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Influence of Stress Level on Dysmenorrhea Severity among Female University Students

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ABSTRACT

Objective: Dysmenorrhea, or painful menstruation, is a common issue among young women, particularly university students, and has a significant impact on their daily functioning. This study aimed to investigate the relationship between stress levels and the severity of dysmenorrhea among female university students.

Methods and Materials: A correlational study was conducted involving 367 female students from the University of Karbala, aged 18 to 25 years, selected through convenience sampling. Stress levels were assessed using the Perceived Stress Scale (PSS-10), while the severity of dysmenorrhea was measured using the WaLIDD scale. Demographic data were also collected. The data were analyzed using descriptive statistics, Pearson's correlation, and simple linear regression.

Findings: The majority of participants (89.6%) reported moderate stress levels (mean score: 21.09 ± 4.023), while the severity of dysmenorrhea was 8.34 ± 1.381 (mean score: 8.34 ± 1.381). Regression analysis revealed a significant positive relationship between stress levels and dysmenorrhea severity ($\beta = 0.224$; $p = 0.009$). For each unit increase in stress levels, a 0.0753 unit increase in dysmenorrhea severity was predicted.

Conclusion: The study emphasizes that higher stress levels worsen dysmenorrhea, highlighting the importance of psychological factors in menstrual health. Stress management interventions, such as counseling and relaxation techniques, can help reduce the impact of dysmenorrhea. Universities should implement programs to support students' well-being, including education on menstrual health, self-care, physical activity, and access to healthcare services, including gynecological and psychological support.

Keywords: Dysmenorrhea, Stress Level, Psychological Health, Students.

Introduction

Menstruation is an essential physiological process and a widespread indicator of a woman's endocrine and reproductive fitness. Among the various factors influencing dysmenorrhea, behavioral and mental traits play a critical role (Ali et al., 2022; Ali & Al-Juboori, 2021). Dysmenorrhea, usually called painful menstruation, has an extensive, terrible effect on adolescent women, mainly during their developmental level (Taş & Zincir, 2021). It is one of the most common universal gynecological issues, affecting up to 90% of girls of reproductive age (Sima et al., 2022). There are two classifications of dysmenorrhea: primary and secondary (Wang et al., 2022). Primary dysmenorrhea is characterized by menstrual pain in the absence of any underlying pelvic pathology, mainly attributable to increased endometrial prostaglandin synthesis (Vlachou et al., 2019). In evaluation, secondary dysmenorrhea is associated with identifiable gynecological conditions, such as endometriosis or pelvic inflammatory disease (Elsayed Elaraby et al., 2025; Vlachou et al., 2019). Despite its high occurrence, dysmenorrhea is regularly underdiagnosed and undertreated because of societal stigmas and the normalization of menstrual pain (Chyad & Faris).

Dysmenorrhea is the most commonly pronounced gynecological issue amongst female college students, drastically affecting their daily activities and educational performance (Mesele et al., 2022). Several threat factors have been diagnosed, which include smoking, anxiety, premenstrual syndrome, early menarche, age beneath 20, and a family history of dysmenorrhea (Azagew et al., 2020; Derseh et al., 2017; Orhan et al., 2018). In the context of university college students, information about these contributing elements is important for developing effective preventive and management strategies tailored to individual preferences (Yurdakos et al., 2013).

Stress, a common occurrence amongst university college students, has been identified as a key factor that exacerbates the severity of dysmenorrhea. Female college students face various academic, social, and personal challenges that can negatively impact their mental and physical well-being. Existing research highlights a bidirectional relationship between pressure and dysmenorrhea, where improved stress levels are related to heightened menstrual pain (Ali & Al-Juboori, 2021; Appleyard et al., 2020). It has been counseled that strain-induced dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis may also contribute to increased prostaglandin synthesis, thereby intensifying dysmenorrhea signs (Bajalan et al., 2019). A meta-evaluation further confirmed that psychological strain is a good-sized predictor of menstrual ache severity, emphasizing the importance of stress-reduction strategies for individuals experiencing dysmenorrhea (Jaleel & Nawam, 2022). Additionally, lifestyle factors related to strain, including poor sleep quality, poor nutritional habits, and decreased physical activity, were associated with worsened menstrual pain (Situmorang & Anastasya, 2024; Yurdakos et al., 2013). These findings spotlight the need for an integrated approach to dysmenorrhea management, addressing both physiological and psychosocial elements.

The impact of pressure on menstrual health is particularly evident among female college students, who regularly face high academic pressures. Research has shown that heightened pressure levels not only aggravate dysmenorrhea severity but also contribute to increased absenteeism and reduced academic performance (González-Echevarría et al., 2019). Furthermore, a strong correlation has been observed between menstrual pain and pressure-associated coping mechanisms, suggesting that coaching in strain-discount strategies, including mindfulness and relaxation techniques, may also help alleviate dysmenorrhea symptoms in this population (Azeyadi & Ali, 2024; Deep & Oleiwi, 2024; Teherán et al., 2018). Despite those insights, in addition, studies are needed to explore the complex relationship between stress and dysmenorrhea severity, mainly amongst female college students. Many previous studies were limited by small sample sizes, cross-sectional methodologies, and a lack of consideration for cultural and environmental elements that can affect this affiliation. Therefore, destiny studies need to propose to offer a more complete understanding of this relationship, ultimately informing effective interventions to enhance menstrual fitness and overall well-being in female college students.

Methods and Materials

Study Design and Participants

The impact of stress levels on the severity of dysmenorrhea in college students was evaluated in this study using a correlational methodology. At the University of Karbala, this design was selected to estimate the association frequency between the two variables at a given point in time.

Study sample

The study was conducted at the University of Karbala, located in Karbala, Iraq. The target population consisted of female students enrolled at the university. The sample comprised 367 female students selected through convenience sampling. The inclusion criteria were female students aged 18 to 25 years who suffered from menstrual pain. In contrast, the exclusion criteria were female students who suffered from known underlying medical conditions that may affect menstruation or pain perception.

Study tools

Data were gathered using two validated instruments: the Women's Lifestyle and Dysmenorrhea Assessment (WaLIDD) scale, a validated tool for measuring the severity of dysmenorrhea and choosing items that contribute to its severity (Teherán et al., 2018), and the Perceived Stress Scale (PSS10) for measuring stress levels (Siqueira Reis et al., 2010).

To gather information on age, BMI, marital status, academic stage, current residence, and mothers' education, a demographic questionnaire was also distributed. To ensure clarity and reliability for the intended audience, the instruments were pre-tested with a small sample.

Data collection

Participants self-administered questionnaires to gather data. The questionnaire was given to students to fill out at designated campus locations or during scheduled university lectures. Written consent was obtained, and participants were informed of the study's goal before the questionnaires were distributed. Statistical analysis: Data were analyzed using SPSS software version 26. Descriptive statistics, such as means, frequencies, and percentages, were used to summarize demographic characteristics, stress levels, and dysmenorrhea severity. The relationship between stress levels and dysmenorrhea severity was assessed using Pearson's correlation coefficient and simple linear regression analysis. The significance level was set at $p < 0.05$ for all statistical tests.

Findings and Results

Table 1 summarizes the socio-demographic variables (SDVs) of the study sample. The majority of participants (80.4%) are aged 20 years or older, with a mean age of 20.85 years (±1.379). Most participants (62.7%) have a normal BMI, while 25.9% are overweight, and 5.7% fall into either the underweight or obese categories. Nearly all participants (99.7%) are single, with the largest proportion in the 3rd academic stage (34.1%). The majority live with their families (93.5%) and in rural areas (73.8%). Regarding mothers' education, the most common levels are primary school graduates (24.0%) and intermediate graduates (22.1%), while university graduates and illiteracy are less common (11.7% and 4.4%, respectively).

Table 1

Distribution of Study Sample by their Socio-demographic Variables (SDVs)

SDVs	Classification	No.	%
Age	<20	72	19.6
***M ± SD*= 20.85±1.379**	≥20	295	80.4
BMI	Underweight (<18.5)	21	5.7
***M ± SD*= 24.80±12.654**	Normal (18.5- 24.9)	230	62.7
	Overweight (25.0- 29.9)	95	25.9
	Obesity (30.0 and above)	21	5.7
Marital status	Single	366	99.7
	Divorced	1	.3
Academic stage	1st	91	24.8
	2nd	72	19.6
	3rd	125	34.1
	4th	76	20.7
	5th	3	.8
Current residents	With family	343	93.5
	Internal department	24	6.5
Residents	Rural	271	73.8
	Urban	96	26.2
Mothers Education	Illiterate	16	4.4
	Read and write	75	20.4
	Primary school graduate	88	24.0
	Intermediate graduate	81	22.1
	Preparatory school graduate	46	12.5
	Institute graduate	18	4.9
	University graduate	43	11.7

No. Number; %= Percentage; M= Mean; SD= standard deviation

Table 2

Evaluation of Stress Level and Dysmenorrhea Severity among Female University Students

Variables	Score	No.	%	M± SD
Stress Level	Low (0-13)	7	1.9	21.09±4.023
	Moderate (14-26)	329	89.6	
	High (27-40)	31	8.4	
Dysmenorrhea Severity (WaLIDD scale)	Mild (1-4)	2	.5	8.34±1.381
	Moderate (5-7)	83	22.6	
	Sever (8-12)	282	8.34±1.381	

M: Mean for total score, SD: Standard Deviation for total score

The results of the study showed that 89.6% of university female students expressed a moderate level of stress at an average score (21.09±4.023). Regarding dysmenorrhea severity, 76.8% of university female students showed severe dysmenorrhea and an average score of 8.34±1.381 (Table 2).

Table 3

Influence of Stress Level on Dysmenorrhea Severity among Female University Students

Variables	Unstandardized Coefficients		Standardized Coefficients	T	*Sig.*
	B	Std. Error	Beta		
Stress Level *vs.* Dysmenorrhea Severity	.075	.020	.224	3.748	.000

Dependent Variable: Dysmenorrhea Severity

The results of the simple linear regression in Table 3 indicate that stress level and the severity of dysmenorrhea are statistically significantly associated among female university students (β = 0.224; p = .009). Specifically, for every unit increase in stress levels (+6.7869), the severity of dysmenorrhea is predicted to increase by 0.0753 units (R^2= 0.0503) (Figure 1).

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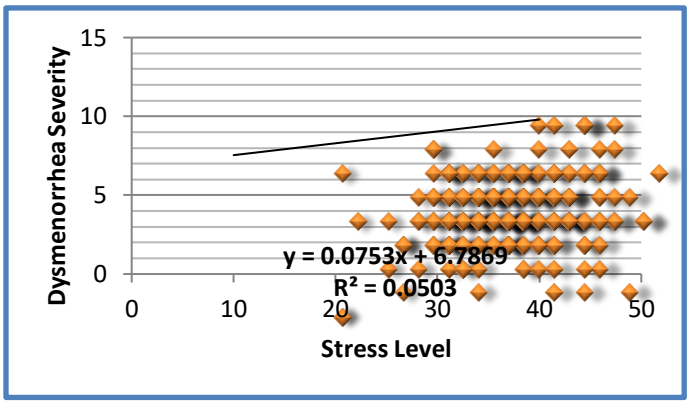

Fig. 1

Influence of Stress Level on Dysmenorrhea Severity

Discussion and Conclusion

According to the current study's findings, the majority of female college students report mild stress.

These results align with the general understanding that stress is a prevalent issue among college students, often linked to social difficulties, academic demands, and the transition to adulthood. According to earlier research, such stress levels may have an instantaneous effect on physiological health, including the intensity of dysmenorrhea. Our findings are lower than those reported in Saudi Arabia and South Korea, and lower than comparable research conducted in other nations (Al-Qahtani & Alsubaie, 2020; Shaw et al., 2017). where a related study found that nearly all female students were under much stress, numerous cultural, educational, and social factors, including competitive educational systems, disparate social pressures, or the scarcity of mental health support services in South Korea, could be to blame for this disparity. Higher levels of stress were also reported in the Saudi Arabian study, which may be linked to specific financial or environmental circumstances that Saudi Arabian university students face. On the other hand, our impact is greater than that of North Lindsey College in Scunthorpe, UK (Yasir et al., 2018). University students in the UK had a much lower average stress score, suggesting they have access to better stress-reduction apps or a less disruptive learning environment.

The study's findings showed that, with a mean severity rating of 8.34±1.381, almost all female university students (76.8%) experience severe dysmenorrhea.

These consequences highlight the significant impact dysmenorrhea has on young women's lives, particularly for female college students who frequently deal with stress related to their studies, changes in their lifestyles, and adjustments in their health-related habits. In this population, severe dysmenorrhea may be linked to worse quality of life, absenteeism from school, and lower academic achievement. Compared to studies of female Palestinian university students, where the prevalence of severe dysmenorrhea was found to be lower, our study's results are significantly higher (Armour et al., 2019). This disparity could be explained by variations in these regions' access to health care services, dietary habits, levels of physical care, or cultural norms. Students at the University of Western Sydney in Australia, for instance, might be more aware of and use pain management strategies, or engage in more frequent physical activity, which has been shown to reduce dysmenorrhea symptoms (Ali et al., 2022; Situmorang & Anastasya, 2024).

The study's findings indicate a statistically significant correlation between female university students' stress levels and the severity of their dysmenorrhea. This implies that a significant factor in the exacerbation of dysmenorrhea symptoms is stress. The findings highlight the importance of psychological factors in the onset of menstrual pain by showing that the severity of dysmenorrhea is predicted to increase by 0.0753 units for every unit increase in stress levels. These results are in line with earlier research linking menstrual fitness to stress. High levels of perceived stress, for instance, have been linked to an increased risk and severity of dysmenorrhea, according to a study by Klusmann et al. (2023). Mental stress increases sensitivity to pain by altering the hypothalamic-pituitary-adrenal (HPA) axis, which in turn exacerbates the perception of menstrual pain. The results of recent studies that emphasize stress as a modifiable risk factor in the treatment of dysmenorrhea are supported by these studies. Consistent with earlier research, this study demonstrates the significant influence of stress on dysmenorrhea intensity, thereby establishing a foundation for targeted interventions.

The study highlights that higher stress levels contribute to increased dysmenorrhea severity,

emphasizing the role of psychological factors in menstrual health. Addressing stress through targeted interventions may help reduce the impact of dysmenorrhea on students' daily lives. Universities should implement stress management programs, including counseling and relaxation techniques, to support students' well-being. Educational initiatives on menstrual health and self-care strategies can help students better manage dysmenorrhea. Promoting physical activity and ensuring access to healthcare services, including gynecological and psychological support, are essential.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. Ethical considerations in this study included the fact that participation was entirely optional.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contribute to this study.

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