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RESEARCH

Symptoms Of Premenstrual Syndrome That Affect The Performance Of Female Martial Arts Athletes In Nganjuk Regency

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ABSTRACT

Premenstrual syndrome or PMS is a collection of physical and psychological symptoms that occur during the luteal phase of the menstrual cycle that has an impact on the productivity of female athletes so that there is an assumption that women often become weak during the menstrual period. This study aims to analyze the symptoms of premenstrual syndrome with performance among female martial arts athletes in Nganjuk Regency. This research uses an analytical method. The sample of this study used the purposive sampling technique of 80 athletes. The variables in this study were the symptoms of premenstrual syndrome and athlete performance. The location and time of this research is the Nganjuk Regency Martial Arts Pavilion on March 1-31, 2025. Data collection was carried out by questionnaire. The results obtained from premenstrual symptoms of female martial arts athletes in Nganjuk Regency were mostly experiencing severe premenstrual symptoms. The performance of female martial artists in Nganjuk Regency mostly has sufficient performance. The influence of premenstrual symptoms on the performance of female martial arts athletes in Nganjuk Regency showed a significant influence. It is hoped that female martial arts athletes pay more attention to a balanced nutritional pattern during PMS, including increasing the intake of iron, magnesium, and vitamin B6 to help reduce physical and emotional symptoms, it is recommended to maintain hydration, monitor the menstrual cycle regularly, and adjust the intensity of exercise according to the body condition during PMS.

Keywords: martial athletes, performance, premenstrual syndrome

I. INTRODUCTION

Premenstrual syndrome or commonly known as PMS is a collection of physical, cognitive, affective, and behavioral symptoms that occur periodically during the luteal phase of the menstrual cycle and will disappear/subside during menstruation or a few days after menstruation (Nisa, Hidayah and Izzah, 2024). The high problem of premenstrual syndrome in women will have an impact on their productivity in carrying out daily activities (Thaharah and Afridah, 2023).

Based on research conducted in Indonesia through Adolescent-Friendly Health Services in 2020, as many as 90% of women of reproductive age experienced symptoms of PMS (Nisa, Hidayah and Izzah, 2024). In Indonesia, the prevalence of premenstrual syndrome among female students in Surabaya is 39.2% with severe symptoms and 60% with mild symptoms (Thaharah and Afridah, 2023). Research conducted by Asmarani in Marfu'ah also states that menstrual cycle disruptions are experienced by 28.8% of female athletes (Marfu'ah Kurniawati et al., 2023). According to Armour and Solli (2020), athletes' performance is considered impaired in the early follicular phase and late luteal phase, where athletes can experience fatigue, pain and muscle contractions when menstruation occurs (Marfu'ah Kurniawati et al., 2023). The sense of comfort and discomfort will be related to a person's appearance in doing physical activities/sports. A person's appearance in doing physical

activities/sports has many factors that are indicators of his or her good appearance (Supriadi, 2021).

The reality that has existed so far is that there are still many coaches and athletes who think that maximum achievement can be achieved by practicing continuously (Thaharah and Afridah, 2023). Heavy and tiring training carried out by athletes, of course, has a negative impact on health, one of which is disturbances in reproductive health. In female athletes, the negative risk that can occur is impaired menstrual function (Supriadi, 2021). Then in terms of nutritional intake, research by Iswandari et al., (2020) shows that a balanced diet rich in complex carbohydrates, fiber, as well as vitamins and minerals, especially vitamin B6, magnesium, and calcium, can help reduce PMS symptoms such as bloating, fatigue, and mood swings.

The data obtained above show that the frequency of PMS in late adolescents, especially athletes, is still quite high and sufficiently affects activities, so it is necessary to analyze whether the symptoms of premenstrual syndrome can affect the performance of female martial arts athletes in Nganjuk Regency.

II. METHOD

This study uses a type of quantitative research using a correlational analytical study research design using a cross sectional approach with the aim of collecting data between premenstrual syndrome and athlete performance at one time to determine the effect of premenstrual syndrome on the performance of female martial artists. The sample of this study is a female martial artist from Nganjuk Regency who experiences premenstrual syndrome and is willing to be studied by a total of 80 athletes who were selected through purposive sampling techniques according to considerations with certain criteria by the researcher. The instrument in this study used a menstrual cycle diary (MCD) questionnaire consisting of 20 symptom items that will be filled out by female martial artists during one month of the menstrual cycle according to the symptoms that arise and a standard questionnaire, namely the perceived performance in sports questionnaire (PPSQ) containing 5 questions to measure athletes' performance during premenstrual syndrome.

III. RESULT

GENERAL DATA

Table 1. Frequency Distribution of General Characteristics of Women's Martial Arts Athletes at the Nganjuk Regency Martial Arts Pavilion, March 2025

No.	Characteristic	Category	Frequency	Percentage (%)
1.	Age (years)	10-15	30	37,5
		16-20	47	58,7
		21-25	3	3,8
Sum			80	100
2.	Body mass index	Underweight	45	56,3
		Usual	10	12,5
		Overweight	10	12,5
		Obesity	15	18,7
		Obesity II	0	0
Sum			80	100
3.	Long been an athlete	≤ 2 years	52	65
		> 2 years	28	35
Sum			80	100
4.	Education	JUNIOR	28	35
		SMA	50	62,5
		Diploma/Bachelor's	2	2,5
Sum			80	100

5.	Work	Not Working	78	97,5
		Self employed	1	1,2
		Entrepreneurial	1	1,3
Sum			80	100
6.	History of medication intake during PMS	Yes	4	5
		Not	76	95
Sum			80	100
7.	Family history with STDs	Exist	25	31,3
		None	55	68,7
Sum			80	100
8.	Nutritional intake	Good	29	36,3
		Less	35	43,7
		Moderate deficit	16	20
		Weight deficit	0	0
	Sum		80	100

Based on the results of the study in table 1, it shows that most (58.7%) are 16-20 years old, most (56.3%) have an underweight body mass index , which is < 18.5, most (65%) are athletes ≤ 2 years, most (62.5%) are in high school, almost all (97.5%) have not/not worked, almost all (95%) have no history of drug consumption at the time of PMS, most (68.7%) have no family history of STDs, almost half (43.7%) have undernourished status.

CUSTOM DATA

UNIVARIATE ANALYSIS

SYMPTOMS OF PREMENSTRUAL SYNDROME IN WOMEN'S MARTIAL ATHLETES

Table 2. Distribution of Frequency of Premenstrual Syndrome Symptoms of Women's Martial Arts Athletes in Nganjuk Regency, March 2025

Premenstrual Syndrome	Frequency	Percentage (%)
Mild symptoms	14	17,5
Moderate symptoms	16	20
Severe symptoms	50	62,5
Total	80	100

Symptoms of premenstrual syndrome in female martial artists in Nganjuk Regency are known to be mostly (62.5%) female martial artists experience severe PMS symptoms, a small percentage (20%) of female martial artists experience moderate PMS symptoms, and a small percentage (17.5%) of female martial artists experience mild PMS symptoms.

PERFORMANCE OF WOMEN'S MARTIAL ARTS ATHLETES

Table 3. Frequency Distribution of Performance of Women's Martial Arts Athletes in Nganjuk Regency, March 2025

Performance	Frequency	Percentage (%)
Good	24	30
Enough	50	62,5
Bad	6	7,5
Total	80	100

Performance of Women's Martial Athletes in Nganjuk Regency based on table 3 found that most (62.5%) female martial artists had sufficient performance when PMS symptoms appeared, almost half (30%) of female martial artists had good performance when PMS symptoms appeared, and a small percentage (7.5%) of female martial artists had poor performance when PMS symptoms appeared.

BIVARIATE ANALYSIS

Table 4. Cross-tabulation of Premenstrual Syndrome Symptoms Affecting the Performance of Women's Martial Arts Athletes in Nganjuk Regency (Before Cell Merge), March 2025

Symptoms of Premenstrual Syndrome	Performance						Sum		P Value
	Good		Enough		Bad				
	N	%	N	%	N	%	N	%	
Light	8	57	6	43	0	0	14	100	
Keep	10	62,5	6	37,5	0	0	16	100	0,001
Heavy	6	12	38	76	6	12	50	100	

Table 5. Cross-Tabulation of Premenstrual Syndrome Symptoms Affecting the Performance of Female Martial Arts Athletes in Nganjuk Regency (After Cell Merge), March 2025

Symptoms of Premenstrual Syndrome	Performance				Sum		P Value
	Good		Bad				
	N	%	N	%	N	%	
Light	18	60	12	40	30	100	0,001
Heavy	6	12	44	88	50	100	

Based on table 4, the results of bivariate data analysis between the symptoms of premenstrual syndrome and the performance of female martial artists in Nganjuk Regency show that most (57%) athletes who experience mild premenstrual syndrome have good performance, almost half (43%) have sufficient performance, none (0%) have poor performance. Then, athletes who experienced moderate premenstrual syndrome were found to be mostly (62.5%) in good performance, almost half (37.5%) had adequate performance, none (0%) had poor performance. Meanwhile, athletes who experience severe premenstrual syndrome found that a small percentage (12%) have good performance, almost all (76%) have adequate performance, and a small percentage (12%) have poor performance.

Furthermore, based on the results of statistical tests using the chi-square method to see the influence of PMS on athlete performance. In the initial analysis of table 4.4 with the 3x3 contingency table, it was found that there were more than 20% of cells with an expected count of less than 5, which violated the basic assumption of the chi-square test. To meet the requirements for the chi-square test, an alternative chi-square is carried out, which is a combination of categories in the PMS symptom variable and/or athlete performance variable to produce a 2x2 contingency table. This merger is carried out by paying attention to the similarity of category characteristics and theoretical considerations so that the meaning of the data remains relevant.

After the combination as shown in table 5, all the expected values in each cell were above 5 and the test results showed a $\boldsymbol{\rho}$ value of 0.001 so that $\boldsymbol{\rho}$ the value < 0.05, this indicates that there is a significant influence between the symptoms of premenstrual syndrome and the performance of female martial arts athletes in Nganjuk Regency. The more severe the PMS symptoms experienced, the more likely it is to experience a decrease in performance.

IV. DISCUSSION

SYMPTOMS OF PREMENSTRUAL SYNDROME IN FEMALE MARTIAL ARTS ATHLETES

In table 2, it is found that most (62.5%) female martial arts athletes experience severe STDs because the average age is 15-17 years. Where these results are in line with the Estrogen-Progesterone Imbalance Theory which states that adolescents, especially those in late puberty, where the reproductive and hormonal systems are still in the process of maturing. An imbalance in estrogen and progesterone levels during the luteal phase of the menstrual cycle can lead to disorders such as pain, fatigue, mood swings, and sleep disturbances (Petta et al., 2020).

The results of the study are in line with research conducted by Simonds and Warner (2021) which stated that adolescents are more susceptible to experiencing PMS due to higher hormonal instability than adult women. Similar research has also been conducted by Putri and Fitriani (2020) showing that a local study of high school students in Indonesia aged 15–17 years shows that severe STDs are experienced by more than 50% of female students, and it is more common in those who have high physical activity.

Then female martial artists who have severe STDs mostly have underweight BMI (<18.5) and poor nutritional status. As in the theory of Nutritional Status And Hormonal Regulation, athletes with a BMI below normal and unmet nutritional status tend to have insufficient levels of complex carbohydrates, fiber, and vitamins and minerals, so that they can increase estrogen production through the activity of the aromatase enzyme in adipose tissue (Petta et al., 2020).

In a study conducted by Putri and Lestari (2021), it was shown that adolescents with low BMIs had twice the risk of experiencing severe STDs compared to adolescents with normal BMI. This study is also in line with the results of previous research (Sitorus et al., 2020) which said an unbalanced diet can contribute to hormonal and metabolic disorders that worsen PMS symptoms. Dietary intake high in sugar, caffeine, salt, and saturated fat is known to aggravate PMS symptoms such as mood swings, fluid retention, breast pain, and fatigue.

Adolescence is the most critical time for fluctuations in reproductive hormones, especially when combined with physical exercise in athletes. A woman's endocrine system is not yet fully stable in adolescence, and the burden of exercise can exacerbate the hormonal imbalance that triggers the onset of severe PMS.

The presence of BMI predisposition and nutritional status to the severity of PMS symptoms. BMI and nutritional status in athletes are mostly categorized in the underserved category because at the time of the survey the average nutritional intake of athletes 2-3x/week consumes sugary foods/drinks such as sweet cakes, chocolate, boba, Thai tea, juice with added artificial sweeteners, and rarely consumes dairy products/processed products such as cheese/yogurt, magnesium-rich foods such as spinach, nuts, fruits and vegetables, as well as vitamin supplements.

Athletes with low nutritional status and low BMI often experience reproductive hormone imbalances due to low body fat reserves, deficiencies in micronutrients such as magnesium and vitamin B6 which have an important role in regulating mood, muscle contraction, and hormone metabolism. Therefore, it is recommended that female martial artists pay more attention to a balanced nutritional pattern during the STD period, including increasing the intake of magnesium (nuts, seeds, green vegetables), vitamin B6 (bananas, potatoes, spinach, and fish such as salmon and tuna) to help reduce physical and emotional symptoms. Athletes are also encouraged to maintain hydration, monitor the menstrual cycle regularly, and adjust the intensity of exercise according to the body's condition during PMS. This is very important to create a coaching system that is responsive to the biological needs of female athletes, especially those in the adolescent development phase.

PERFORMANCE OF WOMEN'S MARTIAL ARTS ATHLETES

In table 3, it is found that most (62.5%) female martial artists have sufficient performance at the time of the appearance of PMS symptoms. The majority of athletes have less than 2 years of experience as athletes. Almost half (30%) of female martial arts athletes have good performance when PMS symptoms appear because they have training experience, especially being an athlete for more than 2 years. In line with the statement of the Affective-Reflective Theory (ART) of Physical Inactivity and Exercise which explains that the motivation to exercise is influenced by two processes. First, the automatic affective process is a spontaneous emotional reaction to physical activity, based on previous experience. Second, the reflective process is a conscious evaluation that considers long-term goals and personal values. Athletes who have a positive association with exercise tend to be more motivated to train consistently, even in difficult conditions (Brand and Cheval, 2019).

The results of this study are also in line with the research conducted by (Kartini & Wulandari, 2021) saying that with a training period of less than two years, they are generally still in the stage of adapting to the training load, setting rest times, and stress management. Similar research says that when a person performs regular and progressive physical exercise, body systems such as cardiovascular, musculoskeletal, hormonal, and neurological will adjust to become more efficient and resistant to similar loads in the future (Bompa and Buzzichelli, 2019). Wulandari and Permata (2020) also found that pencak silat athletes with more than 2 years of experience tend to show more stable performance despite experiencing PMS symptoms. Athletes with less than 2 years of experience are more likely to experience a decline in performance due to a lack of adaptability to physiological changes due to STDs.

Exercise experience builds not only physical ability, but also emotional resilience and adaptive strategies to physiological conditions, including PMS. Athletes who are still beginners (less than 2 years old) may not have a strategy for dealing with pain or fatigue during PMS, exercise and recovery patterns that are appropriate to the menstrual cycle. In contrast, athletes with more than 2 years of experience have usually experienced various phases of the menstrual cycle while training or competing. They tend to recognize their body patterns during PMS, prepare themselves by adjusting the intensity of exercise, are more focused and are not easily distracted by symptoms. Thus, experience is a factor that allows athletes to maintain good performance even though they are experiencing PMS. Thus, there is a need for special education and assistance for beginner athletes regarding the influence of the menstrual cycle on performance, as well as training in coping strategies (physical and mental) to minimize its impact. If managed properly, it is not impossible for athletes' performance to remain optimal even though they are in the PMS phase.

3. THE EFFECT OF PREMENSTRUAL SYNDROME SYMPTOMS ON THE PERFORMANCE OF WOMEN'S MARTIAL ARTS ATHLETES

In table 4. Athletes who experience mild and ongoing PMS are found to be found that almost half (43%) and (37.5%) have sufficient performance. Where his experience as an athlete on average has less than 2 years of experience.
The theory of physiological adaptation in sports explains that athletes who regularly train will have better ability to adjust their training load to their body conditions, including when experiencing hormonal disorders such as PMS (Bompa and Buzzichelli, 2018). From the perspective of Affective-Reflective Theory (ART), it is explained that the motivation to exercise is influenced by an automatic affective process, which is a spontaneous emotional reaction to physical activity, based on previous experience. Athletes who have a positive association with exercise tend to be more motivated to train consistently, even in difficult conditions (Brand and Cheval, 2019).

The results of this study are in line with research conducted by (Kartini & Wulandari, 2021) saying that with a training period of less than two years, they are generally still in the stage of adaptation to the training load, rest time management, and stress management. Research by Putri and Lestari (2021) also supports this, where athletes who have an effective coping strategy can still maintain and even improve performance during severe STDs. Wulandari and Permata (2020) also found that pencak silat athletes with more than 2 years of experience tend to show more stable performance despite experiencing PMS symptoms. Athletes with less than 2 years of experience are more likely to experience a decline in performance due to a lack of adaptability to physiological changes due to STDs.

The athletes who experience severe PMS are found to be a small percentage (12%) of them have good performance because they have 3-10 years of training experience, have good nutritional status.

In accordance with the theory of Nutritional Status And Hormonal Regulation explains that nutritional status, especially body fat composition and nutrient intake of micronutrients, has a direct influence on the balance of reproductive hormones, such as estrogen and progesterone. Body fat that does not match the body's needs leads to increased estrogen production through the aromatase

enzyme found in adipose tissue, which can then lead to estrogen dominance, which is a condition often associated with severe STD symptoms. In addition, deficiencies in certain micronutrients such as vitamin B6, magnesium, calcium, and omega-3 fatty acids have also been shown to worsen PMS symptoms, as these substances play a role in the regulation of neurotransmitters (such as serotonin and dopamine) related to mood and pain (Petta et al., 2020).

Research by Iswandari et al., (2020) also shows that a balanced diet rich in complex carbohydrates, fiber, as well as vitamins and minerals, especially vitamin B6, magnesium, and calcium, can help reduce PMS symptoms such as bloating, fatigue, and mood swings. Similar research shows that adolescent girls who regularly consume foods high in vitamin B6, such as bananas and chicken, experience a significant reduction in PMS symptoms, Vitamin B6 helps improve mood, reduce fatigue, and improve muscle function (Putri and Lestari, 2021). Then in the study Wulandari and Permata (2020) said that athletes with good nutritional status who also manage hydration and intake patterns correctly are better able to maintain performance, even when facing severe PMS.

Furthermore, athletes who experienced severe PMS were found to be almost all (76%) having sufficient performance. Most athletes have a poor nutritional status.

Physiological Nutrition and Function Theory states that calcium and magnesium have a large role in reducing PMS symptoms such as muscle pain, cramps, mood swings, and fatigue. Vitamin D and omega-3 deficiencies are associated with systemic inflammation, muscle fatigue, and worsening mood swings . And high consumption of simple sugars (from sugary foods/drinks) can worsen PMS symptoms because it causes blood glucose fluctuations, inflammation, and increased fluid retention.

Previous research has found that athletes with poor nutritional status due to low intake of micronutrients (such as magnesium, calcium, and omega-3s) have more severe PMS symptoms and are unable to maintain maximum performance. However, some of them can still maintain sufficient performance, especially if the duration of PMS is short or the exercise is not too heavy (Wahyuningsih and Susilo, 2020). Then research by Putri and Lestari (2021) stated that excessive sugar consumption and lack of vitamin D exacerbate fatigue, pain, and emotional fluctuations during PMS.

Athletes with less than 2 years of experience do not have enough resilience or endurance and understanding of the body to maintain maximum performance when experiencing these symptoms. Athletes are not used to adjusting their training patterns to the menstrual phase or have not understood how to manage the emotional fatigue that may still appear even with mild symptoms. This shows that experience is very influential in shaping adaptability, not only to strenuous exercise, but also to internal body conditions such as STDs.

Meanwhile, in athletes with severe PMS, it does not always reduce athletes' performance. This is linked to supporting factors such as long-term training experience, which increases physical and mental tolerance to stress. Good nutrition, especially vitamin B6 intake which helps balance mood and lower jerks. Optimal hydration patterns and caffeine avoidance reduce the risk of severe PMS symptoms. As in athletes who experience severe PMS but have good performance, when nutritional status surveys are carried out, athletes often consume foods rich in vitamin B6 such as bananas, chicken, do not consume caffeine, drink 8 glasses of water/day and increase the frequency of drinking while training. Meanwhile, athletes who experience severe PMS but have sufficient performance for the most part Athletes rarely or < 2x/week consume calcium sources such as milk and processed products, rarely consume magnesium-rich foods such as spinach and nuts, rarely consume fruits and vegetables, rarely consume omega-3 fatty acids such as salmon and sardines, often or 2-3x/week consume drinks/sugary foods such as cakes, boba, thai tea, and most do not consume vitamin D.

Overall, the variation in the performance of female martial artists in various levels of PMS symptoms suggests that performance can be influenced by various aspects, especially physiological aspects. A balanced diet rich in complex carbohydrates, fiber, and vitamins and minerals, especially vitamin B6 (bananas, potatoes, spinach, and fish such as salmon and tuna), magnesium (nuts, seeds, leafy greens, and pumpkin seeds), and calcium (low-fat dairy products, fatty fish, and sun exposure for

vitamin D synthesis), can help reduce PMS symptoms. Low nutritional awareness among female athletes is still a major challenge in supporting optimal performance, especially when facing the menstrual cycle. Athletes tend to focus more on physical exercise without paying attention to the fulfillment of appropriate nutrition. Therefore, it is recommended to the trainer or research place, namely the Nganjuk Regency Martial Arts Pavilion, to facilitate female martial arts athletes to consult with competent health workers through cooperation with primary health services when STDs occur. This aims to minimize PMS symptoms and maintain optimal training and competition performance while preventing the risk of injury due to changes in body condition.

V. CONCLUSIONS AND SUGGESTIONS

1. CONCLUSION

Based on the results of the research on Premenstrual Syndrome Symptoms that Affect the Performance of Female Martial Arts Athletes in Nganjuk Regency, it can be concluded as follows:

- Symptoms of Premenstrual Syndrome in Female Martial Athletes Most experience severe Premenstrual Syndrome symptoms .

Performance in Women's Martial Athletes mostly has sufficient performance when experiencing Premenstrual Syndrome.

The more severe the PMS symptoms experienced, the more likely it is to experience a decrease in performance.

2. SUGGESTION

For Women's Martial Arts Athletes

Attention should be paid to a balanced nutritional pattern during STDs, including increasing the intake of iron, magnesium, and vitamin B6 to help reduce physical and emotional symptoms. Athletes are also encouraged to maintain hydration, monitor the menstrual cycle regularly, and adjust the intensity of exercise according to the body's condition during PMS.

Divide Research Places

It should facilitate female athletes to consult with competent health workers through cooperation with primary health services when STDs occur. This aims to minimize PMS symptoms and maintain optimal training and competition performance while preventing the risk of injury due to changes in body condition.

For Other Researchers

It should be used as further research with a larger sample number and more varied variables so that the research can be generalized.

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