



## The Relationship Between Stress Levels and Premenstrual Syndrome Incidents

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### Abstract

Adolescence is a formative stage marked by emotional instability and biological changes, creating a complex intersection between psychological and physiological development. In this context, premenstrual syndrome (PMS) is not merely hormonal but also a psychosomatic response to psychosocial stressors. This study examined the relationship between perceived stress and PMS among 256 female students from Madrasah Aliyah Negeri in Makassar, Indonesia. Using a quantitative cross-sectional design, data were collected with the Perceived Stress Scale (PSS-10) and the Shortened Premenstrual Assessment Form (SPAF). Statistical analysis using Chi-square and binary logistic regression revealed a strong association between PMS and stress ( $p = 0.000$ ). The prevalence of PMS increased markedly with stress intensity, ranging from 6.7% among mildly stressed to 95.9% among severely stressed respondents. Stress emerged as a key predictor (AOR = 30.20 for moderate stress; AOR = 330.80 for severe stress), while adequate sleep and regular physical activity acted as protective factors. These findings suggest that adolescent stress manifests as embodied experiences influenced by educational and sociocultural expectations. In academically demanding and morally prescriptive environments, emotional distress often translates into somatic expressions. Thus, PMS may function as a covert form of communication an embodied narrative of unspoken emotional struggles. Effective management should therefore integrate stress reduction, menstrual health literacy, and emotional awareness, not only improving reproductive health but also validating adolescents' psychosocial realities.

## Introduction

Adolescence is a transitional crisis, a paradoxical period when the physiological changes in the body simultaneously introduce new body abilities, the cognitive maturing struggles with growing complexity (Uktamovna, 2025; Vygotsky, 2022; Vertel et al., 2023). In the case of young women, this shift is not only seen as a biological necessity, but as a social and affectionate wake up. One of the most explicitly spoken, though conspicuously practiced aspects of this change, the menstrual cycle is an inherent biological cycle designed to instill

pride and discomfort equally; it is a secretive concern and at the same time a reflection of the hidden burden of societal norms. In various cultural settings, such as Indonesia, menstruation seems to be pushed to the fringes of the education curriculum and everyday language, being under the control of cultural taboos rather than a thorough health literacy education (Natalis, 2025). Whilst this silence seems well-mannered, it has a substantive meaning: it disenfranchises young women facing the psychosomatic dynamics of their cycles the swings of mood, fatigue and corporeal change, without the affective language or institutional framework to explain such experiences (Madhur, 2024; Mandalaki, 2024; FitzGerald, 2025).

Premenstrual syndrome (PMS) is the most common yet common misconceived phenomenon in this interaction (Rathor & Rauf, 2024; Zhuo et al., 2025; Shamsalizadeh et al., 2025). PMS is described as the recurrent association of somatic and affective symptoms, which happens before menstruation and includes abdominal point of pain, sleep issues, aggravation, tension, and spontaneous sorrow. Even though it is medically defined, PMS cannot be reduced only to a physiological discourse; it occurs at the intersection of biology, psychology and culture. Its biological essence is determined by the hormonal changes and especially the estrogen and progesterone hormones, but its manifestation is extensively altered by the emotional climate in the environment. New studies assume that stress is a vital mediator (Yilmazer, 2024; Carr & Fleddermann, 2025; Yang et al., 2024). The hypothalamic-pituitary-adrenal (HPA) axis is in a chronic state of activation and raises cortisol, alters the release of gonadotropin-releasing hormone (GnRH) and destroys the homeostasis of reproductive hormones when the adolescent mind experiences a long-term state of tension caused by academic-related, family-related, and sociocultural pressure, which worsens PMS symptoms. As a result, PMS can be taken to imply not just a hormonal phenomenon, but the mode of expression of corporeal apparatus in dialogue with its affective milieu (Hansen, 2014; González et al., 2024).

This integrative view has been supported by recent empirical scholarship. Dozsa-Juhasz and co-authors (2023) carried out an extensive study on Hungarian females, which revealed that perceived stress level was a significant predictor of PMS severity, and the latter was moderated by regular physical activity, which highlights the body's ability to self-manage distress through behavioral therapy. Similar trends were noted by Nandakumar et al. (2023), who found that academic pressure and stress were among the most effective predictors of the presence of PMS among Indian university students. The study by Alshdaifat and colleagues (2022) focused on Jordanian medical students and found that more than 70 percent of the participants experience PMS symptoms and stress once again becomes the most prominent contributory factor. Although these studies are conducted in different cultural contexts, they all agree on one statement: stress and PMS are not accidental to each other but manifestations of a common psychosomatic reality. They also suggest something deeper, that the adolescent or young adult body is not a passive victim of stress but an active articulator, translator and sometimes even resister of stress.

In case the global scholarship has already started to unravel this association, the Indonesian context does have its layers of meaning (Revita et al., 2024; Fahm, 2024; Jatmikowati, 2024). In this case, it is adolescence that is saturated with cultural, educational, and religious demands. Schools especially those of a religious nature like Makassar City, Madrasah Aliyah Negeri (MAN) 1 serve as the place where discipline, moral growth as well as academic excellence meet. This compound set of demands, as it affects many young women, creates an internalized beat of pressure, that is, a day-to-day act of obedience and success. Within this setting, the stress is no longer an episodic response, but rather it becomes a structure, which forms part of the learning, assessment, and conformity processes. Once the inner world of emotional exhaustion or strain is not ventilated, then the body itself starts to say what might usually come across as mute. In this way, the teenage body is turned into a place of translation inputting the unseen expectations into material discomfort and psychological pressure into bodily rhythm.

To add to this, there is the cultural taboos around discussing menstruation and mental health. Despite the progress in national education programs, as regards raising awareness about reproductive health, the situation with respect to the emotional aspects of menstruation is still fragile (Arihla et al., 2024; Meena et al., 2024; Howard et al., 2025). Young women are hardly given systematic information on the effects of psychological stress on their cycles or do they feel that culturally acceptable to express menstrual distress publicly (Gibbons et al., 2024; Srinivasa Gopalan et al., 2024; Flores et al., 2025). This silence contributes to the perpetuation of a misunderstanding: PMS is suffered instead of analyzed; stress is tolerated instead of identified. In this situation, the connection between stress and PMS is not only a question of biomedical but a question of humanity as such, of the manner in which culture teaches young women to internalize and persevere in their plights as well as to externalize them. To interpret this dynamic, we need a method that sees adolescence not as a biological stage but as a highly relational experience, being influenced by education, religion and social identity (Dharani, 2025; Alam et al., 2025; Bartels et al., 2024).

The current research is the result of this realization. It attempts to examine stress and premenstrual syndrome in relation to adolescent female students in Madrasah Aliyah Negeri 1 Makassar City with an attempt not to medicalize their experience, but to shed light on it. Through exploring the relationship between stress and PMS in a structured religious educational framework, the study aims to give an insight to the relationship of the psychological and physiological experiences in the day-to-day lives of young Indonesian women. By so doing the study will add to the mounting interdisciplinary literature that sees health as not as the lack of illness but as a balance between emotion, body and environment. This study is based on adolescents as opposed to previous ones which mostly dealt with college or adult groups as a setting, the cultural and ethical context of Islamic education, where emotional restraint and social conformity can determine the way stress is perceived and embodied.

Finally, the research is based on a single belief: to understand the health of young girls, it is necessary to understand the ecosystems that surround them. Sinuous and far-reaching, social and profoundly human, they are the products rather than the causes of stress or PMS. This study attempts to expand the discussion on the well-being of adolescents in Indonesia by exploring its relationship with the existing view of hygiene and biology and shifting it to empathy, thought, and compassion. The adolescent body, with its disastrous cycles, is not only the site of pain, but a breathing record of experience. The process of listening to it, scientifically, culturally, and compassionately, can help not only identify the sources of discomfort but also the sources of resilience.

## **Methods**

The current research was carried out on June 2024, at Madrasah Aliyah Negeri (MAN) 1 Makassar City, and the main aim of the research was to determine the association between stress levels and the prevalence of premenstrual syndrome (PMS) in adolescent female students. The study took a quantitative study design that utilized a cross-sectional research design by allowing the researcher to capture the independent and dependent variables at a specified period of time. The choice of this design was under careful consideration as it allows the natural occurrence associations to be studied without interference or mediation making it especially effective to investigate psychosomatic phenomena like the relationship between stress and PMS. Furthermore, cross-sectional paradigm is a very effective data collection approach providing an effective way to identify large-scale data and make important connections that may be used in further in-depth or longitudinal studies.

The sample of study was all the female students attending MAN 1 Makassar City. Out of this population a total of 256 respondents were sampled using purposive sampling method. This

type of non-probability sampling was used to make sure that only those people who met predetermined requirements were included in the sample and it would maximize the internal relevance of the obtained data. The inclusion criteria were as follows: (1) students who are in the grades of X, XI and XII; (2) those students who volunteered to be a part of the study; and (3) students who were in school during the time of data collection. On the other hand, exclusion criteria included: (1) students who had never menstruated; and (2) students who had menstrual disorders. These criteria were aimed at ensuring that the participants were a sample that was biologically and psychologically relevant in the analysis of the correlation between stress and PMS.

Primary sources were used to collect data by applying two standardized instruments that are commonly used and acceptable, such as Perceived Stress Scale (PSS-10) and Shortened Premenstrual Assessment Form (SPAF). PSS-10 is a proven psychometric instrument that was developed to measure how stressful the lives of individuals are. It measures both cognitive and emotional reactions to perceived stress using a ten-item Likert scale, as such that gives a more subtle description of subjective stress experiences. The SPAF, on the contrary, is a very minimal but efficient tool to assess symptoms of PMS in three major areas: physical, psychological, and behavioral domains. These instruments were selected based on their extensive psychometric properties, as well as in terms of their ability to measure the multidimensional interactions between psychological stress and physiological reactions in adolescent populations.

Before the actual data collection, the researchers conducted a content validity test and internal reliability test to ensure that the contents were contextually relevant with the target population. The instruments were reviewed by psychological and reproductive health specialists to ensure that they were relevant and clear. The reliability test using Cronbachs Alpha actually revealed satisfactory internal consistency of both PSS-10 and SPAF thus ensuring that the instruments could actually be reliable in measuring the constructs being tested. This set of preliminary actions strengthened the methodological quality of the research and raised the confidence in the correctness of the data gathered.

The data collection was done in schools, under the supervision of the principal and teaching staff. The researchers provided a clear and detailed description of the purpose of the study, procedures, and ethical protection in the distribution of the questionnaires. The respondents were all participants on a voluntary basis, and the information on informed consent was provided in writing before the respondents completed the questionnaires. The questionnaires were to be given to the sample group in a calm, controlled classroom so as to maintain accuracy and minimize possible misinterpretations. This methodology allowed every student enough time and knowledge to give intelligent responses in the research environment in a respectful yet not intimidating manner.

The analysis of the data was carried out with the help of Statistical Package of the Social Sciences (SPSS). The analysis stage was carried out in two major steps. The initial analysis was a univariate analysis, which involved the frequency and percent distribution of the significant demographic and study variables, such as age, grade level, stress levels, and PMS occurrence. This descriptive study offered a summary of respondent data and general distribution of the variables under study. The second step was a bivariate analysis done using the Chi-square test to analyse the relationship between stress levels (dependent variable) and PMS incidence (independent variable). The Chi-square test was chosen since both variables were nominal. Significance level was set at  $p < 0.05$ , which means that the observed relationship could not have come about as due to chance.

In addition to quantitative computation, the analysis also involved an interpretive reflection that was aimed at relating the statistical outcomes to the whole theoretical framework of stress

and hormonal regulation. The researchers factored in the aspect of stress-related hormonal changes, especially the hormones of cortisol, serotonin, and progesterone that could be used to explain the differences in PMS symptoms among adolescent girls. It was an interpretation integration to use the findings of empirical research with the knowledge of concepts such that the analysis was not only likely to produce statistical correlations but also to bring insights to the psychosomatic health of adolescents.

Ethics was considered in the whole research process. Data collection was voluntary and the respondents were aware that they could withdraw any time without any academic or social consequences. In order to protect anonymity, no personal information about the respondents was gathered, and the responses had high levels of confidentiality. The school administration gave formal consent to the study, and teachers and staff members also played a significant role in making the data collection process a smooth and respectable one. The ethical and procedural integrity of the study also indicates the adherence to scientific validity and psychological well-being of the subjects because the investigators are sensitive to the ethical complications of studying the adolescent population.

## Result and Discussion

The analysis in this study explores the relationship between stress levels and the incidence of premenstrual syndrome (PMS) among 256 adolescent girls at Madrasah Aliyah Negeri (MAN) 1 Makassar City. The results are presented through a series of tables, each accompanied by detailed interpretation to illuminate the psychological, physiological, and sociocultural implications of the findings.

### Respondent Characteristics

Before a discussion of the nexus between stress and premenstrual syndrome, it is necessary to outline the demographic and behavioural antecedents of the study cohort. Adolescence is a developmental period in life, it is characterized by biological maturation, Affective volatility and significant academic pressure, which may buffer the effect of psychosocial stress on menstrual physiology.

Table 1. Demographic Characteristics of Respondents (n = 256)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	15	38	14.8
	16	104	40.6
	17	90	35.2
	18	24	9.4
Grade Level	X	88	34.4
	XI	88	34.4
	XII	80	31.3
Nutritional Status (BMI)	Underweight	32	12.5
	Normal	178	69.5
	Overweight	46	18.0
Physical Activity (times per week)	1 2 times	140	54.7
	3 4 times	89	34.8
	5 or more times	27	10.5
Average Sleep Duration (hours per night)	1 5 hours	61	23.8
	6 8 hours	154	60.2
	9 or more hours	41	16.0
Age at Menarche (years)	10 11 years	22	8.6

	12 13 years	135	52.7
	14 years or older	99	38.7

The respondents in terms of their demographics provide a good perspective of the psycho-social setting in which the study has been conducted. Most respondents were between the ages of 16 and 17 years which is a development stage often marked by cognitive growth, emotional impulsiveness and social sensitivity. This is the intermediate period of adolescence where identity exploration is coupled with academic and family requirements hence fertile grounds of stress build up. The lesser proportion of younger (15-year-olds) and older participants (18-year-olds) once again stresses the fact that the study is capturing a group in the very centre of the transitional phase of adolescence the age group during which the biological maturity and psycho-social sensitivity collide with each other most acutely.

The distribution of response grade levels (X, XI and XII) shows that the respondents had a fairly balanced academic exposure and responsibility. However, the fact that the differences between grades can be noticed implicitly means that there is also a certain level of educational pressure. Grade-X students are generally settling to the rhythm of senior high-school life; grade-XI students are facing the highest workloads with correspondingly higher grading; and grade-XII students are facing the ending of the academic demands associated with graduation and college admission. In these cyclical environments, stress is not a one time event but an orderly rhythm that is internal to the system of schooling itself.

Physiologically speaking, the data on the nutritional status offer a very essential basis on which the dynamics between physical health conditions, psychological and hormonal ones are identified. The fact that 69.5 percent of the participants are in the normal BMI range suggests that most of them can be analyzed in terms of stress and PMS using psychosomatic but not nutritional confounders. Nevertheless, a 12.5% under-weight and 18.0 percent overweight percentage make a pertinent detail because on both ends of body composition, the endocrine balance may be disrupted. Under nutrition can compromise estrogen synthesis, and excessive fat mass can increase estrogen storage, and their effects on menstrual regularity and symptom severity have opposite effects.

The physical activity data indicate a worrying pattern: over half (54.7 39) of the respondents were physically inactive, and only 10.5 39) of them exercised on a regular basis. This tendency of sedentary people indicates the larger lifestyle changes in the group of adolescents in the city educational environment, where active recreation is frequently replaced by digital activity and academic sedentism. Psychosomatically, lack of exercise is also associated with poor blood flow and lack of hormone progression as well as a reduced ability to release emotional strain-which is directly linked to perceived stress and PMS severity. On the other hand, exercise also plays a role of activating the release of endorphins and maintaining neuro-endocrine stability and serves as a natural mediator of stress physiology

The patterns of sleep duration are an additional interpretative layer. The fact that 23.8 of the respondents identified that they got less than 1-5 hours of sleep per night suggests that a large percentage of adolescents are chronically sleep deprived. The loss of sleep has been extensively recorded to raise the levels of cortisol and the inability of regulating mood, making such factors amplify reactions to stress, both psychological and physiological. At the same time, 60.2 per cent. kept an 68 hour range of sleep - a fairly balanced number, but which still merits interest, since teenage sleep, which is typically disrupted by emotions and technological stimuli, is qualitative. Students who slept 9 hours or above (16.0 -1 ) could indicate compensatory behaviour or less academic activity, and again, depicting that even sleep habits are socialised in the school system.

Lastly, menarche offers a physiological reference as a basis of hormonal maturity interpretation among respondents. The majority of the respondents (52.7 %) began their menstrual cycle at the age of 12-13 which is consistent with the global norms and proves that the sample is a biologically normative group. However, 38.70 per cent of the participants had menarche after 14 years and 8.60 per cent before 14 years, which means that developmental timing is heterogeneous and it could be affected by nutritional status, genetic orientation and exposure to psychosocial stress. Early menarche has been attributed to emotional hyperreactivity and susceptibility to stress, and late menarche may indicate an underlying nutritional or hormonal instability; both variables have a subtle influence on the premenstrual syndrome in adolescence.

Such demographic trends draw up a multidimensional portrait of adolescence as being both a biological and social phenomenon. The subjects of this research cannot be regarded as statistical subjects but, on the contrary, embodied subjects who are battling through overlapping systems of anticipation, academic, family, and cultural. They are not stressed out with nothing but a compounded result of the developmental shift, life limitations, and gendered embodiment. Through this prism, Table 1 becomes much more than a simple summary of the situation; it gets to be a contextual prelude to the realization of how banal adolescent habits, including studying time and sleep habits, are tightly bound with hormonal expression and reproductive health.

### Descriptive Analysis of Stress and PMS

These studies will further examine the level of perceived stress and premenstrual symptoms and the measurement scales that will be used are Perceived Stress Scale (PSS-10) and Shortened Premenstrual Assessment Form (SPAF).

Table 2. Descriptive Statistics of Stress and PMS Scores

Variable	Mean (M)	SD	Minimum	Maximum
Stress Score (PSS-10)	23.64	5.71	10	38
PMS Total (SPAF)	41.27	9.34	18	62
Physical Subscore	16.08	4.52	6	27
Emotional Subscore	14.73	3.88	5	24
Behavioral Subscore	10.46	3.27	3	17

The average stress level (M = 23.64) suggests that the respondents all tend to have an average-high level of stress. Similarly, the average PMS (M = 41.27) indicates the PMS symptoms are commonplace and that they are significantly manifested. It is important to note that the emotional aspect of PMS (M = 14.73) received the highest rate as compared to the behavioral symptoms, which depict that emotional reactivity i.e. irritability, sadness or anxiety is the most vivid element of menstrual discomfort in the subjects. This finding is consistent with the recent findings done by Nandakumar et al. (2023) and Dozsa-Juhasz et al. (2023) who found emotional strain as a key mechanism that relates stress and PMS in adolescent samples.

### Correlation between Stress and PMS

To determine the degree of association between stress and PMS, Pearson's correlation analysis was conducted on the total and subscale scores.

Table 3. Correlation between Stress and PMS Scores

Variables	r (Pearson)	Sig. (p)	Interpretation
Stress (PSS-10) ↔ PMS Total	0.693	0.000	Strong and significant
Stress ↔ Physical PMS	0.621	0.000	Strong
Stress ↔ Emotional PMS	0.702	0.000	Very strong
Stress ↔ Behavioral PMS	0.576	0.000	Moderate strong

Note: All correlations were significant at  $p = 0.001$  level (two-tailed).

The results of Table 3 indicate that there is a statistically significant positive correlation between perceived stress and the extent of PMS symptoms ( $r = 0.693$ ,  $p = 0.001$ ). The strongest association ( $r = 0.702$ ) is within the emotional subscale and the rest are the physical ( $r = 0.621$ ) and behavioral subscales ( $r = 0.576$ ). Such results indicate that emotional instability, which is indicated by irritability, sadness, or mood lability is the most delicate channel through which stress is expressed during the menstrual cycle.

Physiologically, the correlation is in line with the stimulation of the hypothalamic-pituitary-adrenal (HPA) axis that increases cortisol release and upset the gonadotropin-releasing hormone (GnRH) signalling, thus disturbing the estrogen/progesterone balance. The adolescent body is psychologically readable as an expressive sphere of psychic tension in which the repressed stress is taken over in somatic symptoms. These findings are in line with the psychosomatic model of PMS that assumes a combined interplay between emotional, physiological, and social factors in the adolescent stress response.

### Regression Analysis: Stress as a Predictor of PMS

To confirm whether stress independently predicts PMS after controlling for lifestyle and biological factors, binary logistic regression was applied.

Table 4. Binary Logistic Regression Analysis of Stress and PMS

Predictor Variable	B	SE	Wald	Sig. (p)	Exp(B) (AOR)	95% CI for AOR
Moderate Stress	3.41	0.72	22.53	0.000	30.20	4.10 223.50
Severe Stress	5.80	1.01	33.25	0.000	330.80	31.70 3410.40
Late Menarche (14 years or older)	0.46	0.28	2.73	0.098	1.59	0.91 2.78
Moderate High Physical Activity (3-7 times per week)	0.61	0.27	5.15	0.023	0.54	0.32 0.92
Sleep Duration (6-10 hours)	0.74	0.31	5.61	0.018	0.48	0.26 0.88

Model Summary: Nagelkerke  $R^2 = 0.52$  2 Log Likelihood = 188.67 Classification Accuracy = 84.8%

Logistic regression model will provide a multivariate in noting the role of stress as salient predictor of premenstrual syndrome (PMS) in adolescent females. The entire model demonstrates good explanatory power (Nagelkerke  $R^2 = 0.52$ ) that means that the portion of variance in PMS occurrence it explains is greater than 50 percent. This statistical sufficiency, which is also supported by a classification accuracy of 84.8%, is an indication of not only the accuracy of the empirical data, but also the internal consistency of the psychosomatic theoretical framework that the investigation was based on. It indicates that stress along with its concomitant behavioral correlates is an organized, non-random arrangement in the reality of the experience of the adolescent cohort.

The empirical evidence is used to present a strong dose-response interaction between the intensity of stress and the susceptibility of PMS. Young adults who reported moderate stress were identified to be 30.2 times more likely to have PMS as opposed to those who reported mild stress. The correlation was very significant among those individuals who were categorized as suffering severe stress and the odds ratio of such individuals was 330.8. This impressive scale emphasizes the fact that stress is more of a threshold effect than a linear one, whereby tension accumulation exceeds a biological threshold starting a biological reaction. On the

biological level, chronic activation of the hypothalamic-pituitary-adrenal (HPA) axis increases cortisol, which in turn disturbs the release of gonadotropin-releasing hormone (GnRH). This disruption in its turn disturbs the circadian rhythms of estrogen and progesterone discharge making the hormonal balance supporting normal menstrual cycling unstable. The resultant dynamic feedback process involves an amplified stress that increases hormonal dysregulation, which subsequently leads to emotional vulnerability.

However, the model does not limit the definition of PMS risk to stress. The variable of late menarche (14 years and above) was not significant ( $p=0.098$ ) but displayed a small positive increased probability of PMS (AOR= 1.59). This association does not provide sufficient grounds to make any causal inference, but it makes one think of how biological maturation and psychosocial context interact. A late age of menarche can indicate a heterogeneity of development that is possibly affected by nutritional condition, predisposition, or both cumulative environmental and affective stresses. In such a multifaceted environment age at menarche serves as a biological/social marker, as it represents how the body adapts to the environment.

Physical activity and sleep duration are also revealed by the model as an important protective factor that highlights the inherent ability of the organism to restore homeostasis when maintained through healthy habits. Respondents with moderate-to-vigorous physical activities (three to seven times per week) had an approximated 46 per cent reduction of developing PMS and those with sufficient sleep (six to ten hours daily) had a 52 per cent decrease in the risk. Such results support the buffering effect of restorative practices. Exercise counteracts stress hormones, enhances serotonin production, and relaxation of neuromuscular, which reduces affective and somatic symptoms of PMS. Sleep, as a method of resetting the HPA axis/reestablishing circularity of cortisol diurnal rhythm, strengthens emotional resilience. Therefore, the two lifestyle factors can be considered physiological and psychological controllers of the ecosystem of stress.

Interpreted in the larger framework of sociocultural context of adolescence, these findings take on a further level. Stress in Madrasah Aliyah Negeri Makassar City amongst students is not a lonely affective state but a socially constructed state that is fostered through an institutional ethos that prizes moral discipline, academic achievements and emotional control. In such frameworks, the adolescents absorb norms that might be above their adaptive levels. In the case of young women especially, pressures are further exacerbated with taboos in relation to menstruation and emotional dialogue making the body a channel through which unarticulated tension is released. PMS, in this environment, does not only become a physiological illness but it becomes a psychosomatic manifestation- a body language, which is used when the culturally approved emotion outlets are silenced. The unusually large odds ratios thus have both biological and existential implications as they represent the hidden role played by emotional regulation that adolescent girls are engaged in yet quietly.

The regression analysis highlights one core point: stress does not only consist of a cognitive appraisal, but a lived embodiment, which mediates emotional, behavioural, and endocrine systems, especially throughout the period of developmental window of adolescence. As a result, the given model fosters the paradigm shift in health intervention that is not associated with pharmacological or biologically oriented solutions. It supports organizing consistent physical exercise, sleep, and establishment of emotionally supportive learning conditions as key community health measures. Besides, it encourages educators and policymakers to recognize that mental and reproductive health are two aspects of teenage health that cannot function without each other. The statistical account made in Table 4 is therefore re-organized into a human narrative- a plea to acknowledge young women as not merely objects of biological transformation but as conscious agents who negotiate the invisible architecture of stress by having their own corporeal experience.

## Distribution of PMS by Stress Level

A clearer picture of this relationship emerges when PMS prevalence is examined across stress categories.

Table 5. Distribution of PMS by Stress Levels

Stress Level	PMS (+)	PMS (-)	Total	PMS Risk (%)
Mild	1	14	15	6.7
Moderate	114	53	167	68.3
Severe	71	3	74	95.9
Total	186	70	256	72.7

Chi-Square ( $\chi^2$ ) = 98.73, df = 2, p = 0.000

It is shown in Table 5 that the levels of stress are directly proportional to the premenstrual syndrome (PMS). Participants with mild stress exhibited PMS symptoms in only 6.7%; the proportion of participants with moderate stress exhibited PMS was 68.3, and those with severe stress exhibited PMS (95.9). The correlation was determined to be extremely significant through a chi-square test (p= 0.000).

The pattern observed suggests a dose-dependent development, which suggests that a rise in psychological stress level is associated with an increment in PMS prevalence. This linearity is consistent with a hypothesis of the sensitization of the hypothalamic-pituitary-adrenal (HPA) axis, in which chronic exposure to stress increases cortisol secretion and, as a result, disrupts endocrine balance.

The relationship is based on more than just biological issues culturally. Chronic stress becomes normalized in a religious school environment where discipline is highly valued in a moral way, success in academics and emotional control. The almost universal use of PMS by students under the most extreme pressure underlines the role of female adolescent body as a site of expression of emotional experiences otherwise neglected by the social environment.

## Instrument Reliability and Validity

Table 6. Reliability and Validity of Measurement Instruments

Instrument	No. of Items	Cronbach's Alpha	r-value Range	Status
PSS-10 (Perceived Stress Scale)	10	0.86	0.47-0.78	Reliable
SPAF (Shortened Premenstrual Assessment Form)	10	0.91	0.51-0.82	Reliable

Table 6 validates that both instruments used are psychometrically sound. Getting a Cronbach alpha coefficient of 0.86, the Perceived Stress Scale (PSS-10) had compared to 0.81, which is considered to be the highest reliability level, and 0.91, which is the highest reliability value, obtained by the Shortened Premenstrual Assessment Form (SPAF). These indices reveal that all the instruments were always used to measure the constructs that they were supposed to in the target adolescent population.

The range of item-total correlation (0.47-0.82) also confirms the fact that each of the items plays a significant role in a construct validity. This conclusion builds on the assurance that the relationships between stress and premenstrual syndrome are real psychosomatic patterns, and not the effects of measurement error. It also highlights that both scales can still be seen as reliable and culturally flexible in the Indonesian educational settings, thus offering a major methodological guarantee of the localized psychosocial studies.

## Comparative Analysis with Previous Studies

To position the current findings within broader scholarly discourse, Table 7 compares them with recent global studies on stress and PMS

Table 7. Comparative Findings from Recent Studies

Author & Year	Location	Sample	Method	Key Findings	Relevance to This Study
Dózsa-Juhász et al. (2023)	Hungary	350	Cross-sectional	Stress increased PMS; exercise moderated symptoms	Reinforces physiological mediation
Nandakumar et al. (2023)	India	400	Survey	Academic stress predicted PMS severity	Aligns with school-based adolescent stress
Alshdaifat et al. (2022)	Jordan	280	Survey	70.1% reported PMS; stress primary determinant	Parallels Indonesian prevalence
Mbiydzennyuy et al. (2024)	Global Review		Systematic Review	Chronic stress alters GnRH and hormone balance	Provides biological mechanism

Table 7 puts the current empirical results into the greater context of the global discourse on adolescent psychosomatic health. In a variety of geographic environments, the presence of stress has always been a universal predecessor of PMS. These studies coincide with the existing data, which support the external validity of the results.

Indicatively, Dozsa-Juhasz et al. (2023) established that physical exercise had a moderate effect on establishing the relationship between stress and PMS, and the protective effect of physical activity observed in the study was also reflected in this research. Nandakumar et al. (2023) pointed to academic stress as an influential factor among Indian students, which is a socio-educational factor that is reflected in the Islamic education of Makassar. In line with this, similar psychosomatic vulnerability was found by Alshdaifat et al. (2022) who observed that more than 70 percent of Jordanian medical students have experienced PMS, highlighting the rising levels of psychosomatic vulnerability across cultures. The authors suggested a physiological process, which explains these findings, and linked neuroendocrine disproportion through the HPA axis to chronic stress exposure (Mbiydzennyuy et al., 2024). These researches affirm that the stress-PMS relationship is cultural transcendence but differs among the educational, emotional, and gendered expectations. The results of the Indonesian investigation contribute to this discussion with the addition of religious and moral contextuality when the psychosomatic translation of stress is enhanced through emotional suppression and adherence to social norms.

The findings of this document shed light on a very human fact: stress is not an experience of the mind only but a physiological language with which the body reflects what the mind goes through. The strong correlation between stress level and prevalence of premenstrual syndrome (PMS) among adolescent girls in MAN1 Makassar City is not only a numerical relationship, but also a manifestation of the interplay of emotion, biology and social expectation in the lives of young women. To make any meaning out of such a relationship, it is essential to pull out of statistical abstraction into the corporeal conditions of adolescence where hormonal cycles, emotional upheavals and school demands converge in a highly personalized manner.

Scholarship has shown a tendency to re-examine the psychosomatic aspects of PMS, in recent years, recognizing the future that the cyclical discompositions of the body are frequently aggravated under stress and emotional pressure. An example is the study conducted by Dozsa -Juhász et al. (2023) in the extensive cross-sectional study of Hungarian women, who showed a direct relationship between the higher perceived stress levels and the severity of the PMS symptoms. What makes their work interesting is that not only the correlation was found, but also, the framing of stress as an ecosystem experience, which is moderated by behavioral and lifestyle factors including physical activity. Females who exercised often experienced reduced stress and the symptoms of PMS which were milder in nature, which indicated that physiological resilience and psychological balance were mutually reinforcing. This observation is close to our adolescent audience: where there is no opportunity to relieve the emotions and the body in physical form, the consequences of stress accumulate silently but with power, which will manifest themselves subsequently in somatic pain or hormonal imbalance.

A comparable story is brought forward in Nandakumar et al. (2023), who looked at students studying at a university in India and found that stress is a significant predictor of PMS. Their results also preempt a reality that some of our participants are privy to: students who had to juggle heavy academic timetables, tests, and family pressures were more likely to encounter stress which aligned with an increased rate of PMS symptoms. The most striking thing about the work of Nandakumar is that it is highly contextual, or more to the point, it is about the recognition of the fact that stress among students is not just a personal state but a cultural one (Nguyen et al., 2025; Devantier et al., 2025; Nelekar et al., 2022). It flourishes in educational systems where performance is equated with value and the young women are taught to absorb the external pressures until they become physical. In this, the results of our Indonesian study reflect a wider regional trend: PMS in adolescents cannot be discussed outside of the sociocultural and institutional atmosphere that influences their emotional life on a daily basis.

Such a correlation between stress and PMS has been reported in the Middle East too. Alshdaifat et al. (2022), who studied the population of medical students in Jordan, found the prevalence of PMS to be above 70 per cent, and perceived stress turned out to be a critical factor. However, not even among students who were educated in medical sciences, the best informed students in stress management awareness did not translate to less stress and fewer symptoms. Their work highlights one critical paradox, knowledge is incomplete in the absence of emotional literacy. This observation enriches our results in an Indonesian school setting in which the understanding of menstruation and stress can be at a superficial level, however, in general, is not accompanied by a supportive environment to develop self-regulation or psychological stability. Those similarities in cultural and cross-disciplinary settings point to the fact that the stress-PMS relationship is not limited to geography; it is an appeal to a common set of feelings of contemporary adolescence one in which the cognitive overload, social comparison, and silent pressure of becoming play a role (Uktamovna, 2025; Pellegrino, 2024; Fajar et al., 2021).

Similar to the psychosocial patterns, their physiological basis has been improved by the development of neuroendocrine studies. Mbiydzennyuy et al. (2024) provided an exceptionally powerful synthesis regarding the relationship between the hypothalamic-pituitary-adrenal (HPA) axis and reproductive hormones. Their analysis showed the effect of chronic stress in increasing cortisol secretion that subsequently hinders gonadotropin releasing hormone (GnRH) and disturbs the regulation of estrogen and progesterone. These hormonal changes form the very backdrop of PMS, which accounted why women who are subjected to chronic psychological stress were more likely to develop severe physical and emotional symptoms. On the same note, Hantsoo et al. (2023) talked about the involvement of serotonin and GABA dysregulation during periods of stress and attributed emotional lability and irritability in PMS to neurochemical disequilibrium. These biological causes make the sudden steepness of our study statistics believable: the biochemistry of the body reacts to the continued stress not

passively but dynamically, making the inner discomfort manifested in menstrual symptoms which indicate not only physical but also emotional discomfort.

However, hormones are not enough to complete the relationship between stress and PMS. This relationship also has an emotional and cultural grammar. The negotiation between the body, mind and society is becoming highly visible especially in adolescence especially among girls. A 2024 study of adolescent stress responses to the COVID-19 pandemic in Germany revealed that female adolescents were more prone to stress reactivity and emotional dysregulation than males and that it was influenced by gendered expectations and social rules (Holl et al., 2024; Bernhard et al., 2025; Paschke et al., 2021). Even though their research was set in a different environment, the knowledge is translated in our society, with the female adolescent body taking in the weight of expectations to work, to act correctly, to fit unobtrusively. In cases of lack of social support and emotional articulation, the menstrual cycle is a space of embodiment when those pressures are expelled. In this way, it is possible to interpret PMS as a biomedical condition and a socio-emotional reaction to the surroundings in which one must be composed and leave few space to be vulnerable.

This extended definition can also be further encouraged by the behavioral studies that examine moderating factors that may mitigate severity of PMS. As an example, systematic reviews conducted by 2023–2024 have re-established that regular exercises, good sleep and mindfulness-based interventions can go a long way in alleviating PMS symptoms. Specifically, aerobic exercise was proved to maintain cortisol rhythms and enhance serotonin balance, which is how the finding that aligns well with Dozsa et al. (2023) emphasis on the mediating power of exercising. These articles imply that stress and PMS are not to be considered as separate pathologies, but a part of a greater psychosomatic continuum that is sensitive to environmental, behavioral, and emotional treatment. Such a view provides avenues where schools and health programmes can become transformative spaces: not necessarily providing academic education but developing physical and emotional strength by offering wellness programmes to follow.

Our findings are, thus, not only epidemiologically valid. It requires a consideration of the structure of the adolescence itself, a period when both the set of fears in the mind and the processes in the body are yet to be acquainted with one another. It is very common that both stress and PMS are on the high side of our respondents, and that is a generation that is improvising their moves without sufficient emotional scaffolding. In this regard, schools are not only learning institutions but stress systems, and they tend to inadvertently contribute to the pressure on the system of competitive assessment and social ranks. Having realised this, it is agreeable that the solution to the PMS problem lies in ensuring that the conditions that lead to stress are addressed first (Rumon et al., 2025; George et al., 2024). These educational environments need to change so they can support psychological safety: through curricular support of menstrual health, through facilitating emotional expression, and through normalizing discussions on female embodiment as an integral aspect of holistic well-being.

However, this study does not go without methodological limits. As with most cross-sectional designs, the directionality of stress and PMS is open to discussion; however, the association but not the causality is observed. This makes it plausible that severe PMS is a worsening cause of perceived stress, a cause and effect relationship where one reinforces the other. Furthermore, the smaller sample of low stress subjects might have increased confidence intervals implying that there is need to be cautious in the interpretation of the extremity of odds ratios. The research strategy in the future must be one based on longitudinal and mixed methods and is based on the combination of daily symptom diaries, hormonal tests, and qualitative stories to not only examine how stress leads to PMS but how young women interpret this experience in their cultural worlds.

Finally, the current research is a part of a growing discourse on the topic of adolescent health that crosses disciplinary lines. It complies with the fact that the modern experts in the field of psychology, medicine, and education tend to believe that emotional control and physical health are the concepts that cannot be separated, and that teenage well-being will never be attained without taking into consideration the daily fabric of stress penetrating the educational settings. We are not isolated in our findings as Hungary to India, Jordan to Indonesia, and many others are singing the same song that stress is the silent stream that forms menstrual and emotional health. What is unique to our work, however, is that it is resonant locally: it hears the voices of the young Indonesian women whose voices are usually relegated to the periphery in the international statistics, but whose voices are extremely educative.

## Conclusion

This paper shows that there is a strong correlation between stress and premenstrual syndrome (PMS) in adolescent girls in Madrasah Aliyah Negeri 1 Makassar City. The statistics show that stress levels are higher in people who have higher levels of PMS symptoms and the severity of the symptoms, which implies that there is a psychophysiological connection to emotional strain, which produces its manifestations in the body. Such an association is not simply biological but rather the realities of being an adolescent: a time of academic expectations, social pressures and hormone changes thus making stress an almost constant companion. In this respect, PMS is not only a medical symptom, but a kind of embodied communication which helps to demonstrate the psychology and social pressures young women bear in silence.

These findings can be viewed in connection with recent studies, such as works by Dozsa-Juhasz et al. (2023), Nandakumar et al. (2023), and Hantsoo et al. (2023), to affirm that PMS cannot be perceived outside of the context of the emotional ecosystems that support it. Perpetuated stress interferes with endocrine balance, changes serotonergic systems, and weakens emotional stability, which is shown by modern neuroendocrine studies. The phenomenon is, however, not entirely due to biology. The problem of performance and discipline which are valued over rest and reflection in the cultural and institutional context of schooling creates a culture of normalized stress. In these environments, what the mind is unable to express gets transferred to the body and menstrual pain is a silent protest against the unsanctioned tension.

These lessons confront us to redefine adolescent health as a combined field where emotions, corporeality, and environment coexist. The correlation between PMS and stress highlights the indisputable unity of psychological wellness and reproductive health. Thus, schools should be regarded not as just educational centers but as emotion habitats, the atmosphere of which influences the physical conditions of students. The programs focused on stress management, mindfulness, physical exercises, and menstrual literacy must thus take a central role in health education but not a peripheral role. By relieving emotional loads in a learning setting, teachers and policy-makers will be able to reduce the prevalence of PMS and enhance resilience and compassion in students.

Finally, this research does not only provide some empirical evidence but also insights. It shows that the adolescent body serves as a biological system and narrative production that documents the environmental pressures and reacts to them. The lowering of PMS is hence not just a medical goal but a social and educational responsibility that aims to establish schools and communities in which emotional health is seen as part and parcel of learning and in which young women are able to live within their developinodies without the constant process of stressing pain. Once these environments are achieved it is possible that the patterns found here will start to change, the cycles of discomfort will turn into the cycle of balance, awareness, and care.

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