



## **Effectiveness of Pumpkin Seed (*Cucurbita moschata*) Extract in Reducing Premenstrual Syndrome Symptoms in Adolescent Girls**

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### **ABSTRACT**

*Premenstrual Syndrome (PMS) is a common condition among adolescent girls, characterized by physical and emotional complaints that can interfere with daily activities. In Indonesia, the prevalence of PMS is reported to reach approximately 85% among women of reproductive age, with 60–75% experiencing moderate to severe PMS. This study aimed to evaluate the effectiveness of pumpkin seed extract (*Cucurbita moschata*) in reducing PMS symptoms in adolescent girls. A quantitative approach was applied using a true experimental design with a pre-test and post-test control group design. The study population consisted of adolescent girls experiencing PMS in the Poltekkes Kemenkes Semarang area. A total of 42 respondents were selected using randomized clinical trial sampling and divided into three groups: intervention 1 (pumpkin seed extract 500 mg, twice daily), intervention 2 (500 mg, once daily), and a control group receiving 500 mg amylum tablets once daily for 10 days. The results showed that administration of pumpkin seed extract at a dose of 500 mg twice daily for 10 days produced the most significant reduction in PMS symptoms ( $p = 0.000$ ; mean = 23.07). Pumpkin seed extract has potential as an effective natural therapy to alleviate PMS symptoms in adolescent girls.*

**Keywords: Adolescent girls, Symptoms, Premenstrual Syndrome, Pumpkin Seed Extract**

## INTRODUCTION

Women of reproductive age are defined as those between 15 and 49 years old, who are in the reproductive phase with fully functional reproductive organs. During this period, the probability of becoming pregnant reaches approximately 95%, then decreases to 90% in the thirties, and drops significantly to around 40% by the age of 40. Fertility in women spans a shorter period compared to men, with peak fertility occurring between 20 and 29 years of age. Therefore, women of reproductive age need to maintain and care for their reproductive health and personal hygiene, including undertaking early detection efforts for cervical cancer (Suartini et al., 2021).

Premenstrual Syndrome (PMS) is a collection of physical, emotional, and behavioral symptoms experienced by women of reproductive age, occurring repeatedly during the 7–10 days preceding menstruation (Prabandari et al., 2023). A study conducted in Indonesia reported that among 260 women of reproductive age, approximately 95% experienced at least one symptom of Premenstrual Syndrome (PMS). The age group most affected by PMS was between 20 and 24 years. In addition to age, the occurrence of PMS is influenced by several other factors,

including stress levels, individual characteristics, nutritional status—particularly obesity—and patterns of physical activity or exercise (Soimah, 2020).

Premenstrual Syndrome (PMS) is a condition characterized by the occurrence of various physical, emotional, and behavioral symptoms in women of reproductive age, which repeatedly appear during the 7–10 days prior to the onset of menstruation (Husna et al., 2022). A study in Indonesia found that among 260 women of reproductive age, approximately 95% experienced at least one symptom of Premenstrual Syndrome (Suartini et al., 2021). The age group most vulnerable to Premenstrual Syndrome (PMS) is between 20 and 24 years. In addition to age, the occurrence of PMS is influenced by several other factors, including psychological stress, individual characteristics, nutritional status—particularly obesity—and the patterns and intensity of physical activity or exercise (Lumingkewas et al., 2021).

Pain experienced during the Premenstrual Syndrome (PMS) phase can be influenced by various factors, including hormonal changes, stress levels, daily life conditions, and lifestyle patterns (Mukaromah, 2024). PMS itself is a collection of physical,

emotional, cognitive, and behavioral symptoms that occur approximately 7–10 days before menstruation and subside once menstrual bleeding begins (Al Afdiyan & Rahmansyah, 2023). The emergence of these symptoms is closely related to fluctuations in estrogen and progesterone levels during the menstrual cycle, which are further influenced by psychosocial factors such as stress, life burdens, and lifestyle. Several studies have also shown that mental health plays a significant role, as stress experienced by women can exacerbate the intensity of PMS symptoms. Physiologically, stress is known to affect the release of beta-endorphins, thereby contributing to the occurrence of premenstrual complaints (Yunita et al., 2021).

The prevalence of Premenstrual Syndrome (PMS) in Indonesia has been reported to reach approximately 85% among women of reproductive age. Of this population, around 60–75% experience PMS at a moderate to severe level (Wijayanti et al., 2022). To date, national data on the incidence of Premenstrual Syndrome (PMS) in Indonesia have not been comprehensively reported. However, based on several studies conducted, the prevalence of PMS is estimated to range between 30% and 50% across various groups of women (Astikasari & Kofi, 2022). Specifically, the prevalence of

Premenstrual Syndrome (PMS) in Central Java Province has not been precisely documented. However, a study conducted in Semarang City, Central Java, reported that 62% of female students experienced PMS at a moderate level, while approximately 20% experienced PMS at a severe level (Daniartama et al., 2021).

Government efforts to address Premenstrual Syndrome (PMS) have been carried out through various initiatives aimed at improving adolescents' knowledge and skills in managing premenstrual symptoms. One such intervention is the development of the Adolescent-Friendly Health Services Program (PKPR). This program focuses on providing health services that are both accessible and specifically tailored for adolescents, including health education and counseling activities, with the goal of enhancing adolescents' understanding and ability to manage PMS (Sari & Husaidah, 2021).

Health education specifically designed to focus on Premenstrual Syndrome (PMS) can enhance adolescents' understanding of the symptoms and appropriate management strategies. Furthermore, broader counseling programs involving various stakeholders, such as teachers, healthcare professionals, and parents, have the potential to strengthen adolescents' knowledge about PMS (Yunita et al.,

2021). More detailed and targeted data collection is also necessary to gain a deeper understanding of the factors associated with the occurrence of PMS. In addition, the development of comprehensive health programs focused on PMS can help enhance both knowledge and skills among adolescents in managing premenstrual complaints. The use of technology through digital media and online platforms also serves as an effective strategy to reach adolescents and improve access to information regarding PMS (Italia & Ramona, 2021).

Premenstrual Syndrome (PMS) that is not prevented or properly managed can have various impacts on different aspects of life. PMS affects the quality of life of adolescent girls by causing discomfort, limiting daily activities, and triggering mood changes (Nafi'ah et al., 2025). This condition can affect social relationships and performance, as the emotional and physical disturbances experienced may hinder communication and reduce the ability to interact with others. Consequently, adolescents' productivity in learning activities and other daily tasks may also decline (Italia & Ramona, 2021).

The acute effects of Premenstrual Syndrome (PMS) can vary among individuals, but they generally manifest as significant physical, behavioral, and emotional symptoms. Specifically,

common physical complaints include breast pain or swelling, temporary weight gain, headaches, swelling of the hands or feet, muscle aches, abdominal cramps, bloating, acne, as well as gastrointestinal disturbances such as diarrhea or constipation (Nisa et al., 2024).

The intake of certain nutrients that can help alleviate menstrual pain includes vitamin B6, potassium, magnesium, and calcium. Vitamin B6 can be obtained from foods such as eggs, bananas, and meat, while potassium is abundant in bananas. Magnesium is commonly found in meat and green vegetables, and calcium can be sourced from dairy products such as yogurt. Consuming foods rich in these nutrients plays a role in reducing discomfort during menstruation, including abdominal cramps and bloating (Evani & Sugiatmi, 2024).

Pumpkin seeds are a nutrient-rich food that can help alleviate symptoms of Premenstrual Syndrome (PMS). One of their main components is protein. The protein in pumpkin seeds plays a role in maintaining hormonal balance in the body, which is often disrupted during the premenstrual phase. Additionally, protein helps strengthen muscle tissue and reduce fatigue commonly experienced during PMS.

Pumpkin seeds contain various vitamins and minerals, including vitamin B, vitamin

E, as well as minerals such as potassium, magnesium, and phosphorus. These nutrients play a role in maintaining overall health while also helping to alleviate PMS-related complaints, such as headaches, muscle pain, and fatigue (Ariani et al., 2023). In addition, pumpkin seeds are also a good source of dietary fiber, which supports digestive system health. During the premenstrual phase, digestive disturbances such as constipation or diarrhea frequently occur, and fiber intake can help stabilize digestive function and alleviate these complaints (Ananda et al., 2022).

## METHOD

This study employed a quantitative approach with a true experimental design using a pre-test and post-test control group design. This design was used to evaluate the effectiveness of pumpkin seed extract

in reducing premenstrual syndrome symptoms. The study population consisted of all adolescent girls experiencing PMS in the Poltekkes Kemenkes Semarang area. A total of 42 respondents were selected using randomized clinical trial sampling. The study was conducted across three treatment groups: intervention 1 (pumpkin seed extract 500 mg, twice daily), intervention 2 (500 mg, once daily), and a control group receiving 500 mg amylum tablets once daily for 10 days. The research instrument used to assess symptom levels before and after intervention was the Shortened Premenstrual Assessment Form (SPAF). Ethical approval was obtained from the Health Research Ethics Committee of Poltekkes Kemenkes Semarang, with reference number 1185/EA/F.XXIII.38/2024.

## RESULTS AND DISCUSSIONS

### Result

**Table 1. Analysis of Differences in Premenstrual Syndrome Levels in Adolescent Girls Before and After Administration of Pumpkin Seed Extract (*Cucurbita moschata*)**

PMS Symptoms	Intervention 1	Intervention 2	Control	<i>p-value</i>
	Mean±SD	Mean±SD	Mean±SD	
Pretest	37.93±7.549	26.14±4.055	20.57±5.244	0.000**
Posttest	14.86±3.676	22.71±4.046	18.64±4.325	0.000**
<i>p-value</i>	0.000*	0.002*	0.035*	
Δ	23.07±9.417	3.43±3.368	1.93±3.075	0.000***

\*Paired T-Test \*\*One Way Anova \*\*\*Kruskal Wallis

Based on Table 1, the analysis results indicated a significant difference in Premenstrual Syndrome levels in adolescent girls before and after the

administration of pumpkin seed extract (*Cucurbita moschata*). In intervention group 1, which received pumpkin seed extract 500 mg twice daily for 10 days, the

mean PMS level at pretest was 37.93 and decreased significantly to 14.86 at posttest, with a p-value of 0.000 based on the Paired T-Test. The mean delta reduction of 23.07 demonstrates the high effectiveness of the intervention.

In intervention group 2, which received pumpkin seed extract (*Cucurbita moschata*) 500 mg once daily for 10 days, the mean PMS level decreased from 26.14 at pretest to 22.71 at posttest, with a p-value of 0.002. The mean delta reduction of 3.43 was smaller compared to intervention group 1.

Meanwhile, in the control group, which received anylum capsules 500 mg once daily for 10 days, the mean PMS level decreased from 20.57 to 18.64, with a p-value of 0.035 and a mean delta reduction of 1.93.

Statistical analysis using One-Way ANOVA on the pretest and posttest groups showed a p-value of 0.000, indicating a significant difference in Premenstrual Syndrome levels among the three groups. Analysis of the delta using the Kruskal-Wallis test also yielded a p-value of 0.000. These results demonstrate that the intervention with pumpkin seed extract (*Cucurbita moschata*) produced significant effects, with intervention group 1 showing the greatest reduction in PMS levels compared to intervention group 2 and the control group. This indicates that a higher dose of pumpkin seed extract is more effective in alleviating Premenstrual Syndrome symptoms.

**Table 2. Post Hoc Analysis of Premenstrual Syndrome Levels in Adolescent Girls Before and After Administration of Pumpkin Seed Extract (*Cucurbita moschata*)**

Variable	<i>p-value</i>	Significance
PMS Symptoms Pretest		
Intervention 1 >> Intervention 2	0.000*	Significant
Intervention 1 >> Control	0.000*	Significant
Intervention 2 >> Control	0.015*	Significant
PMS Symptoms Posttest		
Intervention 1 >> Intervention 2	0.000*	Significant
Intervention 1 >> Control	0.017*	Significant
Intervention 2 >> Control	0.011*	Significant
PMS Symptoms Delta		
Intervention 1 >> Intervention 2	0.000**	Significant
Intervention 1 >> Control	0.000**	Significant
Intervention 2 >> Control	0.400**	Not Significant

\*LSD \*\*Dunn Test

Based on Table 2, the post hoc analysis using the Least Significant Difference (LSD) and Dunn Test methods showed a significant difference in Premenstrual

Syndrome (PMS) levels in adolescent girls before and after the administration of pumpkin seed extract (*Cucurbita moschata*).

For the pretest Premenstrual Syndrome (PMS) levels, there were significant differences between intervention group 1 and intervention group 2 (p-value = 0.000), intervention group 1 and the control group (p-value = 0.000), as well as between intervention group 2 and the control group (p-value = 0.015). This indicates that before the intervention, there were notable differences in PMS levels among the groups.

For the posttest Premenstrual Syndrome (PMS) levels, the analysis showed significant differences between intervention group 1 and intervention group 2 (p-value = 0.000), intervention group 1 and the control group (p-value = 0.017), as well as between intervention group 2 and the control group (p-value = 0.011). These results indicate that the administration of pumpkin seed extract had a significant effect on reducing PMS

levels, with intervention group 1 showing better outcomes compared to intervention group 2 and the control group.

In the analysis of delta Premenstrual Syndrome (PMS) levels (the difference between pretest and posttest), significant differences were observed between intervention group 1 and intervention group 2 (p-value = 0.000), as well as between intervention group 1 and the control group (p-value = 0.000). However, no significant difference was found between intervention group 2 and the control group (p-value = 0.400). This confirms that intervention group 1, which received a higher dose of pumpkin seed extract, had the most significant effect in reducing PMS levels compared to the other groups.

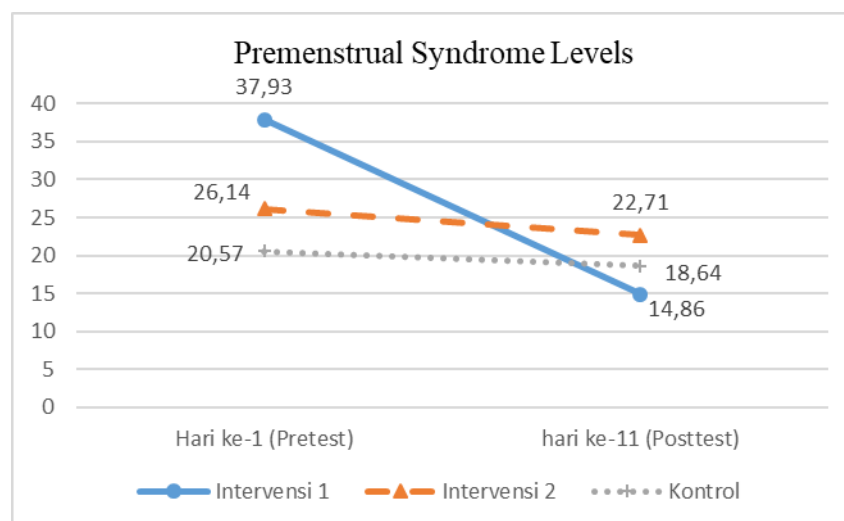


Figure 1. Mean Reduction in Premenstrual Syndrome Levels in Adolescent Girls Before and After Administration of Pumpkin Seed Extract (*Cucurbita moschata*)

## **Discussion**

Pumpkin seeds are rich in magnesium, iron, and tryptophan. Magnesium plays an important role in the reproductive system and can help relax muscles, potentially reducing dysmenorrhea (menstrual pain) and PMS symptoms. In 100 grams of pumpkin seeds, there are approximately 569 mg of magnesium and 9 mg of iron, which can contribute to alleviating PMS symptoms.

Studies have shown that the consumption of pumpkin seed-based biscuit products can increase the intake of micronutrients such as zinc and iron in adolescents. Although these studies did not directly measure the effect on PMS, the increased iron levels may contribute to the reduction of PMS-related symptoms (Jelmila et al., 2023).

Other studies have found that pumpkin seed extract can improve sleep quality in mice, which is relevant since poor sleep quality often exacerbates PMS symptoms. The nutrients in pumpkin seeds show potential for alleviating PMS symptoms. For example, magnesium is known to help relieve menstrual cramps and other related discomforts (Mutia et al., 2024).

The administration of pumpkin seed extract may have a positive effect in reducing PMS symptoms in adolescent girls due to its nutritional content, particularly magnesium and iron (R et al.,

2024). However, further research is needed to directly assess its impact on PMS levels.

## **CONCLUSION**

The administration of pumpkin seed extract (*Cucurbita moschata*) in intervention groups 1 and 2, as well as the control group, significantly reduced premenstrual syndrome symptoms in adolescent girls, with the most significant effect observed in intervention group 1, which received a dose of 500 mg twice daily for 10 days.

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