



The Effect of Yoga on Body Mass Index and Dysmenorrhoea in Female Students Majoring

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ABSTRACT

Introduction: Dysmenorrhoea is pain that occurs during menstruation. This causes the body to feel bad and reduces the routine activities of people with dysmenorrhoea. One factor that can reduce dysmenorrhoea is yoga exercises. Yoga is a physical activity, learning mental and breathing techniques to relieve stress, relieve anxiety, reduce menstrual pain, and control weight to be more ideal. This study aims to determine the effect of yoga on body mass index and dysmenorrhoea in female students of the Department of Nutrition at the Ministry of Health East Kalimantan Polytechnic. **Method:** This research is a type of Experimental Quasy research with a type design of group pretest-posttest design. This research was carried out at the nutrition building of the Ministry of Health East Kalimantan Polytechnic in March-April. The samples used were 14 female students majoring in nutrition using a simple random sampling technique. This research has met the ethical requirements and is approved to be carried out, taking into account the National Health Research and Development Ethical Guidelines and Standards (PSEPPKN) with certificate number DP.04.03/7.1/7844/2023. Bivariate analysis is carried out to determine whether there is an influence between each variable using the Wilcoxon test. **Results:** The results of this study showed the influence of yoga on body mass index and dysmenorrhoea in female students majoring in nutrition at the Ministry of Health East Kalimantan Polytechnic marked by p-value Body mass index $0.019 < 0.05$ and P-Value dysmenorrhoea $0.000 < 0.05$. **Conclusion:** Yoga significantly influences body mass index and dysmenorrhoea in female students majoring in nutrition at the Ministry of Health East Kalimantan Polytechnic. **Suggestion:** This can be used as an essential reference for similar research on the effect of yoga on body mass index and dysmenorrhoea and covers a wide range of respondents.

Keywords: dysmenorrhoea, menstruation, yoga

INTRODUCTION

Many women claim that their bodies do not match their idealized selves, which makes it difficult for them to build relationships with others and makes them shy when talking to peers and the opposite sex. Naturally, the emerging adulthood is also referred to as the period between adolescence and adulthood. Maintaining appearance is essential, especially for women who want a more physically attractive and ideal figure. When their physical appearance is judged negatively by the social environment, it generates anxiety. Based on research conducted, it is known that *the body shame* of women aged 18-25 years who experience *body shame* is more in the high category, with 135 people or 57.2%. This is by research conducted by Napitupulu (2016; in Kurnia & Lestari, 2020) on women in the emerging adulthood period, namely the age range of 18 to 25 years, which is an emphasis on the period of personal development known as early adulthood, which stretches from

late adolescence to late twenties (Arnett, 2015). "Emerging maturity" refers to changes in a person's social, cognitive, emotional, and physical context—opportunities to expand emotional and intellectual functioning result from young adults exploring various occupations and career trajectories.

Anxiety is a natural thing that every human being has experienced. Anxiety is an emotional response to an individual's subjective judgment, influenced by the unconscious and of no specific known cause. Based on data from the *National Institute of Mental Health* (2005), in the United States, there are 40 million people who suffer from anxiety disorders at the age of 18 years to the elderly. In Indonesia, the number of adolescent girls who experience emotional disorders is 20%. Factors that can cause menstrual pattern disorders in Hestiantoro (2009) are hormonal function disorders, systemic disorders, anxiety, thyroid, excess prolactin hormone, physical abnormalities (reproductive organs) such as fertility disorders, recurrent abortions, and malignancy in the reproductive organs.

Menstruation is the discharge of blood due to the shedding of the endometrium, which contains many blood vessels. The menstrual cycle is the time from the first day of menstruation until the next period in the following month. The menstrual cycle length is the difference between the start date of the previous menstruation and the date of the current month. Usually, a woman's menstrual cycle is approximately 21-35 days, and only 10-15% have a menstrual cycle of 28 days with a menstrual length of 3-5 days, and some menstruation is 7-5 days. Factors influencing the menstrual cycle are body mass, physical activity, stress and anxiety, diet, environmental exposure and working conditions, social interaction, and environment (Kusmiran, 2019).

Weight, stress, physical activity, environmental exposures, food, and changes in hormone function can cause menstrual cycle disruptions (Han and Goleman, Daniel; Boyatzis, Richard; Mckee, 2019). Menstrual cycle problems and hormonal imbalances are closely related. By performing tests on various hormone levels in the laboratory, it is possible to identify imbalanced hormones. The interaction of anxiety levels and physical exercise leads to a component of hormonal imbalance. Anxious people have an active amygdala, which increases the release of corticotropin-releasing hormone (CH) from the hypothalamus.

The menstrual cycle brings many physiological and psychological changes in girls' lives. No matter the girl's time or phase, she tends to be affected in various ways. Whether it is physiological or psychological impact, a girl has to go through it. One time, he experienced a period of pressure from family and society. There are so many stigmas related to the menstrual cycle, and because of these stigmas, what a girl must go through is very difficult for people and even her family to understand.

World Health Organization (2018) According to the prevalence of dysmenorrhoea in various studies showing a considerable frequency, it was found that the incidence of dysmenorrhoea amounted to 1,769,425 people (90%) women with dysmenorrhoea 10-15% experienced severe dysmenorrhoea. In America, the prevalence rate is close to 60%, and in Sweden, 72%.

In Indonesia, the prevalence of dysmenorrhoea is 64.25%, with primary dysmenorrhoea as many as 54.89% of cases and secondary dysmenorrhoea as much as 9.36%. Among women of childbearing age, the incidence of dysmenorrhoea ranges from 45 to 95%. Adolescents have dysmenorrhoea with a prevalence of 43-93%, with moderate dysmenorrhoea accounting for almost 80% of cases.

Due to the production of prostaglandins during menstruation, dysmenorrhoea causes pelvic pain. This is common at the beginning of the menstrual cycle (Kusmiran, 2019). Primary dysmenorrhoea, which is associated with hormonal components that regulate the uterus and no anatomical abnormalities are found, is one of two types of dysmenorrhoea. Cases of dysmenorrhoea should not be ignored because it can interfere with daily activities. Adolescents who experience dysmenorrhoea will feel uncomfortable carrying out daily activities (Putri *et al.*, 2017).

Rumanti *et al.* (2022). According to the research findings, yoga considerably influences changes in the severity of menstrual pain (dysmenorrhoea) with a *p-value* of 0.034 to 0.05. The reason is that yoga can reduce pain by relaxing the uterine muscles, which are prone to spasms and ischemia due to increased prostaglandins that cause blood vessels to dilate. To ease the pain felt, this results in increased ischemia and blood flow to the area of spasm. Endorphins and enkephalin, two substances that reduce pain, may be released through yoga relaxation techniques (Sihan, 2012). Not only that but yoga exercises also that are done regularly can facilitate blood circulation so that the pain that arises can disappear (Wirawandha, 2014)

Smeltzer & Bare (2001) Yoga is excellent for burning many calories even though it is not a very intense workout. Practicing light yoga poses regularly can burn fat, just like weightlifting. According to the body, it will feel calm after doing yoga for 15 to 30 minutes regularly, systematically, and according to the body's condition.

Increase blood flow to places of seizure and ischemia and consequently dilate blood vessels. The body stops producing all the hormones it needs to cope with stress, including adrenaline, when it is calm. It can, therefore, observe relaxation in this way, allowing the body to create the hormones necessary for menstruation without pain. Yoga poses can reduce dysmenorrhoea and maintain a healthy body composition according to the BMI categorization system. This study was conducted to determine whether yoga influences body mass index and dysmenorrhea in female students majoring in nutrition at Poltekkes Kemenkes Kaltim.

METHOD

This type of research is *quite experimental* with type design *one group pretest-posttest design* where each subject becomes a control for himself, namely by looking at the influence of yoga on body mass index and dysmenorrhoea in the Department of Nutrition Poltekkes Kemenkes Kaltim. The sample of this study was a student majoring in nutrition in semester 6 (even).

The number of samples used in this study was determined by saturated sampling. Saturated sampling is a sampling technique that uses all population members as samples (Nanang Martino,

2010). Data collection techniques in this study will be collected with primary sources, meaning that data sources will directly provide the data needed by researchers. The technique or method of data collection in this study is through questionnaires (questionnaires) filled out by nutrition students. This study's research instrument was a primary or closed questionnaire. The questionnaires contained in this study had alternative answers that would eliminate neutral or undecided answer options. This study used validity testing and reliability calculations. To test the instrument's validity, the Product Moment Correlation technique is used, and the results of the validity analysis are consulted with (label) at a significant level of 5%. Reliability calculations will be calculated with internal consistency. The data analysis technique used is descriptive statistics. According to Sugiyono (2019: 232), descriptive statistics are used to analyze data by summarizing the data obtained and are not intended to generalize. Without drawing general conclusions or generalizations, descriptive analysis examines data by summarizing or describing the data as it is collected.

Descriptive analysis is used to analyze data by describing or describing the collected data as it is without making general conclusions or generalizations. According to Sugiyono (2019: 232), descriptive statistics are statistics used to analyze data by describing the data collected and are not intended to draw universally applicable conclusions.

RESULTS AND DISCUSSION

This research was conducted at Poltekkes Kemenkes Kaltim, Loa Janan Kutai Kartanegara District. The research was conducted in March-April 2023. In this study, 14 samples were obtained from students majoring in nutrition semester 6 (six) Poltekkes Depkes Kaltim, which is one of 38 Poltekkes in Indonesia which was formed based on the letter of the Ministry of Health-Kesos RI Number: 293 / Menkes-Kesos / SK / IV / 2001 dated April 16, 2001, concerning the organization of Poltekkes work procedures for the Implementation of Health Worker Education.

The Department of Nutrition, located at the Poltekkes Kemenkes Kaltim, led by the head of the Department, Mrs. Dr. Aminah Toaha, M. Kes, is the only nutrition department in East Kalimantan with accreditation B. The Department of Nutrition is addressed at Jl.Kurnia Makmur, Harapan Baru, Loa Janan Ilir District, Samarinda City, East Kalimantan, zip code 75242.

Table 1. BMI Characteristics and Dysmenorrhea in Nutrition Student

Characteristics	Before		After	
	n	%	n	%
BMI				
Underweight	4	28,6	1	7,1
Normal	0	0	8	57,1
Overweight	6	42,9	1	7,1
Obesity	4	28,6	4	28,6

Total	14	100	14	100
Dysmenorrhea				
Mild pain	1	7,1	4	28,6
Severe pain	5	35,7	7	50
Very severe pain	8	57,1	3	21,4
Total	14	100	14	100

Source: 2023 Primary Data

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Kategori lebih menjorok dari variabel

Based on the results of the table obtained before yoga exercises, almost half of the respondents are overweight. That is 6 (six) female students, 42.9%, and almost half of them also have weight Underweight and obesity by 4 (four) female students, 28.6%. Meanwhile, after being given yoga exercises, most respondents gained weight as much as eight people or 57.1%, and a small number of respondents experienced weight Underweight and overweight. That is 1 (one) person or 7.1%. As for dysmenorrhoea itself, before yoga exercises, most respondents experienced very severe pain, namely 8 (eight) people or 27.1%, and a small number experienced deep pain, which was as many as 1 (one) respondent or 7.1%. Meanwhile, after doing yoga exercises, half of the respondents experienced severe pain, namely 7 (seven) people or 50%, and a small number of respondents experienced very severe pain, namely 3 (three) people or 21.4%.

Table 2. Effect of Yoga on BMI in Female Nutrition Students

BMI	Before		After		P Value (95% CI)
	n	%	n	%	
Underweight	4	28,6	1	7,1	0,019
Normal	0	0	8	57,1	
Overweight	6	42,9	1	7,1	
Obesitas	4	28,6	4	28,6	

Source: 2023 Primary Data

The results of Wilcoxon's statistical test obtained p value = 0.019 < α = 0.05, then H0 was rejected, and Ha was accepted, which means yoga influences body mass index in female students majoring in nutrition.

Table 3. The Effect of Yoga on Pain Levels

Pain Levels	Before		After		P Value (95% CI)
	n	%	n	%	
Mild pain	1	7,1	4	28,6	

Severe pain	5	35,7	7	50	0,000
Very severe pain	8	57,1	3	21,4	

Source: 2023 Primary Data

The results of the Wilcoxon Dysmenorrhoea statistical test obtained p value = 0.000 α = 0.05, then H₀ was rejected, and H_a was accepted, which means there is an influence of yoga gymnastics on dysmenorrhoea in female students majoring in nutrition.

1. Body Mass Index (BMI) in Nutrition Department Students at Poltekkes Kemenkes Kaltim

Body Mass Index (BMI) is a quick and easy way to determine nutritional status. Based on data collected in April 2023 from 14 respondents, four (four) female students (28.6%) are underweight, six (six) female students (42.9%) are overweight, and four (four) female students (28.6%) are obese. It can be determined that 6 (six) female students (42.9%) majoring in nutrition have overweight BMI.

The food we eat and how we utilize the nutrients we consume determines our nutritional status, which is the condition of the human body. There are two (two) factors, direct and indirect, that have an impact on nutritional status. Disease and the use of different foods are the direct causes. Family economics, food production, and health facilities are indirect contributors. A healthy amount of physical exercise helps control and maintain an average body mass index and helps a person lose weight, which can also impact body mass index (Bolang *et al.*, 2021)

Fajria *et al.*, (2022) results show that the percentage of subjects with negative perceptions in the two groups is not significantly different. This is because many other aspects besides nutritional status can affect a person's satisfaction with his physical appearance. Teenagers' dissatisfaction with their body shape is influenced by pressure from classmates, parents, and the media. Women tend to feel less satisfied with their physical shape and weight than men because they believe that a taller and slimmer body is the ideal proportion to have (Zaccagni *et al.*, 2014). Not only obese women, women with sufficient nutritional status also feel dissatisfied with their bodies. However, compared to women with average nutritional health, obese women tend to have higher levels of body shape dissatisfaction. Body image perception assessments were also performed based on the subscales of evaluation of appearance, appearance orientation, satisfaction with body parts, concerns about gaining weight, and categorization of body size.

Physical appearance, which significantly impacts self-confidence, depends on how a person perceives his physical state, including body shape or weight, and how she assesses his physique and the shape he wants. An increase in weight accompanies the stages of puberty experienced by these young women. Young women also experience a stage of poor body image formation and the desire to do a diet program; besides that, the body becomes heavier. Late teenage girls struggle with body image issues, prioritizing attractiveness, and trying to change their appearance to fit their peers.

Unbalanced food intake is a problem associated with nutritional problems. In Indonesia, the prevalence of obesity in adolescents is 10.8%, consisting of 7.3% overweight and 3.5% very overweight (obesity), while the prevalence of underweight is 11.1%, consisting of 3.3% skinny and 7.8% very thin. % of thin individuals. The percentage of obese adolescents changed according to data from Basic Health Research from 2010 to 2013, from 1.4% in 2010 to 7.3% in 2013. According to this study, more and more young people manage their diet unbalanced every year. For a variety of reasons, teenagers often struggle with their nutritional status. Among them are adopting a poor diet without understanding the nutritional value of the food they consume, having a wrong understanding of nutrition triggered by teenagers' desire to have a slim body, and having excessive preferences towards certain types of food, which prevents their nutritional needs from being appropriately met. The nutritional status of adolescents is influenced by several variables (multifactorial). One factor that affects adolescents' nutritional status is *body image*, or a person's impression of their body shape and size, which is influenced by actual body shape and size and expectations of the desired body shape and size.

The body needs protein intake, especially in adolescents whose bodies are undergoing tremendous growth and development during adolescence. So, it takes adequate protein intake. Long-term malnutrition will result in Energy-Protein Deficiency disease and low nutritional conditions. Protein deficiency will result in stunted growth, weakened immune system, increased disease susceptibility, and reduced creativity and productivity. Food consumption will be related to the disease that will be experienced by the individual (Susanti, 2020).

Maintaining a healthy weight is very important, and the primary method of yoga to change shape and weight is to increase physical activity and awareness. Yoga practice considers the elements that can adhere to fitness improvement guidelines. Rigorous yoga practice can increase basal metabolic rate (BMR) and burn up to 250 kcal per session, which can help people lose weight. The primary strategy of yoga to influence body shape and weight is increased physical activity and awareness. According to the findings of previous Indian research, Fatimah et al. (2018) found that doing yoga ten times for 60 minutes can help lose weight drastically.

Based on the findings of direct interviews with respondents, it is known that female students who are underweight claim to lack physical activity and have unhealthy eating habits, such as only eating once or twice a day with small portions to save costs because the majority of female students are international students. Female students who are obese claim to do physical activity rarely and like to consume.

2. Dysmenorrhoea Pain Level in Nutrition Department Students at Poltekkes Kemenkes Kaltim

The results showed that most respondents, 8 (eight) people, or 27.1%, experienced severe pain before doing yoga, while only one (one) respondent, or 7.1%, experienced deep pain. Dysmenorrhoea is pain that begins at or before the start of menstruation and lasts for one to two

days. Back pain that radiates to the upper or middle thighs. Fatigue, nausea, vomiting, diarrhea, low back pain, headache, and vertigo are common symptoms of dysmenorrhoea. Anemia, a family history of dysmenorrhoea, and nutritional status contribute to this condition.

Dysmenorrhoea can cause cramps in the lower abdomen, back pain, breast tenderness, and other symptoms. Pain begins before, during, and after the menstrual cycle. According to, headaches, nausea, and sometimes even vomiting are common symptoms of dysmenorrhoea. Some yoga positions often include physical poses, breathing techniques, and meditation or relaxation to improve physical fitness and reduce stress, according to Sutar *et al.* (2016). In addition, frequent practice of yoga can help relieve anxiety and reduce dysmenorrhoea as well (Amru & Selvia, 2022).

Dysmenorrhoea should be taken seriously because it can interfere with daily activities and cause anxiety, sadness, infertility, and ruptured cysts, among other effects. There are many ways to reduce dysmenorrhoea, including herbs or herbal remedies, pain relievers, relaxation techniques, and exercise. Yoga is a method that teaches how to calm, breathe, and position the body to build strength, balance, and reduce pain. Yoga sessions can last for 15-30 minutes or 2 (2) repetitions in 8 (eight) counts of each movement while regulating breathing (Maryam *et al.*, 2018).

Based on the results of the *pre-test* on the first day, 8 (eight) people who experienced dysmenorrhoea complained of pain so severe that they could not perform maximum activities as usual. Menstruation, according to respondents, causes extreme mood swings such as impatience, anger, and melancholy, as well as an increased desire to lie in bed all day. Therefore, it is thought that practicing yoga at home can help a person unwind and reduce the discomfort of dysmenorrhoea.

3. The Effect of Yoga on Body Mass Index in Nutrition Department Students

According to research findings using the *Wilcoxon Signed Rank Test*, yoga practice positively impacts body mass index (BMI) in female nutrition students at the Ministry of Health East Kalimantan Polytechnic. It can be concluded that there is an influence of yoga on the body mass index of female students majoring in nutrition Polytechnic of the Ministry of Health East Kalimantan based on the results of *the Pre-Test* and *Post-Test* significance tests, where the body mass index is $p \text{ value} = 0.019 = 0.05$.

Several studies conducted by several previous researchers, including Desy (2018), provide support for this study, showing that there is a significant influence between yoga exercise and body mass index marked by Hantari (2017), Fatkhurohmaningtias & Yuliastrid (2016), Lestari (2018) p -value results <0.05 .

However, in contrast to the research of Putri Nur Fatimah (2018) on obese adult women who did not find a relationship between yoga practice and % body fat indicated by a P -value of > 0.05 (Blow, 2015). Hidayati (2015) Yoga is a low-intensity activity with a high calorie-burning potential. Regular gentle yoga practice can burn fat just as much as lifting weights. Claims that increased physical activity, specifically with the treatment of yoga exercises offered for 12 consecutive days for respondents who rarely exercise, is what causes the benefits of yoga practice on body mass index.

More physical activity can result in burning body fat reserves to meet the body's caloric needs during yoga practice. According to research, yoga impacts body mass index in female students majoring in nutrition at the Ministry of Health East Kalimantan Polytechnic. Because respondents believe their weight is unhealthy, regularly practicing yoga at least twice a week will help them achieve their ideal weight. Do it anywhere, including limited space.

4. The Effect of Yoga on the Level of Dysmenorrhoea Pain in Nutrition Department Students

Based on research findings with the Wilcoxon Signed Rank Test, yoga practice positively impacts dysmenorrhoea in female students majoring in nutrition at the Ministry of Health East Kalimantan Polytechnic. The findings of the Pre-Post Test significance tests show that yoga impacts dysmenorrhoea in female nutrition students at the Health Polytechnic of the Ministry of Health of East Kalimantan ($p\text{-value} = 0.000 = 0.05$).

According to these findings, yoga positively impacts dysmenorrhoea because its abdominal relaxation activity can reduce the production of pain-inducing hormones and relax abdominal muscles. Yoga positions used when experiencing menstrual discomfort include body relaxation poses and breathing techniques that can significantly improve a person's mental state. Yoga activities help build muscles, stimulate the heart, chest, lungs, and brain, and maintain the body's hormonal balance. Anurogo (2011) asserts that dysmenorrhoea needs to be treated immediately to prevent shock, loss of consciousness, and social isolation due to excruciating pain (Wirawandha, 2014)

The difference in pain scale before and after yoga can be used to detect dysmenorrhoea in 7 (seven) participants. Regular yoga practice, which can be done daily, two or three times a week for 15 to 30 minutes, can help with dysmenorrhoea symptoms. This way, we can rest the body and allow it to make vital hormones that make menstruation less painful. According to research, yoga impacts dysmenorrhoea among female nutrition students at the Ministry of Health of East Kalimantan because they pose once or twice a week for 15 to 30 minutes. As a result, those who previously experienced very intense pain now only experience moderate pain.

CONCLUSION

Based on the responses of 14 respondents, it is known that 78.6% are under 21 years old, and 7.1% are over 23 years old, which is the whole sample. Based on the results of the body mass index (BMI) of 14 respondents, about half of the respondents were overweight, or 6 (six) female students or 42.9%, and almost half were underweighted and obese, or 4 (four) female students or 28.6%. Based on the results of the pre-test on the first day, 8 (eight) people who experienced dysmenorrhoea complained of pain so severe that they could not perform maximum activities as usual. Menstruation, according to respondents, causes extreme mood swings such as impatience, anger, and melancholy, as well as an increased desire to lie in bed all day. Therefore, it is thought that practicing yoga at home can help a person unwind and reduce the discomfort of dysmenorrhoea.

Based on the findings of the *Wilcoxon Signed Rank Test*, it is known that yoga impacts body mass index in female students majoring in nutrition at the Ministry of Health East Kalimantan Polytechnic. with a $p = 0.019 = 0.05$. The results of the *Wilcoxon Signed Rank Test* statistical test for dysmenorrhoea showed a $p\text{-value} = 0.000 = 0.05$, which showed that yoga affected dysmenorrhoea in female students majoring in nutrition Poltekkes Kemenkes Kaltim. It can be stated that yoga impacts dysmenorrhoea among female nutrition students at the Ministry of Health of East Kalimantan because they do yoga once or twice a week for 15 to 30 minutes. As a result, those who previously experienced very intense pain now only experience moderate pain.

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