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Research article

The Effectiveness of Yoga and Chamomile Tea on Sleep Quality in Adolescents Experiencing Dysmenorrhea

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Abstract.

Primary dysmenorrhea occurs in adolescents at the age of 12-20 years with a prevalence of 60-93%. Acute pain due to dysmenorrhea can cause sleep disturbances in adolescents because they feel uncomfortable due to menstrual pain. Impaired sleep quality can lead to physiological and psychological disorders. The purpose of this study was to determine the effectiveness of yoga and drinking chamomile tea on the sleep quality of adolescents with dysmenorrhea. A quasi-experimental pre-test post-test design was used with a control group. The results showed that there was a significant difference in the average sleep quality of adolescents before and after yoga and drinking chamomile tea compared with the control group. Therefore, we can conclude that yoga and drinking chamomile tea can be effective in reducing sleep disorders caused by menstrual pain in adolescent girls with dysmenorrhea.

Keywords: adolescent, chamomile, dysmenorrhea, sleep quality, yoga

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1. Introduction

In the world, dysmenorrhea is the most common gynecological problem in 90% of adolescent girls and more than 50% of menstruating women, and 10-20% experience severe pain [1]. In Indonesia, the incidence of dysmenorrhea is 64.25% consisting of 54.89% primary dysmenorrhea and 9.36% secondary dysmenorrhea [2]. Primary dysmenorrhea occurs in adolescents aged 12-20 years [3], with a prevalence of 60-93% [4].

Dysmenorrhea, also known as painful periods or menstrual cramps, is pain during menstruation [5, 6]. The pain is usually in the pelvis or lower abdomen. Other symptoms may include back pain, diarrhea, or nausea [5]. Acute pain due to dysmenorrhea can cause sleep disturbances because individuals feel uncomfortable due to the pain [7]. Disrupted sleep quality can lead to physiological and psychological disorders. Physiological impacts include decreased daily activities, weakness, decreased endurance, and instability of vital signs. While the psychological effects include depression, anxiety, and not concentration so that it can interfere with activities [8].

The research results indicated the group have severe menstrual pain, poor sleep quality scores than the other groups. Mean score sleep quality in the students who used the pain medication was significantly higher [9]. Sleep quality was significantly correlated with the severity of pain in primary dysmenorrhea [10]. Sleep quality was found to be poorer in the students having a history of dysmenorrhea. Dysmenorrhea is an important health problem in young women. Dysmenorrhea affects sleep quality negatively [11].

More than two-thirds of adolescents (63.8%) with dysmenorrhea use home remedies as their primary intervention option [2]. One of the appropriate dysmenorrhea interventions for adolescents is physical exercise, where physical exercise can increase the activity of endogenous opioids in the central and peripheral nervous system and induce a feeling of happiness (euphoria) and reduce pain and improve sleep quality [12].

Physical exercise by doing yoga can reduce pain during dysmenorrhea starting with *sukhasana* poses than to core postures including seated twists pose, butterfly pose, child pose, cat and cow pose, bridge pose, camel pose, downward-facing dog pose and ends with savasana poses for body relaxation [4]. In addition to doing yoga postures, giving warm chamomile drinks is done to relax uterine muscle spasms, and improve sleep quality in adolescents who suffer from dysmenorrhea. With double- action treatment in the form of yoga and drinking chamomile tea, it is hoped that dysmenorrhea will be reduced and the sleep quality of adolescents will increase. Adolescents can perform this intervention independently (self-care), and adolescents are not dependent on pain-reducing drugs (painkillers).

Yoga and chamomile tea as a breakthrough intervention to improve sleep quality in dysmenorrhea adolescents in Indonesia today. Research on the use of Chamomile drinks or capsules is widely used in elderly and postmenopausal women who have sleep disorders [13]. The use of chamomile extract can significantly improve sleep quality among elderly people. Thus, it can be used as a safe modality for promoting elderly people's sleep [14]. There has been no research that combines yoga activity and drinking chamomile tea in adolescents. So it is necessary to further research whether yoga activities and drinking chamomile tea are effective for improving sleep quality when adolescents experience dysmenorrhea.The purpose of this study was to determine the effectiveness of dual action treatment (yoga and drinking chamomile tea) to the sleep quality of adolescents suffering from dysmenorrhea by comparing them to the control group.

2. Methods

2.1. Study Design

The study design is a quasi-experimental pre-test and post-test with a control group with a cross-sectional approach in West Java, Indonesia in 2020 [15].

2.2. Settings and Samples

This research was conducted in West Java and Banten provinces from March to October 2020. The study population was 224 female students of Faculty of Science and Health Technology University Jenderal Achmad Yani who experienced dysmenorrhea, aged 17-21 years. The sample was taken using a simple random sampling technique of 54 people who met the inclusion criteria, namely: respondents who had menstruated for 1 year or more, had regular menstruation every month, had dysmenorrhea every month, had sleep disorder, were not sports athletes, were willing to drink chamomile tea and had no history of allergies. Chamomile and Asteraceae plant groups and in good health. The research subjects were divided into two groups, namely the intervention group and the control group, each group of 27 people.

2.3. Data Collection

After obtaining a research permit and research ethics approval. Researchers conducted research data collection at that time. Respondents had their menstrual period assessed and their pain scale measured (pre-test) on the first 24 hours of menstruation using the Numeric Rating Scale (NRS) instrument. On the second day, the sleep quality pre-test was measured using the Sleep Quality Questionnaire instrument. The Sleep Quality Questionnaire instrument has been modified based on The Pittsburgh Sleep Quality Index (PSQI). The Sleep Quality Questionnaire instrument was compiled based on 7 (seven) modified sleep parameters from the PSQI Questionnaire consisting of 19 question items, where these items were a combination of 7 (seven) modified sleep parameters including (1) total hours of sleep at night, (2) time to start sleep, (3) frequency of awakening, (4) feeling refreshed when getting up in the morning, (5) depth of sleep, (6) satisfaction of sleeping at night, (7) feeling tired/drowsy during the day. The addition of one question at the end of the questionnaire is about the patient's perception or "self-report" of the patient in general about his sleep quality, whether he experienced

good sleep quality or poor sleep quality. The rating range for this questionnaire is 0-3 [16].

In the experimental group, 2 weeks before menstruation the following month, yoga was given based on the Standard of Procedure and yoga tutorial videos that had been designed by the researcher. Then the respondents did yoga 2x a week for 30-45 minutes. Respondents drank 2 glasses of warm chamomile a day, in the morning and evening when there were signs of menstruation when the blood came out and, continued until the second day of menstruation. While the control group was given a deep breath relaxation technique intervention without giving chamomile drinks.

Post-test measurements were carried out after the intervention. Post-test measurement of menstrual pain using the Numeric Rating Scale instrument was carried out after the intervention in the first 24 hours of menstruation and measurement of sleep quality was carried out on the second day using a modified Sleep Quality Questionnaire instrument from the Pittsburgh Sleep Quality Index (PSQI). Data collection was carried out for 4 months using online methods such as WhatsApp, Zoom, Video, and Google forms because the researchers and most of the respondents were in the red zone of the COVID-19 pandemic.

2.4. Data Analysis

Data analysis was performed using SPSS 16 for univariate analysis, t-dependent test on the control group, and Wilcoxon test on the intervention group because the data were not normally distributed.

2.5. Ethical Consideration

Before data collection, the researcher proposed ethical clearance for the study and received approval from the Health Research Ethics Committee (KPEK) with N0. 01 / KEPK / III / 2020 dated 3 March 2020.

3. Results

The results showed that the average age of the respondents was 19 years, the average length of menstruation was 7 years, and the average menstrual pain scale was 6.48 in the intervention group (table 1) and 6.26 in the control group (table 2), included in the category of moderate pain leading to severe pain. The average score of sleep quality

Table 1: Characteristics of Intervention and Control Group Respondents.

Variable	Mean	Median	SD	Min-Max
Intervention Group Age	18.96	19.00	0.759	17-20
Length of Menstruation	6.67	7.00	1.414	3-10
Menstruation pain	6.48	6.00	1.341	4-9
Quality of sleep	10.52	11.00	3.412	3-15
Control Group				
Age	**18.81**	**19.00**	**0.557**	**18-20**
Length of Menstruation	7.26	7.00	1.789	4-13
Menstruation pain	6.26	7.00	1.701	2-10
Quality of sleep	7.70	8.00	3.372	2-15

Table 2: Distribution of Average Sleep Quality of Adolescents Before and After Yoga and Drinking Chamomile Tea During Dysmenorrhea With Control Group.

Variable	Mean	SD	Mean Rank	P value	N
Sleep Quality In Intervention Group Pre-test Post-test	10.52 6.41	3.412 2.650	13.46 2.00	0.000	27

Table 3

Sleep Quality In Control Croup Pre-test Post-test	**7.70 8.04**	**3.372 3.600**	**0.649 0.693**	**0.542**	**27**

before intervention in the experimental group was 10.52 and the control group was 7.70, the average score was above 5, included in the category of poor adolescent sleep quality.

The results of the statistical test showed that the mean rank of sleep quality of adolescents before doing yoga and drinking chamomile was 13.46, after doing yoga and drinking chamomile the mean rank was 2.00. The value of p = 0.000 (α <0.05), it was concluded that there was a significant difference in the average sleep quality of adolescents before. and after yoga, and drinking chamomile with a decrease in sleep quality scores of 4.11. Likewise in the control group, it was found that the average sleep quality of adolescents before deep breathing relaxation was 7.70 (severe pain) with a standard deviation of 3.372. After doing deep breathing relaxation the average quality of sleep is 8.04 (severe pain) with a standard deviation of 3.60. The results of the statistical test obtained p-value = 0.542, it was concluded that there was not a significant difference in the average quality of sleep before and after deep breathing relaxation in the control group.

4. Discussion

The use of yoga and drinking chamomile tea can significantly improve sleep quality among adolescent girls with dysmenorrhea. The results of a similar study in pregnant women found that there was an effect of prenatal yoga on sleep quality [17]. Likewise, the results of research on the elderly found that yoga intervention can improve the quality of life and sleep quality of the elderly living in nursing homes [18]. The addition of regular yoga activities in the daily routine of the elderly can help achieve good sleep quality and improve quality of life [19]. The results of a systematic review and meta-analysis of the effect of yoga on sleep quality and insomnia in women with sleep problems suggest that yoga interventions in women may be beneficial when compared to non-active control conditions in terms of managing sleep problems. The analysis shows that the benefits of yoga are greater, and are directly correlated with sleep quality [20]. Chamomile acts as a nervine and a mild sedative that reduces stress relaxes the nervous system and induces the body to be in a state of rest. The flavonoids in chamomile cause a calming effect so that the body becomes calmer and more relaxed and can make you sleepy [21]. So that yoga and drinking chamomile can be recommended to overcome the problem of poor quality sleep or pain during menstruation.

Yoga is also characterized as a mindful mode of physical activity. Mindfulness, as an important component of yoga, improves sleep disturbances by increasing melatonin levels, reducing hyperarousal, and treating stress-related cardiac and respiratory disorders [19]. Good quality sleep is associated with better health, reduced daytime sleepiness, better well-being, and better psychological functioning [20]. For most sleep continuity variables (sleep latency, number of awakenings >5 minutes, wake after sleep onset, and sleep efficiency), panel members agreed that these measures are appropriate indicators of good sleep quality across the lifespan. Overall, however, there is little or no consensus regarding sleep architecture or nap-related variables as elements of good sleep quality [22]

While tea chamomile drinks it-self is herbal medicine for the treatment of primary dysmenorrhea. Chamomile tea is anti-inflammatory and antispasmodic [19]. Chamomile can increase glycine levels in the urine. Glycine is a substance that can help reduce muscle cramps during menstruation. This herb acts as a nervine and a mild sedative that reduces stress relaxes the nervous system and induces the body to be in a state of rest. Very useful when women experience menstrual cramps due to anxiety and irritability. Chamomile is the best sipped and tea drink during menstruation [20].

Consuming chamomile tea before going to sleep is believed to make the body's muscles relax and make the individual sleep faster. Chamomile can provide a calming effect for the body and can make you sleepy. The calming effect of chamomile tea is due to the flavonoids it contains. This content can bind to benzodiazepine receptors in the brain, causing drowsiness [23]. Chamomile tea has active ingredient apigenin which will bind GABA in the brain to reduce excessive brain activity so that the body becomes calmer and more relaxed. So that chamomile tea can be consumed by adolescent girls with dysmenorrhea to reduce sleep disorders [24].

Yoga and drinking chamomile tea is double-action treatments, apart from reducing menstrual pain (dysmenorrhea) but also improving sleep quality. In this study, yoga was carried out in a span of 15-30 minutes, whereas doing yoga for at least 10 minutes was able to change the pattern of accepting pain to a more calming phase by stimulating the body to release endogenous opioids (compounds that function to inhibit pain) so that the body's muscles become weaker, relax and sleep faster and sleep better [6]. Improved sleep quality can directly affect pain perception by strengthening coping resources, thereby limiting the degree of disturbing pain sensations ability to perform daily activities [25]. The limitation of this study is that when data collection cannot be done directly face to face with respondents due to the red zone of the Covid-19 pandemic, so that questionnaire data collection through Google Forms and Whats App and yoga interventions is carried out by practicing online with media links YouTube, WAG, and zoom so that the implementation of the intervention cannot be monitored optimally.

5. Conclusion

Yoga and drinking chamomile are proven to be more effective in reducing sleep disorders and menstrual pain in adolescent girls with dysmenorrhea. The provision of double action yoga treatment and drinking tea chamomile can be recommended as a non-pharmacological action and complementary therapy to reduce sleep disorder because of menstrual pain or other. Future research on yoga and chamomile interventions can be carried out on adolescents with sleep disorders, other physical disorders and anxiety problems.

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