using the Shapiro-Wilk test. Multivariate analysis was performed using the One-Way ANOVA test and Bonferroni post hoc test. The One-Way ANOVA test results showed a significance value of 0.000 which is smaller than 0.050. Bonferroni post hoc test results showed significant differences ($p < 0.05$) in several groups. This study showed that the combination of dysmenorrhea exercises and warm compresses using warm water zak (WWZ) significantly reduced the intensity of dysmenorrhea pain, with a p value <0.05, indicating the effectiveness of this combination of interventions.

INDEX TERMS: dysmenorrhea gymnastics; warm compresses; warm water zak (WWZ); pain intensity; student.

I. INTRODUCTION

Menstruation experienced by teenagers can cause problems if not handled properly [1]. The problem that arises during menstruation that is suffered by almost all women of childbearing age in the world is menstrual pain (Dysmenorrhea) [2].

The World Health Organization (WHO) reports that 90% of the population, or 1,769,425 persons, had dysmenorrhea, and 10% to 15% of them experience Dysmenorrhea severe activity, resulting in limited activities complained about by 15% of adolescent girls who experienced Dysmenorrhea. The average incidence of dysmenorrhea among young women ranges from 16.8% to 81%. Reports from the United Kingdom indicate that between 45% and 97% of women experience symptoms of dysmenorrhea. Bulgaria recorded the lowest prevalence at 8.8%, while Finland exhibited the highest prevalence at 94% [3]. The prevalence of dysmenorrhea in Indonesia is documented at 107,673 individuals (64.25%), with 54.89% categorized as primary dysmenorrhea and 9.36% as secondary dysmenorrhea. Furthermore, in Surabaya, 1.07% to 1.31% of the visits to the obstetrics department were attributed to patients experiencing dysmenorrhea [1].

Dysmenorrhea may be attributed to various factors including irregular menstrual cycles, tobacco use, breakfast consumption patterns, sleep quality, excessive sugar intake, an unhealthy lifestyle, and a familial predisposition to experiencing dysmenorrhea [4]. Dysmenorrhea can cause lower abdominal cramps that feel like stabbing or dull pain [5].

Efforts to reduce the intensity Dysmenorrhea Both pharmacological and non-pharmacological approaches can be used. Pharmacologically using anti-pain medications, while non-pharmacologically with warm water compresses, hypnotherapy, gymnastics, and relaxing Distraction, yoga, mass, and dysmenorrhea [6]. Menstrual pain can be overcome with sports such as gymnastics Dysmenorrhea Because it can enhance blood circulation to the muscles surrounding the uterus, thereby reducing dysmenorrhea [1]. Research conducted by [7] states the application of warm water compresses may also function as a viable alternative non-pharmacological therapy for management purposes.

In light of the aforementioned background, the researcher is poised to undertake a study entitled "The Effect of the Combination of Dysmenorrhea Gymnastics and Warm Compresses with Warm Water Zak (WWZ) on Reducing the Intensity of Dysmenorrhea Pain in Level 4 Students of Applied Nursing Bachelor".

II. METHODS

This study employs a quasi-experimental methodology utilizing a pretest-posttest research design in conjunction with a nonequivalent control group. The population for this investigation comprises 45 Bachelor of Applied Nursing students who experience dysmenorrhea. The sample size was calculated using Federer's formula, resulting in a total of 32 female participants meeting the inclusion criteria: they are Level 4 students pursuing a Bachelor of Applied Nursing and exhibit primary dysmenorrhea, as well as having no history of asthma or heart conditions disease. The sampling technique in this study used probability sampling with the simple random sampling method.

A total of 32 female students who met the inclusion criteria were randomly divided into four groups consisting of 8 female students each. The first group (K1) was given treatment in the form of dysmenorrhea gymnastics, the second group (K2) was given treatment in the form of warm compresses with Warm Water Zack (WWZ), and the third group (K3) was given a combination of dysmenorrhea gymnastics treatment and warm compresses with Warm Water Zack (WWZ). Meanwhile, the fourth group (K4) acted as a control group and was only given leaflets.

This research was conducted between January 2025 and February 2025 within the Nursing Study Program of the Applied Undergraduate Program at the Department of Nursing, Ministry of Health of Surabaya, located at Jl. Mayjend Prof. Dr. Moestopo No. 8 C, Surabaya. The independent variables of this study include gymnastics for Dysmenorrhea, warm compresses, and a combination of gymnastics for Dysmenorrhea and warm compresses with WWZ warm compresses [8]. Meanwhile, the dependent variable in this study is a decrease in pain intensity Dysmenorrhea [8]. The instrument used in this study was a pain questionnaire Numeric Rating Scale (NRS), Gymnastics SOP Dysmenorrhea and warm compresses with Hot Water Bag (WWZ), Observation sheets, and Leaflets.

Data collection was conducted on two occasions, specifically prior to the intervention (pretest) and subsequent to the intervention (posttest). This process employed an instrument designed as a pain level questionnaire, utilizing the Numeric Rating Scale for assessment. The dysmenorrhea gymnastics intervention group was given treatment three times a week before menstruation for 30 minutes. The warm compress intervention group with warm water zak (WWZ) was given two treatments, namely during the first and second days of menstruation. The intervention group in combination with dysmenorrhea gymnastics and warm compresses with WWZ was given dysmenorrhea gymnastics treatment three times a week before menstruation for 30 minutes and warm compresses with warm water zak (WWZ) twice, namely during the first and second days of menstruation. Meanwhile, the control group only got leaflets. The control group was not given any intervention, only receiving a leaflet containing information related to menstrual pain. After all interventions were carried out according to the schedule of each group, data collection was carried out again (posttest) to evaluate changes in the level of dysmenorrhea pain.

The statistical analysis in this study began with a normality test using the Shapiro-Wilk to find out the distribution of data in each group. Furthermore, a homogeneity test was carried out to test the similarity of variance between groups. To analyze the effectiveness of each intervention on the intensity of menstrual pain simultaneously in all four groups, a test was used One-Way ANOVA (Analysis of Variance). If the ANOVA results show a significant difference (H_0 is rejected), then the analysis is continued with the test post hoc Bonferroni to identify meaningful group pairs and determine the most effective interventions [9].

III. RESULTS

The aim of this study was to investigate the impact of integrating dysmenorrhea gymnastics and warm compresses

with warm water zak (WWZ) on alleviating the severity of dysmenorrhea.

A. CHARACTERISTICS OF RESPONDENTS

TABLE 1
Characteristics of Female Students

Characteristic	K1		K2		K3		K4	
	f	%	f	%	f	%	f	%
Age								
21 years old	6	75	3	37.5	6	75	4	50
22 years old	1	12.5	5	62.5	2	25	3	37.5
23 years old	1	12.5	0	0	0	0	1	12.5
Menarche Age								
12 years	4	50	4	50	2	25	4	50
13 years	3	37.5	3	37.5	1	12.5	3	37.5
14 years	1	12.5	1	12.5	5	62.5	1	12.5
IMT								
Low	0	0	3	37.5	0	0	1	12.5
Ideal	7	87.5	5	62.5	6	75	2	25
Excess	1	12.5	0	0	2	25	4	50
Obesity	0	0	0	0	0	0	1	12.5
Menstrual cycle								
Orderly	8	100	8	100	6	75	7	87.5
Irregular	0	0	0	0	2	25	1	12.5
Bleeding								
Usual	7	87.5	8	100	8	100	8	100
Abnormal	1	12.5	0	0	0	0	0	0
Sport								
Orderly	3	37.5	1	12.5	1	12.5	1	12.5
Irregular	5	62.5	7	87.5	7	87.5	7	87.5
Family history of dysmenorrhea								
Yes	6	75	5	62.5	5	62.5	4	50
Not	2	25	3	37.5	3	37.5	4	50
Pain management								
Rest	2	25	4	50	4	50	1	12.5
Sleep	3	37.5	0	0	3	37,5	1	12.5
Taking Medication	1	12.5	2	25	1	12,5	2	25
Warm compresses	2	25	1	12.5	0	0	2	25
None	0	0	1	12.5	0	0	2	25

Based on the distribution of characteristics in TABLE 1, it was found that the age of most female students in the dysmenorrhea (K1) and combination (K3) groups was 21 years old (75% each). In the warm compress (K2) group, most were 22 years old (62.5%), while in the control group (K4), half were 21 years old (50%). The analysis of menarche onset among the K1 and K2 cohorts revealed that 50% of the participants experienced menarche at the age of 12 years. In contrast, the K3 group exhibited a significant majority, 62.5%, who attained menarche at the age of 14 years. Furthermore, within the K4 group, an equal proportion of participants, 50%, also reached menarche at 14 years of age.

The Body Mass Index (BMI) in the K1 group showed that almost all female students had an ideal BMI (87.5%), followed by the K3 group with most of the ideal BMI (75%), K2 most (62.5%), while in the control group (K4), half had an excess BMI (50%). Menstrual cycles were entirely regular in the K1 and K2 groups (100%), mostly regular in the K3 group (75%), and almost entirely regular in the control group (K4) by 87.5%. Bleeding during menstruation showed that almost all female students in the K1 group experienced normal bleeding (87.5%), while all female students in the K2, K3, and K4 groups experienced normal bleeding (100%). Exercise habits were mostly irregular in the K1 group (62.5%), and almost entirely irregular in the K2, K3, and K4 groups (87.5% each).

Family history of dysmenorrhea was found in most female students in the K1 group (75%), as well as in the K2 and K3 groups (62.5% each), while in the control group (K4), half had a family history (50%). Meanwhile, pain management strategies showed that in the K1 group, almost half chose to sleep (37.5%), while in the K2 and K3 groups, half chose to rest (50% each). In the control group (K4), a small percentage of female students handled it by taking medication, warm compresses, or not handling at all (25% each)

B. RESULTS OF STATISTICAL TESTS

TABLE 2
Distribution of *Dysmenorrhea* Pain Intensity Frequency Before and After *Dysmenorrhea Exercises*

Treatment Groups	Pain Scale	*Pre-test*		*Post-test*	
		F	%	F	%
Dysmenorrhea *gymnastics*	No Pain	0	0%	0	0%
	Mild Pain	1	12,5%	6	75%
	moderate pain	5	62,5%	2	25%
	Severe Pain	2	25%	0	0%
Sum		8	100%	8	100%

Based on TABLE 2, the results were obtained that before dysmenorrhea exercises, most of the female students experienced moderate pain as many as 5 female students (62.5%) and a small number, namely 1 female student (12.5%) experienced mild pain. However, following the administration of dysmenorrhea exercises, an assessment of pain intensity revealed a notable increase in reported symptoms. Specifically, it was found that a minority of female students—two individuals (25%)—experienced moderate dysmenorrhea pain, while the majority, comprising six female students (75%), reported mild pain.

TABLE 3
Distribution of *Dysmenorrhea* Pain Intensity Frequency Before and After Warm Compresses with *Warm Water Zak (WWZ)*

Treatment Groups	Pain Scale	*Pre-test*		*Post-test*	
		F	%	F	%
Warm compresses with WWZ	No pain	0	0%	0	0%
	Mild pain	1	12,5%	5	62,5%
	Moderate pain	4	50%	3	37,5%
	Severe pain	3	37,5%	0	0%
Sum		8	100%	8	100%

Based on TABLE 3, the results were obtained that before warm compresses with Warm Water Zak (WWZ), half of the female students experienced moderate pain as many as 4

female students (50%) and almost half, namely 3 female students (37.5%) experienced severe pain. Following the application of a warm compress using Warm Water Zak (WWZ) to alleviate dysmenorrhea, the results indicated an increase in reported pain levels. Specifically, the data revealed that a majority of female students, totaling five (62.5%), experienced mild pain, while none (0%) reported severe pain.

TABLE 4
Distribution of *Dysmenorrhea* Pain Intensity Frequency Before and After *Dysmenorrhea* Gymnastics and Warm Compresses with *Warm Water Zak (WWZ)*

Treatment Groups	Pain Scale	*Pre-test*		*Post-test*	
		F	%	F	%
A combination of *dysmenorrhea* and warm compresses with WWZ	No Pain	0	0%	2	25%
	Mild Pain	1	12,5%	6	75%
	moderate pain	5	62,5%	0	0%
	Severe Pain	2	25%	0	0%
Sum		8	100%	8	100%

Based on TABLE 4, the results indicated that prior to the application of dysmenorrhea gymnastics combined with warm compresses using Warm Water Zak (WWZ), a majority of female students reported experiencing moderate pain, specifically 5 students (62.5%). Additionally, a smaller segment, comprising 2 students (25%), reported severe pain. In contrast, following the integration of dysmenorrhea gymnastics and warm compresses with Warm Water Zak (WWZ), there was a notable improvement; the data revealed that a minority of female students, specifically 2 students (25%), experienced no pain, while a further 6 students reported mild pain (75%).

TABLE 5
Distribution of *Dysmenorrhea Pain Intensity* Frequency Before and After Leaflet Distribution in the Control Group

Control Group	Pain Scale	*Pre-test*		*Post-test*	
		F	%	F	%
Control by leaflet administration	No Pain	0	0%	0	0%
	Mild Pain	1	12,5%	2	25%
	moderate pain	7	87,5%	6	75%
	Severe Pain	0	0%	0	0%
Sum		8	100%	8	100%

Based on TABLE 5, the results were obtained that before being given leaflets to the control group, almost all 7 female students (87.5%) experienced moderate pain and it was obtained that 1 female student (12.5%) experienced pain with a mild pain scale. However, after giving leaflets to the control group on the intensity of dysmenorrhea pain, it showed that there was a slight increase which showed that most of the female students, most of whom were 6 female students (75%) who experienced moderate pain and as many as a small part, namely 2 female students (25%) experienced mild pain.

TABLE 6
Normality Test of Difference in Intensity of Dysmenorrhea Pain

Group	n	Sig. *Pretest*	Sig. *Post test*
Dysmenorrhea gymnastics group (K1)	8	0.975	0.534
Warm compress group with *WWZ* (K2)	8	0.140	0.512
Dysmenorrhea *and warm compress* combination group with *WWZ* (K3)	8	0.840	0.067
Control Group (K4)	8	0.197	0.274

TABLE 7
Homogeneity Test for Pain Intensity Differences *in Dysmenorrhea*

	Living Statistic	df1	df2	Sig.
Pre-test *Pain Scale*	0.420	3	28	0.740
Post-Test Pain Scale	0.904	3	28	0.452

TABLE 8
One-Way *Anova Test Results*

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	45.750	3	15.250	11.311	.000
Within Groups	37.750	28	1.348		
Total	83.500	31			

TABLE 9
Bonferroni's Post Hoc *Further Test*

(i) Group	(J) Group	Mean Difference (I-J)	Sig.
K1	K2	0.125	1.000
	K3	1.875*	0.019
	K4	-1.500	0.092
K2	K1	-0.125	1.000
	K3	1.750*	0.033
	K4	-1.625	0.055
K3	K1	-1,875*	0.019
	K2	-1,750*	0.033
	K4	-3,375*	0.000
K4	K1	1.500	0.092
	K2	1.625	0.055
	K3	3.375*	0.000

Because the number of respondents in this study was less than 50, the Shapiro-Wilk test was used to test the normality of the data. Based on TABLE 6, It was observed that the significance values derived from the pretest and posttest data in each group exhibited a p-value greater than 0.05. This suggests that the data is distributed normally. Meanwhile, based on TABLE 7, According to the results of the homogeneity test, the significance value (Asymp. Sig) during the pretest was found to be 0.740, which is greater than 0.05. Similarly, the significance value during the posttest was 0.452, also exceeding 0.05. Consequently, it can be inferred that the data derived from the pretest and posttest are.

To analyze the variables that had the greatest impact on the severity of menstrual pain in the four groups, a One-Way ANOVA test was conducted. Based on the results of the One-

Way ANOVA test in TABLE 8, Sig. value of 0.000 < 0.050 was obtained so that H_0 was rejected. This indicates a substantial difference in the degree of dysmenorrhea pain before and after the control group received leaflets, dysmenorrhea exercises, warm compresses with Warm Water Zak (WWZ), and a combination of dysmenorrhea gymnastics and warm compresses with WWZ. A significance value smaller than 0.05 implies that there is at least one pair of groups that has a significant mean difference.

Based on the results of the analysis in TABLE 9, the K_3 group (a combination of dysmenorrhea and warm compresses with WWZ) proved to be the most effective therapy in reducing dysmenorrhea pain. This can be seen from the lowest post-test average (1,125) and the results of statistical tests that showed significant differences ($p < 0.050$) compared to other groups, namely K_1 (dysmenorrhea gymnastics), K2 (warm compresses with WWZ), and K4 (control). Meanwhile, the K_1 (dysmenorrhea exercises) and K_2 (warm compresses with WWZ) groups were also effective in reducing dysmenorrhea pain, but not as effective as K_3. The group that received warm compresses with WWZ (K3) and dysmenorrhea gymnastics treatment was the most successful in lowering the severity of dysmenorrhea discomfort, according to the study's overall findings. Thus, it can be inferred that the combination of dysmenorrhea gymnastics and warm compresses with WWZ has an impact on lowering the severity of dysmenorrhea discomfort in Level 4 Bachelor of Applied Nursing studentsThe group that received warm compresses with WWZ (K3) and dysmenorrhea gymnastics treatment was the most successful in lowering the severity of dysmenorrhea discomfort, according to the study's overall findings. Thus, it can be inferred that the combination of dysmenorrhea gymnastics and warm compresses with WWZ has an impact on lowering the severity of dysmenorrhea discomfort in Level 4 Bachelor of Applied Nursing students.

IV. DISCUSSION

A. INTENSITY OF DYSMENORRHEA PAIN BEFORE AND AFTER DYSMENORRHEA EXERCISES

An analysis of the research data indicated that prior to participating in gymnastics, a significant proportion of female students experienced dysmenorrhea characterized by moderate pain, with five female students (62.5%) reporting this condition. Additionally, it was found that only one female student (12.5%) experienced mild pain. The findings of this study align with the results of previous research [10] who said that before dysmenorrhea gymnastics most female students experienced moderate pain (50%) and after dysmenorrhea gymnastics female students experienced mild pain (52%). This research is also in line with [1] that indicates that the pain associated with dysmenorrhea among students of SMPN 20 Gresik, prior to the implementation of dysmenorrhea exercises, was categorized as moderate. Following the intervention of dysmenorrhea exercises, the average pain level was subsequently classified as mild pain.

Based on the findings of the conducted research, it is evident that the intensity of dysmenorrhea pain following dysmenorrhea exercises indicates an increase. Specifically, a minority of female students experience pain classified within a moderate pain scale, with two female students (25%) reporting this level of discomfort, while a larger cohort of six female students (75%) experiences pain categorized as mild scale. This shows that the intensity of dysmenorrhea pain for female students after dysmenorrhea exercises has decreased from before.

B. INTENSITY OF DYSMENORRHEA PAIN BEFORE AND AFTER WARM COMPRESSES WITH WARM WATER ZAK

Based on the analysis of the research data, the results indicate that prior to the application of a warm compress using a Hot Water Bag (WWZ), half of the female students experienced moderate pain, represented by four female students (50%). Additionally, it was found that three female students (37.5%) experienced severe pain. These findings are consistent with the research [11] which showed that the pain felt by more than a few female students before being given a 15-minute intervention was moderate pain (62.5%) and only 1 female student with mild pain (12.5%). The results of this study are also in line with the research [12] who stated that of the 15 female students, the pain scale before the warm compress therapy was carried out with WWZ (Hot Water Zack) With a scale of 4-6 (moderate pain) as many as 5 female students (33.33%) and a pain scale with 7-10 (severe pain) as many as 10 female students (66.66%).

Based on the results of the conducted research, it is evident that following the application of a warm compress using a Hot Water Bag (WWZ), there was an observed increase in pain intensity related to Dysmenorrhea. The findings indicate that the majority of female students experienced pain at a mild level, with 5 students (62.5%) reporting such levels. Notably, it was found that none of the female students (0%) experienced pain classified as severe. The results of this study align with prior research [13] who stated that after female students were given warm compresses, 42 female students (56.8%) experienced mild pain, 24 female students (32.4%) experienced moderate pain, and 8 female students (10.8%) experienced severe pain. Based on this data, the researcher concluded that after being given warm compresses, most of the female students who experienced Dysmenorrhea is in the category of mild pain. This is in line with research conducted by [14], which states

that after a warm compress was carried out, the most female students with a mild pain intensity of 63.3%. The decrease in pain is caused by the conduction of heat transfer from the heat bulge into the abdomen which improves blood circulation and reduces muscle tension.

C. INTENSITY OF DYSMENORRHEA PAIN BEFORE AND AFTER A COMBINATION OF DYSMENORRHEA EXERCISES AND WARM COMPRESSES WITH WARM WATER ZAK

Based on the analysis of research data, the results were obtained that before the combination of dysmenorrhea gymnastics and warm compresses with Warm Water Zak (WWZ), most female students experienced pain with a moderate pain scale as many as 5 female students (62.5%) and it was obtained that 2 female students (25%) experienced pain with a severe pain scale.

Gymnastics Combinations Dysmenorrhea with warm compresses with WWZ (Hot Water Zack) can be used as a non-pharmacological treatment or rehabilitation phase to reduce pain and is considered very effective in reducing pain [15]. Use of gymnastics combinations Dysmenorrhea Warm compresses can result in dilation of blood vessels, which ultimately increases blood flow to those tissues. This can optimize the delivery of essential substances such as acids and nutrients to the cells, while improving the waste removal process, thereby reducing the discomfort caused by primary menstrual pain, which is often caused by a lack of blood supply to the inner lining of the uterus [16].

According to the findings of the conducted research, it is evident that the intensity of dysmenorrhea pain following the implementation of a combination of dysmenorrhea gymnastics and warm compresses using Warm Water Zak (WWZ) reveals a significant improvement. Notably, none of the female students (0%) reported experiencing pain at a severe level. Furthermore, two female students (25%) reported having no pain, while six female students (75%) experienced mild pain. This indicates that the intensity of dysmenorrhea pain among female students has improved as a result of the aforementioned combination of treatments before.

This research is in line with research [6] Gymnastics Dysmenorrhea was carried out before menstruation and in this study it was carried out during menstruation. Warm water compresses were carried out the same at the beginning of menstruation which showed that before the intervention was given, the number of adolescents with mild pain was 22.7%, moderate pain was 50%, and severe pain was 27.3%. After being given an intervention with a warm compress, it showed a change in pain in adolescents with categorically no pain 31.8%, mild pain 63.6% and moderate pain 4.6%. In this study, both therapies are equally effective in reducing menstrual pain, so it can be concluded that in the treatment to reduce the intensity of menstrual pain, it can be done with a combination of dysmenorrhea exercises and with Hot Water Bag (WWZ).

D. DYSMENORRHEA PAIN INTENSITY BEFORE AND AFTER LEAFLET ADMINISTRATION IN THE CONTROL GROUP

Based on the analysis of research data, the results were obtained that before being given leaflets to the control group, almost all female students experienced pain with a moderate pain scale as many as 7 female students (87.5%) and it was obtained that 1 female student (12.5%) experienced pain with a mild pain scale. The research is in line with the research [17] who stated that the value of the female student's pain scale before being given leaflet media health education was in the range of 1-8. The students with the most pain scales were 14 female students (42.4%), 6 female students (18.2%), 3 as many as 3 female students (9.1%), 4 as many as 1 female student (3.0%), 5 as many as 1 female student (3.0%), 6 as many as 5 female students (15.2%), 7 as many as 1 female student (3.0%), 8 as many as 2 female students (6.1%).

Based on the results of the conducted research, it is evident that the intensity of dysmenorrhea pain among the control group, after receiving informational leaflets, indicates a slight increase. This finding reveals that the majority of female students, specifically 6 out of 8 (75%), experience pain classified as moderate on the pain scale, whereas 2 female students (25%) report mild pain. Consequently, this observation suggests that the intensity of dysmenorrhea pain among female students in the control group has experienced a slight increase after the distribution of the leaflets before.

The research is in line with the research conducted [18] which stated that the level of pain before being given Online Education in the experimental group experienced severe pain as much as 40 people (56.3%) while in the control group the majority of female students experienced moderate pain 37 people (52.1%) and after being given education through lefleat experienced a decrease in dysmenorrhea pain by one level of 22 people (30.98%), two levels of 8 people (11.26%), three levels of 4 people (5.63%), four levels of 1 person (1.4%). The results of the study showed that there was a reduction in the pain scale by providing lefleate education had a great impact on reducing dysmenorrhea pain. [19]

E. ANALYSIS OF DIFFERENCES IN DYSMENORRHEA PAIN INTENSITY BEFORE AND AFTER

DYSMENORRHEA GYMNASTICS, WARM COMPRESSES WITH WARM WATER ZAK (WWZ), COMBINATION OF DYSMENORRHEA GYMNASTICS AND WARM COMPRESSES WITH WARM WATER ZAK (WWZ), AND LEAFLETS WERE GIVEN TO THE CONTROL GROUP

Based on the analysis of research data, the homogeneity test obtained showed the value of Asymp. Sig before dysmenorrhea gymnastics, warm compresses with Warm Water Zak (WWZ), combination of dysmenorrhea gymnastics and warm compresses with Warm Water Zak (WWZ), and given leaflets to the control group was 0.740 > 0.05 and an Asymp value. After dysmenorrhea gymnastics, warm compresses with Warm Water Zak (WWZ), combination of dysmenorrhea gymnastics and warm compresses with Warm Water Zak (WWZ), and leaflets given to the control group were 0.452 > 0.05, it can be concluded that the Pretest and Post test data were homogeneous.

While the results of the One Way Anova test were obtained that in the post-test a Sig. value of 0.000 < 0.05 was obtained, so it can be concluded that there is a significant difference between the difference in dysmenorrhea pain intensity before and after dysmenorrhea gymnastics, warm compresses with Warm Water Zak (WWZ), a combination of dysmenorrhea gymnastics and warm compresses with Warm Water Zak (WWZ), and a leaflet was given to the control group.

In the post hoc test of banferroni, the results of the $K_{3\ group}$ (a combination of dysmenorrhea gymnastics and warm compresses with WWZ) proved to be the most effective therapy in reducing dysmenorrhea pain. This can be seen from the lowest post-test average (1,125) and the results of statistical tests that showed significant differences ($p < 0.050$) compared to other groups, namely K_1 (dysmenorrhea gymnastics), K2 (warm compresses with WWZ), and K4 (control). Meanwhile, the K_1 (dysmenorrhea exercises) and K_2 (warm compresses with WWZ) groups were also effective in reducing dysmenorrhea pain, but not as effective as K_3.

The combination of dysmenorrhea exercises and warm compresses will provide a more effective synergistic effect in reducing dysmenorrhea pain. Dysmenorrhea exercises play a role in reducing muscle spasms and increasing blood flow to areas that are experiencing tension, while warm compresses help improve blood circulation and support the tissue healing process by dilating blood vessels. The combination of these two interventions is effective in reducing dysmenorrhea pain because they complement each other in relaxing muscles and increasing blood flow.

The findings of this study indicate that dysmenorrhea gymnastics, warm compresses utilizing warm water zak (WWZ), and their combination were equally effective in alleviating dysmenorrhea pain intensity. However, the group that combined dysmenorrhea gymnastics with warm compresses using WWZ (referred to as K3) proved to be the most effective in reducing pain associated with dysmenorrhea. Therefore, it can be concluded that H1 is accepted, signifying that the combination of dysmenorrhea gymnastics and warm compresses with warm water zak (WWZ) significantly impacts the reduction of dysmenorrhea pain intensity among Level 4 Bachelor of Applied students.

The limitations of this study lie in the small sample size, so the generalizability of the results is limited and not fully representative of the wider population. In addition, the use of pain self-reporting may introduce subjective bias that affects the accuracy of the data. Therefore, future research is recommended to use a larger and more diverse sample, as well as apply more objective pain assessment methods to improve the validity of the findings.

V. CONCLUSION

The purpose of this study is to ascertain whether the combination of warm compresses with warm water zak (WWZ) and dysmenorrhea gymnastics can reduce the intensity of dysmenorrhea pain in level IV students enrolled in the Bachelor of Applied Nursing program. The findings indicated that the pain scale significantly decreased following the administration of dysmenorrhea exercises, warm compresses with WWZ, or both, while the control group experienced no reduction in pain intensity.

So it can be concluded that dysmenorrhea gymnastics, warm compresses with warm water zak (WWZ), and the combination of dysmenorrhea gymnastics and warm compresses with WWZ are both effective in reducing the intensity of dysmenorrhea pain, but the combination group of dysmenorrhea gymnastics and warm compresses with WWZ (K3) has proven to be the most effective option for reducing dysmenorrhea pain.

Based on the findings of this study, it is recommended that health workers, especially nurses, start integrating nonpharmacological interventions such as dysmenorrhea exercises and warm compresses with Warm Water Zak (WWZ) into routine care plans for patients with dysmenorrhea. These interventions can be applied as promotive and preventive efforts to reduce dependence on analgesic drugs and improve holistic patient comfort.

VI. REFERENCES

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