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Do Menstrual Hygiene Practices, Premenstrual Syndrome, and Mood Swings differ for Female Students in Sports with those Non-Sports Extracurriculars ?

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ABSTRACTS

Purpose: Menstrual health is a significant component of women's lives that is frequently disregarded, particularly when it comes to extracurricular activities. The objective of this study is to identify disparities in menstrual hygiene practices, premenstrual syndrome, and mood swings among female students who participate in sports and those engaged in non-sports extracurricular activities.

Materials and Methods: This cross-sectional study involved 129 female students in senior high school, consisting of 60 students involved in sports extracurricular activities and 69 students not involved in non-sports extracurricular (age= 16.62 ± 0.77 y.o., height= 155.24 ± 5.15 cm, weight= 47.26 ± 8.29 kg, first menstrual period 12.49 ± 1.21 y). The present study employed instruments socio-demographic characteristics, as well as validated questionnaires on menstrual hygiene practices, premenstrual syndrome (PMS), and mood swings.

Result: The results showed that poor menstrual hygiene practices in students who participated in extracurricular sports with those who did not participate in sports activities were 29 and 35 students, respectively. Students who were involved in non-sports activities exhibited more severe and moderate symptoms of PMS compared to sports students. Additionally, sports students experienced more positive mood swings, while non-sports students reported more negative mood swings. Furthermore, significant differences between female students engaged in sports and those involved in non-sports extracurricular activities were only found in mood swings, neither in menstrual hygiene practices (0.910) nor PMS symptoms (0.776).

Conclusion: Schools should promote female students' participation in sports to enhance their emotional well-being. Additionally, they should emphasize menstrual hygiene education and awareness to ensure proper practices among all students. Developing targeted interventions to help students manage PMS symptoms and maintain positive mood swings is also crucial for improving menstrual health and emotional well-being among adolescents.

Keywords: Period; Menstrual health; Emotional wellbeing; Adolescent; Sports participation.

INTRODUCTION

Menstruation is a physiological process occurring in women during adolescence, indicating the proper functioning of the reproductive organs (Villasari, 2021). Menstruation, often known as menstrual bleeding, is the regular shedding of the uterine lining, known as the endometrium, which happens approximately every four weeks (Isriana, 2016). Menstruation, also known as the

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shedding of the endometrium, is a monthly process in women where the inner layer of the uterine wall is expelled. This process typically lasts 5-7 days and involves the release of blood from numerous blood vessels (Kemenkes, 2018). The onset of menarche generally happens between the ages of 11 and 14, although some women may experience their first menstruation as early as 9 years old, with the variation attributed to factors such as lifestyle factors, which menstrual bleeding generally occurs for 2 to 7 days, with an average cycle length of approximately 28 days (Umniyati, 2020). Adolescent women who have started menstruating are very highly susceptible to reproductive organ infections due to their inadequate personal hygiene practices, particularly during menstruation (Pythagoras, 2018). Women, particularly adolescents, sometimes overlook the importance of maintaining cleanliness during menstruation due to insufficient awareness about reproductive health, which can lead to a lack of personal hygiene practices, which in turn can lead to reproductive health issues (Sinaga, 2017). It is crucial to address adequate hygiene practices during menstruation in young women to prevent potential reproductive health complications that may have severe consequences in the future (Sugiharto, Nugroho, & Purwanto, 2020).

Aside from monthly hygiene concerns, women also experience premenstrual syndrome (PMS), which remains a prevalent health condition among women of reproductive age globally (Hofmeister, 2016). Premenstrual syndrome (PMS) is characterized by a combination of emotional, physical, and behavioral symptoms that occur during the luteal phase of the menstrual cycle and typically subside within a few days after menstruation, vary in severity from moderate to severe and are believed to be influenced by hormonal factors (Liu et al.,, 2017; Ryu & Kim, 2015). Moreover, the level of severity for PMS symptoms encountered differs among individuals; the predominant symptoms of premenstrual syndrome are anxiety problems, melancholy, restlessness, exhaustion, reduced focus, discomfort, breast swelling, and stomach pain (Ramadani, 2012). On the other hand, women also experience emotional fluctuations during the menstrual cycle, frequently accompanied by negative feelings such as increased irritability and sensitivity, which can significantly worsen symptoms of PMS, highlighting the vulnerability of emotions in this context (Yamazaki & Tamura, 2017). Approximately 75% of women who menstruate report experiencing PMS, with a higher prevalence among young women (Akoku et al., 2020; Chocano-Bedoya et al., 2013; Minichil et al., 2020). Additionally, about 80% of women report experiencing mood swings and physical symptoms before menstruation, which can negatively impact their relationships, daily activities, work productivity, and overall physical health (Schoep et al., 2019). Severe mood swings can significantly disrupt an individual's conduct, particularly throughout adolescence, when moods tend to vary or become unstable (Addiniyah, 2019). Fluctuations in mood are prevalent among menstruating women, often accompanied by feelings of irritability; these changes manifest through alterations in facial expressions, speech patterns, and exhibited attitudes or behaviors (Monitha et al., 2021).

During intense and exhausting training, athletes or sports enthusiasts commonly disregard their menstrual hygiene routines, which can increase the risk of sickness (Jinko, Michiko, Toshiko, Fumi, & Keiko, 2021). The study conducted by Pardela (2019) revealed that female students involved in volleyball extracurricular activities often experience decreased training activities during menstruation, including increased rest periods, reduced activity levels, diminished focus, fluctuating emotions, and fatigue, which affect both individual and team playing patterns and can disrupt training sessions. This study is consistent with Khalilipour and Panahi (2017), that some

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female athletes experience fluid retention and abdominal cramps before and during menstruation, which impairs their training and performance in competition, ultimately affecting their overall quality of life. Prior research has investigated menstrual hygiene, premenstrual syndrome, and mood swings in female teenagers individually without distinguishing the influence of specific extracurricular activities on these factors. Consequently, there needs to be more comprehension regarding the impact of engaging in various extracurricular activities on the menstrual experiences and mental well-being of female students. Furthermore, there is a scarcity of research that particularly examines menstrual hygiene practices, premenstrual syndrome, and mood swings in those participating in sports extracurricular activities as compared to those who do not participate in sports. Hence, this study holds great significance in offering a profound understanding of how extracurricular activities can substantially impact female students' menstrual experiences and mental well-being, which can contribute to developing effective policies on extracurricular activities and health in educational institutions.

METHODS

Study Participants: This cross-sectional study included 129 female students in senior high school, comprising 60 students involved in sports extracurriculars and 69 students not engaged in non-sports activities. We employed probability sampling as our technique to ensure that every female student had an equal chance of being selected as a research participant.

Study Organization: We collected data using a questionnaire consisting of four main sections. The first section collected sociodemographic information, including age, height, weight, body mass index, age at first menstruation, duration of menstruation, initial feelings about menstruation, and sources of information about menstruation. Assessment of menstrual hygiene practices, using a questionnaire from Hennegan et al. (2020) encompassing 31 questions regarding materials used, changes in practices, hand washing, washing genitals, disposal, storage, washing and drying materials, sterilization, and toilet practices. These practices were evaluated using a four-point Likert scale and categorized as good (score > 93.1) or poor (score ≤ 93) based on the mean and standard deviation. PMS used the Premenstrual Syndrome Scale (PMSS) instrument, which consisted of 40 questions divided into physiological, psychological, and behavioral symptoms, with symptoms classified from none to extremely severe based on the total score. Furthermore, an instrument adapted from a study by Brandt et al. (2016) was used to evaluate mood changes during menstruation. It comprises 6 subscales: anger, tension, depression, vigour, fatigue, and confusion. The total number of items is 24, with each subscale consisting of four queries that are rated on a numerical scale from zero to four (0 = not at all, 1 = a bit, 2 = moderate, 3 = enough, 4 = extremely). Subsequently, the average score and standard deviation (SD) are then used to classify the aggregate calculation results obtained from the questionnaire. Mood swings are classified into two categories: positive (x ≤ 59) and negative (x > 59).

Participants will be given those instruments as part of the research and receive information on the study's aims. Subsequently, they will be asked to fill out a consent form to take part. In addition, participants are given instructions on how to complete a survey on socio-demographic characteristics. They are also asked to assess their menstrual hygiene practices, premenstrual syndrome, and mood swings experienced during menstruation. Participants are also informed that there are no correct or incorrect answers. The data gathering was conducted from May to August 2023.

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Statistical Analysis: We employed Microsoft Excel to collect and clean data. Subsequently, SPSS 29 was used to perform statistical analysis. The descriptive data pertaining to the socio-demographic respondents, their menstrual hygiene practices, PMS, and mood swings are reported in mean ± SD, frequency, and percentage, displayed in tables and graphs. In addition, an independent t-test was employed to analyze the differences between female students in sports and those in non-sports extracurriculars, with a significance level of p = 0.05.

RESULT

The majority of students in sports and non-sports extracurricular activities are slightly different, but they present some similarities (Table 1). Students who participate in extracurricular sports activities have an average age of 16.67 years, a body weight of approximately 49.11 kg, and a height of 156.28 cm. Conversely, students who participate in extracurricular activities that are not sports-related have an average age of 16.58 years, a body weight of 45.65 kg, and a height of 154.33 cm. The average Body Mass Index (BMI) of students participating in extracurricular sports is 15.7 kg/m², while non-sports students have an average BMI of 14.77 kg/m². Most students in both groups are classified as severe thinness, with 63.34% in sports and 75.37% in non-sports. Only a small number of students are classified as normal, with 15% in sports and 4.35% in non-sports. The average age of menarche was nearly identical for both groups: 12.5 years for sports and 12.49 years for non-sports. Additionally, the larger number of students in both categories experienced menstruation for 4-6 days, with 68.33% of students in the sports group and 56.52% in the non-sports group. A similar pattern was observed in the emotions of the majority of students during their first menstruation. The majority of students reported feeling uncomfortable (40% for sports and 43.47% for non-sports), followed by feelings of normality (35% for sports and 23.2% for non-sports), fear (16.67% for sports and 27.53% for non-sports), and shame (8.33% for sports and 5.8% for non-sports).

In both categories, the primary source of information regarding menstruation was the mothers of most students, with 80% of students in the sports group and 68.12% in the non-sports group. Other sources of information included electronic media, grandmothers, the Internet, and friends, with lesser percentages. Students who participate in extracurricular sports activities are more likely to obtain information from friends (10.01%), grandmothers (3.33%), the Internet (3.33%), and electronic media (3.33%). Conversely, students who are not involved in sports are more likely to obtain information from the Internet (13.04%), friends (10.14%), electronic media (7.25%), and grandmothers (1.45%).

The students who participated in sports extracurricular activities had significantly higher weight, height, and BMI than those who participated in non-sports extracurricular activities. However, there were no significant differences in terms of age, age of menarche, duration of menstruation, feelings at first menstruation, and sources of information about menstruation between the two groups.

Table 1. Sociodemographic characteristics of the participants

Characteristics	Students		P (sig)
	Sports Extracurricular (n = 60)	Non-Sports Extracurricular (n = 69)	
Age (year, mean ± SD)	16.67 ± 0.79	16.58 ± 0.75	0.626
Bodyweight (kg; mean ± SD)	49.11 ± 8.77	45.65 ± 7.54	0.017*

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Characteristics	Students		P (sig)
	Sports Extracurricular (n = 60)	Non-Sports Extracurricular (n = 69)	
Height (cm; mean ± SD)	156.28 ± 4.98	154.33 ± 5.92	0.031*
Body Mass Index (BMI) (kg/m2; mean ± SD)	15.7 ± 2.66	14.77 ± 2.26	0.035*
BMI category (n, %)			
Normal	9 (15)	3 (4.35)	
Moderate thinness	11 (18.33)	7 (10.14)	0.041**
Mild thinness	2 (3.33)	7 (10.14)	
Severe thinness	38 (63.34)	52 (75.37)	
Age of first menstruation (year, mean ± SD)	12.5 ± 1.26	12.49 ± 1.17	0.973
Duration of menstruation (days; n, %)			
1 – 3	1 (1.67)	2 (2.9)	0.379
4 – 6	41 (68.33)	39 (56.52)	
> 6	18 (30)	28 (40.58)	
Feeling on first period (n, %)			
Shy	5 (8.33)	4 (5.8)	
Normal	21 (35)	16 (23.2)	0.304
Affraid	10 (16.67)	19 (27.53)	
Uncomfortable	24 (40)	30 (43.47)	
The primary source of information regarding menstruation (n, %)			
Grand mother	2 (3.33)	1 (1.45)	
Mother	48 (80)	47 (68.12)	0.234
Friend	6 (10.01)	7 (10.14)	
Internet	2 (3.33)	9 (13.04)	
Electronic media (TV, radio, newspapers, etc.)	2 (3.33)	5 (7.25)	

*significant different using a t-test ($p<0.05$)

**statistically significant using the Chi-Square test ($p<0.05$)

Generally, Figure 1 demonstrates a nearly equal distribution of menstrual hygiene practices across adolescents participating in sports and non-sports extracurricular activities, with the majority displaying comparable outcomes. The sports extracurricular group, which includes volleyball, basketball, futsal, martial arts (karate, taekwondo, perisai diri, pencak silat), hockey, and badminton, with the the largest number of participants involved in volleyball, showed 31 students with good hygiene practices, and 29 fell into the poor category. In contrast, the non-sports group had 34 students with good hygiene practices and 35 students with poor hygiene practices. Regarding premenstrual syndrome, students who engaged in non-sports extracurricular activities exhibited more severe symptoms (21) and moderate symptoms (36) compared to those who participated in sports extracurricular activities. In addition, students who engaged in sports extracurricular activities had a greater number of positive mood swings (36) compared to those in non-sports extracurricular activities, who reported a higher frequency of negative mood swings 42).

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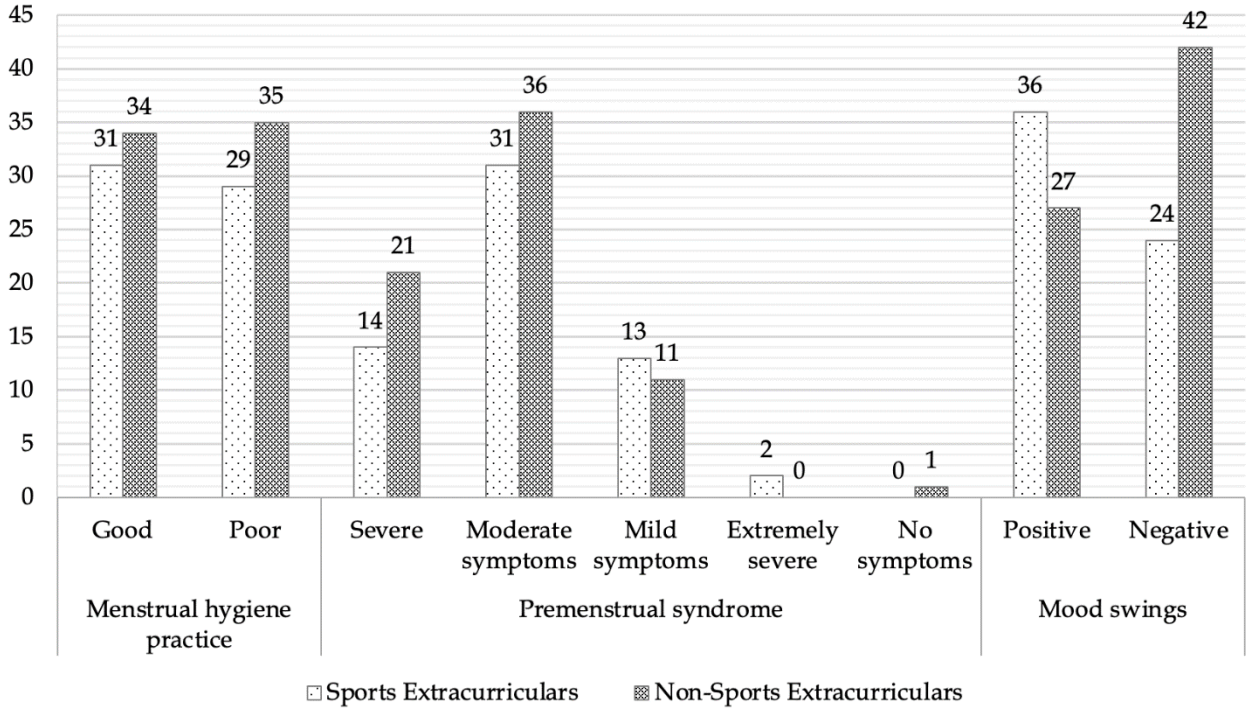

Figure 1. Menstrual hygiene practice, premenstrual syndrome, and mood swings among female students in sports and non-sports extracurriculars.

The findings from the independent samples t-test revealed a notable difference in mood swings between female students engaged in sports and those involved in non-sports extracurricular activities (0.034), with female students who participated in sports showing positive outcomes. However, there were no significant differences between the two groups in terms of menstrual hygiene practices and premenstrual syndrome (Figure 2).

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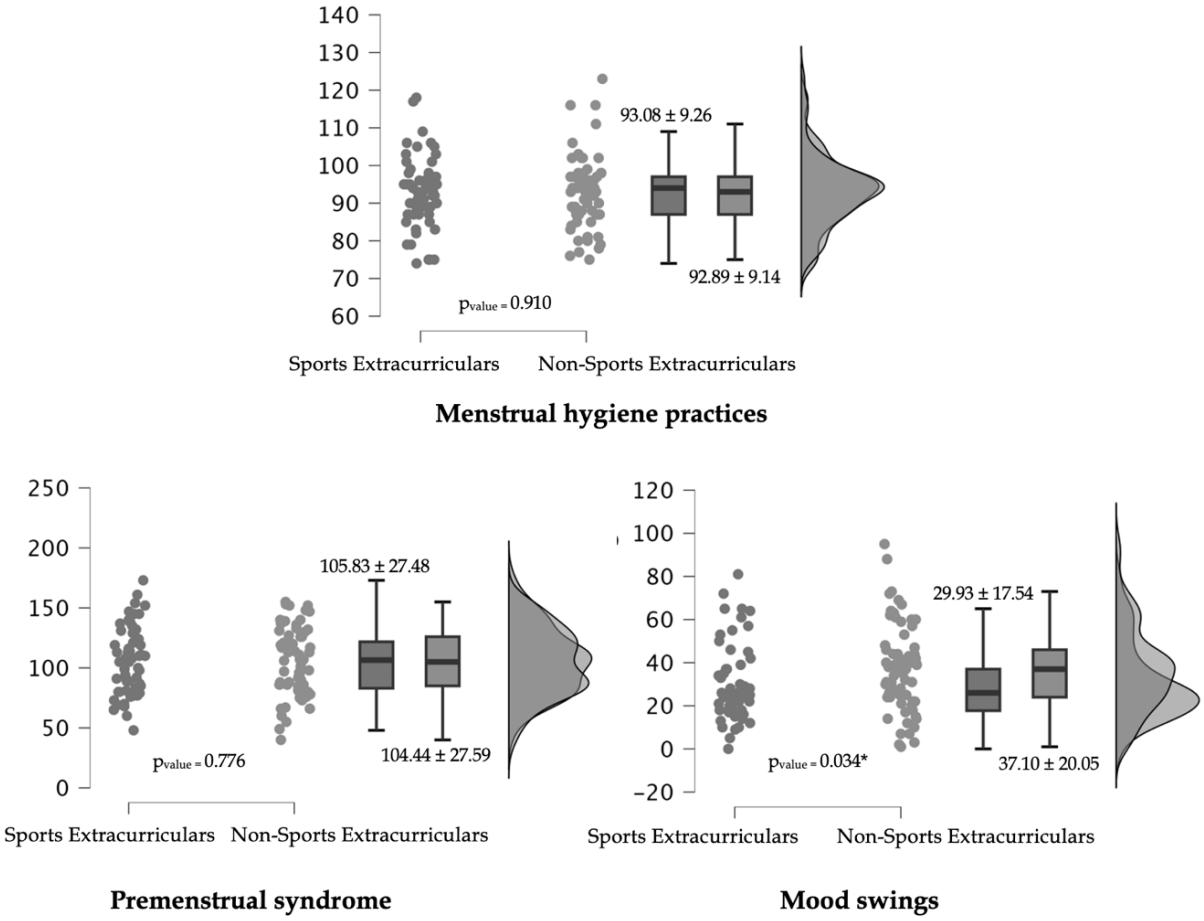

Figure 2. Differences in menstrual hygiene practice, PMS, and mood swings in female students who participate in sports and those in non-sports extracurricular.

DISCUSSION

The study aimed to identify the differences in engagement between sports and non-sports extracurricular activities regarding menstrual hygiene practices, PMS, and mood swings in female students. This study found no significant difference, and the majority of them tend to have inadequate menstrual hygiene practices between the female students in sports (48%) and the non-sports (51%). This suggests that participation in sports does not necessarily improve menstrual hygiene practices. Factors such as access to hygiene products and education on menstrual health might be more crucial in influencing these practice and can minimize reproductive infections (Pradeepkumar et al., 2019). In addition, health promotion initiatives in schools improve menstrual hygiene knowledge and practices (V.U. et al., 2021), change negative attitudes and perceptions about menstruation (Sood et al., 2022), and ensure that female students have the skills and resources they need to manage their menstruation healthily and hygienically (Thapa & Aro, 2021).

In addition, this present study showed no significant difference in PMS symptoms between female students involved in sports and those involved in non-sports extracurricular activities. Our study is in line with Czajkowska et al. (2019), who proved that in female rhythmic gymnasts with peers who did not play sports, there was no significant difference in the prevalence of PMS in the two groups. Premenstrual syndrome (PMS) is a common condition that affects women during the luteal phase of menstruation and is characterized by a variety of different physical, cognitive,

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emotional, and behavioral symptoms (Gudipally & Sharma, 2024). Previous studies have investigated the relationship between PMS and various factors, including physical activity, stress levels, personality traits, and lifestyle variables among female students (Dehghan, Kaboudi, & Khosravi, 2020; Yang et al., 2024), including the impact of PMS on academic performance (Alhawsawi & Shiekh, 2022), and psychological problems such as anxiety and depression (Chehreh et al., 2021). This proves that the type of extracurricular activities does not significantly affect the frequency or level of PMS in female students.

Our study proves that female students who participate in extracurricular sports show more stable and positive mood changes compared to those who do not. Supporting this, studies by Han et al. (2020) and Heikura et al. (2023) also explain the benefits of sports for mood stability and emotional well-being. In addition, Castanier et al. (2021) underline the very beneficial role of sports in regulating fluctuating hormones, while Aghababa et al. (2021) state that team sports can provide psychological benefits that have positive implications for mood changes. These findings make it clear that it is essential to encourage sports participation among female students to improve their emotional and mental health. Schools should also advocate for female students to be actively involved in sports activities because this not only improves physical health but also provides emotional benefits that can reduce stress and anxiety, as well as increase self-confidence and self-esteem. Exercise enhances cardiovascular health, regulates hormones, and increases endorphin production, reducing stress and PMS symptoms and improving mood stability. Those who participate in sports extracurriculars are likely to experience greater overall physical and mental well-being than those who do not.

Abbas et al (2018) underscore the importance of considering physical activity and emotional intelligence in understanding mood regulation among female students. While participation in sports appears to positively contribute to emotional stability (Dhar, Farooque, & Devi, 2024), comprehensive health education and access to resources are equally important for effective menstrual hygiene practices and PMS management. The study's limitation is that potential confounding factors have not yet been included, such as socioeconomic status, access to menstrual hygiene products, and cultural attitudes towards menstruation, which could influence menstrual hygiene practices and emotional well-being. Additionally, the study does not explore the role of peer or social support within extracurricular activities, which may also impact emotional well-being and menstrual health. Future research should adopt a holistic approach that integrates psychological, physiological, and educational perspectives while also considering factors like socioeconomic status, access to menstrual hygiene products, and social support to understand better their impact on menstrual hygiene and the health of female students, which is ultimate could enhance their health, well-being and academic success.

CONCLUSION

Our study investigated the differences in mood swings that tend to indicate better emotionality in female students participating in sports and extracurricular activities. This is due to sports can encourage the release of endorphins, which are natural mood lifters. Concerning this, sports participation is a powerful tool for promoting emotional stability in female students. Combining physical activity, social connections, and supportive environments reduces stress, improves mood regulation, and enhances mental well-being. Future research should explore sports involvement's

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psychological, physiological, and hormonal dimensions to understand its full impact on emotional stability and menstrual health.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest in this matter.

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