

Association of dysmenorrhea with stress among female students at Universal College of Medical Sciences, Bhairahawa

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ABSTRACT

Background: Dysmenorrhea, the cramping pain experienced by women during menstruation, can significantly impact their daily lives and academic performance. Mental stress is a potential trigger for dysmenorrhea, but their association remains to be precisely determined. This study aims to explore the prevalence of dysmenorrhea among undergraduate female students at Universal College of Medical Sciences and investigate its association with perceived stress.

Methods: A descriptive cross-sectional study was conducted among undergraduate female students at Universal College of Medical Sciences, Bhairahawa. Participants were selected using a simple random sampling method. A structured questionnaire, including anthropometric data, menstrual history, and the Perceived Stress Scale (PSS), were used for data collection. PSS scores were used to categorize stress levels as low, moderate, or high.

Results: Total 196 female students participated in the study. Dysmenorrhea was present in 80.1% of the participants, with 34.7% seeking treatment for the condition. Additionally, 29.6% of the students reported moderate to severe premenstrual symptoms. Most students (81.6%) had a moderate level of perceived stress. Statistical analysis revealed a significant association between dysmenorrhea and level of perceived stress ($p < 0.001$).

Conclusion: The study findings highlight a considerable prevalence of dysmenorrhea among female students at Universal College. The association between dysmenorrhea and perceived stress underscores the importance of addressing the psychosocial well-being of these students. Implementing supportive measures, such as mental health support and stress management programs, can create a more conducive environment for students to manage dysmenorrhea and its impact on their academic performance.

Keywords: academic performance, dysmenorrhea, female students, perceived stress

INTRODUCTION

Menstruation is a physiological phenomenon with not only biophysical changes but also psychosocial elements along with it which all have reverberations for a woman [1]. Dysmenorrhea is the cramping pain felt around the lower abdominal area starting right before or during menstruation cycle and subsiding after a few days. Symptoms like nausea, vomiting headache, lightheadedness, and diarrhea, leg pain, are associated with this annoying pain [2]. Dysmenorrhea, the most common gynecological problem is the cause of absenteeism in class in the female students every month. Numerous studies have found the prevalence of dysmenorrhea to be higher than 50% and the symptoms is perceived differently by different individuals [3,4,5].

Stress leads to impaired follicular development due to inhibition of the pulsatile release of follicle stimulating hormone (FSH) and luteinizing hormone

(LH) that could ultimately reduce progesterone synthesis and release. Prostaglandin, the mediator of pain and a potent vasoconstrictor is increased when progesterone is reduced. Prostaglandin leads to ischemic myometrium and intensifies the pain, resulting in dysmenorrhea [4].

It is a known fact that students in medical college go through high stress level more so evident in female students due to the various physical and psychosocial changes they undergo every month. Increased stress results in high cortisol that has wide range of side effects and in turn also increases luteinizing hormone (LH) which can disrupt the regular menstrual cycle [1]. Mental stress is a potent trigger of primary dysmenorrhea; though the association of the stress level with severity of the pain is yet to be elucidated [5].

Dysmenorrhea is often not taken into big consideration but knowing the modifiable risk factors of this condition is important as it hampers daily routine of a large group of

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women of reproductive age. Dysmenorrhea escalates the stress of a student and traps them into this vicious cycle of dysmenorrhea and stress further disrupting the quality life [6, 7].

The objective of this study is to determine the prevalence of dysmenorrhea in undergraduate health science students of Universal College of Medical Sciences and to explore its association with their perceived stress.

METHODS

A descriptive cross-sectional study was carried out among undergraduate healthy medical students. The data were collected after the approval of the Institutional Review Committee of Universal College of Medical Sciences (ref: UCMS/IRC/135/22). Written consent was taken from each participant after explaining about the procedure, promising confidentiality of their information. First and Second year students present in UCMS from December 2022 to February 2023 were the sample population for this study. The minimum sample size was estimated using the following formula: $n = Z^2 \times p \times q / e^2 = (1.96)^2 \times 0.5 \times (1-0.5) / (0.07)^2 = 196$; where, $Z = 1.96$ for 95% confidence level, $p =$ prevalence (taken as 50%), $q = 1-p$, $e =$ margin of error (taken as 7%). The sample was then selected by a simple random sampling method (lottery method). The students were explained about the objective of the study and a written consent was obtained. The students with ongoing medical illness, primary amenorrhea and history of pelvic pathology were excluded from the study.

A questionnaire containing anthropometric data and menstrual history along with the perceived stress scale (PSS) was provided to participating students. Body Mass Index (BMI) was classified as per the WHO Asian classification [8]. PSS was calculated for each subject. The PSS is widely used psychology assessing tool for measuring the perception of stress. Ten questions in the PSS objectively measured subjects' feelings and thoughts during the last month, each scored from Likert scale ranging from 0 (Never) to 4 (Very Often). PSS scores were obtained by reversing the responses to the four positively stated questions (3, 5, 7, & 8) and then adding up scores of all questions. Scores ranging from 0-13 was considered as low stress, 14-26 as moderate stress and 27-40 as high perceived stress [9].

Statistical analysis was performed by SPSS version 23 and the results were expressed as percentage and mean \pm standard deviation (SD). Analytical statistics were applied for association between parameters. A p-value of less than 0.05 was taken as statistically significant.

RESULTS

Total 196 females included in the study were medical, dental, nursing and paramedical students enrolled at UCMS in the 3 month period of 2022-2023. They were between the ages of 19 and 27 (mean age 22.08 ± 1.95) years. Table 1 shows the general characteristics of participants. Most of the students (137, 69.54%) had

normal body mass index, 24 were underweight, 28 were overweight while only 7 were pre-obese; none were obese as per the WHO Asian classification [10]. The mean age at menarche was 12.6 ± 1.1 years. One subject had polycystic ovarian syndrome and another one had hypothyroidism as per self-reported medical history.

Among the students, 22 (11.2%) had irregular menstruation over the last 6 months. The duration of menstruation was normal (3 to 7 days) in 168 students. Dysmenorrhea was present in 80.1% of the students, of which 34.7% received some form of treatment such as the use of hot water bag or analgesics, and 34.2% were regularly absent in classes. About one third (29.6%) expressed to have moderate to severe form of premenstrual symptoms.

The mean PSS score was 20.96 ± 4.98 . Majority of the students (81.6%) had moderate level of stress. Comparison of dysmenorrhea with stress category showed that

Parameters	Characteristics	Frequency	Percent
Body Mass Index	Underweight	24	12.24%
	normal	137	69.90%
	overweight	28	14.29%
	pre-obese	7	3.57%
Menstrual Cycle (over last 6 months)	Regular cycles	174	88.78%
	Oligomenorrhea	14	7.14%
	Polymenorrhea	8	4.08%
Menstrual Duration (Days of menstruation)	Normal (3 – 7)	168	85.71%
	Oligomenorrhea <3	25	12.76%
	Polymenorrhea >7	3	1.53%
Dysmenorrhea	Absent	39	19.9%
	Present	157	80.1%
Treatment for Dysmenorrhea (n=157)	Required	68	34.69%
	Not required	128	65.31%
Absenteeism due to Dysmenorrhea	None	106	54.08%
	Sometimes	23	11.73%
	Regularly	67	34.18%
Premenstrual Symptoms	None	31	15.82%
	Mild	107	54.59%
	Moderate	47	23.98%
	Severe	11	5.61%
Stress Level (PSS score)	Low	10	5.10%
	Moderate	160	81.63%
	High	26	13.27%

Characteristics	Stress Category			Chi Square	p value
	Low	Moderate	High		
No dysmenorrhea	7 (17.95%)	32 (82.05%)	0 (0%)	22.21 [#]	<0.001*
Dysmenorrhea	3 (1.9%)	128 (81.5%)	26 (16.6%)		

* Significant at 95% CI; # Fisher exact test.

Table 3: Correlation of total stress score with other parameters

Variables	Spearman rho	P value
Age	-0.129	0.071
Body Mass Index	0.07	0.332
Age at menarche	0.185	0.009*
Premenstrual symptom severity	0.254	<0.001*
* Significant correlations		

presence of dysmenorrhea is significantly associated with high level of stress ($p < 0.001$, table 2). Table 3 shows the correlation of stress score with other parameters. The score had weak positive correlation with age at menarche and with the severity of PMS but is not related to their age and BMI.

Besides, the score was also significantly higher in students with dysmenorrhea (Mann-Whitney $U = 2154.5$, $p < 0.001$) and with irregular cycle (Mann-Whitney $U = 1346$, $p = 0.001$) than without them; but it was not related to the duration of menstruation ($p = 0.625$).

DISCUSSION

Menstruation is still a little-discussed gynaecological issue, despite the fact that a woman's monthly cycle has profound effects on her physical and mental health. It is therefore essential to take the necessary safety precautions to prevent the harm. Students may be caught in a vicious cycle of stress and dysmenorrhea resulting in missed classes and regular absences from everyday activities, which in turn causes more stress.

In the present study, we have tried to find association between dysmenorrhea and stress among female students of Universal College of Medical Sciences. It shows that dysmenorrhea was present in 80% of girls, for which more than a third tried some form of treatment, like hot water bag or analgesics; and similar proportion of girls were regularly absent in classes because of dysmenorrhea. About a third also expressed to have moderate to severe form of premenstrual symptoms. Majority of the students (81.6%) had moderate level of perceived stress.

The result of a study by Tiwari et al., in Noida, India, contradicts the result of our study wherein 82.14% students had dysmenorrhea but the mean perceived stress score among students with or without dysmenorrhea were not significantly different [3]. This may be attributed to the geographical variations, and the sample size is also far greater in our study than theirs. Similar findings were observed in a study by Karki et al., where students with dysmenorrhea had high PSS scores than students with regular menstruation; however, the difference was not statistically significant ($P > 0.05$) [5]. This study was done in Kathmandu, and sample size and their mean stress score were also comparable to ours, but it was done 5 years ago. Still, other contributing factors need to be explored in further studies.

Our correlation of dysmenorrhea with stress category showed that presence of dysmenorrhea is significantly associated with level of stress. This result is similar to the study by V. Suganthi et al., which showed the risk to have dysmenorrhea was twice as high in students who had moderate level of stress (51.41%) compared to low stress (25.35%) [1].

Statistically significant relation was found between stress and dysmenorrhea in a study done by Katwal PC et al. in Kathmandu [10]. In a similar study done in West

Bengal, India, the prevalence of dysmenorrhea among adolescent females was found to be near 90%, with varying degrees of severity. There were higher levels of stress, anxiety, and sadness in them compared to normal cycle groups [11]. Likewise Adib-Rad H et al. conducted a study in medical students of North Iran and found that students with dysmenorrhea had a significantly higher Global Severity Index (GSI) compared to those without, indicating a higher level of psychological distress [12].

In a separate investigation conducted by T. Pramanik, in Kathmandu, it was observed that the findings align with our own study [4]. In another similar study by Noviyanti A et al., a significant relationship between stress and dysmenorrhea in young women was observed with coefficient of 0.345 [13]. So this study also provides the evidence supporting a significant association between stress and dysmenorrhea like the present study. Likewise, the result of our study is also in quite consistence with the study by Wang et al in China as they observed that the risk of dysmenorrhea was greatest among women with both high stress and a history of dysmenorrhea [14].

In contrast to our findings, a study conducted by Shehzadi T done in 150 young citizens of Lahore, Pakistan, reported no significant relationship between academic stress and dysmenorrhea; though there was significant association of dysmenorrhea with insomnia. Although it is a preprint article published in 2022, it highlights the need for further investigation into the multifaceted interplay between dysmenorrhea, academic stress, and psychological well-being across different cultural contexts [15].

Overall, the aforementioned comparative results highlight the importance of implementing comprehensive interventions and control techniques that focus on addressing the physical manifestations and emotional welfare of those undergoing dysmenorrhea. The integration of holistic methodologies to tackle the various dimensions of this ailment is essential in enhancing the general well-being and scholarly achievements of the impacted individuals.

Limitations: Use of a single-centric cross-sectional design limits its generalizability and causal relation between the variables. Factors such as dietary and lifestyle habits and psychosocial states have not been taken into consideration in this study. Further studies could utilize longitudinal design in a larger sample size, which will help in addressing this issue that impacts daily life and academics of the students.

CONCLUSION

Our study highlights a significant prevalence of dysmenorrhea among female students at UCMS which is strongly correlated with perceived stress levels. It sheds new light on this issue in Rupandehi district and serves as a foundation for broader, community-based longitudinal studies. Stress management is important, with families encouraged to support students during menstruation, and students urged to seek assistance for both stress and dysmenorrhea. Educators, healthcare providers, and policymakers must address these challenges by prioritizing mental health support, stress management programs, and menstrual health resources. Future research should explore additional factors and assess dysmenorrhea's long-term impact on academic performance and well-being.

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Conflict of Interest: None declared.

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Consent: Informed written consent was obtained from all the participants before the data collection.

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Author's Contribution: PG was involved in conceptual framework, literature review, data collection and report writing. JPJ helped in data analysis, report writing and manuscript editing. BJ was involved in data collection and report writing.

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