

Association of Dysmenorrhea with Mental Health and Academic Performance among University Students

Ayesha Jamil^{1*}, Malaika Sheraz¹, Hafiza Sana Ashraf², Sana Akram³

¹Physiologic Physiotherapy Clinic, Lahore, Pakistan

²Move Better Physiotherapy Clinic, Lahore, Pakistan

³University of Sargodha, Lahore, Pakistan

*Corresponding Author

Ayesha Jamil
ayeshabutt031@gmail.com

Received: 7th September, 2023

Accepted: 13th October, 2023

Accepted: 2nd November, 2023

DOI 10.51846/jucmd.v3i1.2752



This is an open access article distributed in accordance with the Creative Commons Attribution (CC BY 4.0) license <https://creativecommons.org/licenses/by/4.0/> which permits any use, Share — copy and redistribute the material any medium or format, Adapt — rem transform, and build upon the materi for any purpose, as long as the author and the original source are properly cited. © The Author(s) 2021

Abstract

Objective: Dysmenorrhea refers to the recurring cramp-like pain experienced during menstruation. Many females experience menstrual health issues during their reproductive years, such as irregular cycles, menstrual pain, abnormal flow, and premenstrual syndrome. Therefore, this study aimed to determine the association of dysmenorrhea with mental health and academic performance among university students.

Methodology: This cross sectional study was carried out on a sample of 384 female university students aged 19 to 29 years. The data was collected using self-structured questionnaires. Numeric Pain Rating Scale (NPRS) and Depression Anxiety Stress Scale (DASS) were the outcome measure tools for determining pain and mental health. The Cumulative Grade Point Average (CGPA) grading system was used for observing academic performance. A chi-square test was applied to find out the association of dysmenorrhea with mental health and academic performance.

Results: There were 356 (92.7%) participants who were experiencing painful menstruation with a mean age of 22.97±8.79 years. The majority of females i.e., 186 (48.4%) had moderate pain. There was a statistically significant relationship between dysmenorrhea and the academic performance of students ($p<0.05$). However, no association was observed between dysmenorrhea and mental health ($p<0.05$).

Conclusion: Dysmenorrhea is highly prevalent among female university students and it has a significant impact on the academic performance of students. However, no association was found with mental health.

Keywords: Academic Performance, Depression Anxiety Stress Scale, Dysmenorrhea, Mental Health.

Introduction

Dysmenorrhea, which is also known as menstrual cramps or painful periods, refers to the recurring cramp like pain experienced during menstruation.¹ Many females experience menstrual health issues during their reproductive years, such as irregular cycles, menstrual pain, abnormal flow, and premenstrual syndrome.² It is a prevalent gynecological disorder among adult females that negatively impacts their quality of life and health.³ According to various studies, the prevalence of dysmenorrhea has been reported to be between 50 and 70 (8%).⁴ In Pakistan, 78% of females experience dysmenorrhea and female adolescents comprise 51% of the global population.⁵ Dysmenorrhea is divided into two types: primary and secondary. Primary dysmenorrhea involves painful cramps in the lower abdomen, often accompanied by sweating, headaches, nausea, vomiting, diarrhea,

and trembling. These symptoms occur just before or during menstruation (in the menstrual phase)⁶ unlike the Pre-Menstrual Syndrome (PMS), or Pre-Menstrual Dysmorphic Syndrome (PMDS) which are characterized by moderate to severe emotional and physical changes respectively, that occur days or weeks before menstruation in the luteal phase of the menstrual cycle and ends during menses.^{2,3} Secondary dysmenorrhea refers to menstrual pain that arises due to underlying pelvic pathologies like pelvic tumors, endometriosis, and other related disorders.^{7,8} Dysmenorrhea is classified as mild, moderate, or severe, based on the intensity of pain. The duration of pain usually lasts between 72 hours to entire periods and can radiate to the lower back or back of the legs.^{5,9} The primary pathogenesis for dysmenorrhea is the overproduction of uterine prostaglandins. In a normal ovulatory cycle, progesterone withdrawal triggers the release of fatty acids, leading to cramps and systemic symptoms due to leukotriene and prostaglandin cascade in the uterus.^{10,11} Many young females self-manage menstrual pain, considering dysmenorrhea normal. They use self-care methods like rest, exercise, herbal remedies, and analgesics. Non steroidal anti inflammatory drugs effectively treat menstrual pain by blocking a prostaglandin-producing enzyme.¹²⁻¹⁵ Various factors can affect the duration and severity of dysmenorrhea.⁵ These include early menarche, heavy menstrual flow, smoking, positive family history, obesity, and alcohol consumption. Work, lifestyle, pain perception, and menstrual history also play a role. Anatomical issues and emotional problems (anxiety, depression) matter too.^{6,16} It notably impacts social relationships, mental well-being, academics, and sleep, potentially leading to anxiety and depression. Mental health is crucial for females during this cycle due to natural mood swings, tension, and stress. Primary symptoms like pain negatively affect the daily life and school performance of female adolescents, leading to frequent short-term school absenteeism.^{17,18} The student experiences a lack of focus in class, inactive participation, difficulty completing homework, poor exam performance, and limited physical activity.¹⁸⁻²⁰ Severe dysmen-

orrhea can limit certain activities and impair the ability to perform daily routines.^{3,21} Dysmenorrhea is often overlooked and given lower priority compared to other health issues worldwide, despite its persistence and invisibility.²² Until now, only a limited number of studies have investigated the link between dysmenorrhea and the academic performance of adolescents in developing countries. This condition adversely impacts their quality of life, diminishes productivity, hinders their ability to attend classes, and impairs concentration on studies, subsequently affecting their academic achievements. Therefore, the objective of this research is to determine the association of dysmenorrhea with mental health, and academic performance.

Methodology

It was a cross-sectional study, conducted in six months from February 2023 to July 2023. The ethical approval of the study was taken from the Research Ethics Committee of the Sehat Medical Complex; ref # REC/SMC-106-05-2023 and was carried out according to Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines and Helsinki Principles. Informed consent was taken from participants. The objective of the study was explained to each participant and ensured to maintain confidentiality and anonymity. A sample of 384 females was selected through a convenient non-random sampling technique from different public and private sector universities in Lahore, Pakistan. The inclusion criteria of this study were the females of undergraduate and post graduate programs from different departments, aged between 19 to 29 years, 23. Those females who suffered from secondary dysmenorrhea, PMDS, secondary menopause, with a past or current medical condition, gynecological history i.e., PCOS, any systemic illness, or undergone any major surgical history, or being pregnant or breastfeeding were excluded.^{2,24} Data were collected through a structured questionnaire^{25,26} consisting of 30 questions categorized into demographic details, reproductive health, dysmenorrhea characteristics, pain intensity assessed via NPRS, mental health assessed using the Depression Anxiety Stress Scale (DASS) questionnaire, and academic performance measured by Cumulative Grade Point Assessment (CGPA). For DASS-21, a cutoff value of 37 was used depicting that those participants having a score higher than 37 had more mental health issues. The dataset was coded, entered, and analyzed using SPSS version 22. Pearson's Chi-square test was utilized to determine the association of dysmenorrhea, with mental health, and academic performance. A p-value of 0.05 was set as significant.

Results

The summary of the socio demographic details and educational information of the participants is given in Table 1. It shows that the mean age of participants was 22.97±8.79 years, and the body mass index was 21.8±3.4 kg/m². The majority i.e., 172 (44.8%) were in the 5th year of the study program, 341 (88.8%) were single and 357 (93%) belonged to middle-class families. Menstrual patterns and characteristics of dysmenorrhea are summarized in Table 2. This table provides valuable insights into The menstrual experiences and dysmenorrhea patterns among

the surveyed individuals.

Table 1: Demographic Data of Participants

Variables	Categories	Mean ± SD	
Age	In years	22.97 ± 8.79	
Height	In cm	161.54 ± 7.87	
Weight	In kg	56.732 ± 10.01	
BMI	In kg/cm ²	21.8 ± 3.402	
		Frequency (n)	Percentage (%)
Academic Year of Study	1 st year	98	25.5
	2 nd year	58	15.1
	3 rd year	26	6.8
	4 th year	30	7.8
	5 th year	172	44.8
	Masters	14	3.7
Marital Status	Single	341	88.8
	Married	43	11.2
Social Class	Lower Class	5	1.3
	Middle Class	357	93.0
	Upper Class	22	5.7
Lifestyle Habits	Smoking	2	0.5
	Alcohol	2	0.5
	Others	3	0.8
	None	376	97.9

Table 2: Association of dysmenorrhea with mental health and academic performance

Variables	Dysmenorrhea			Chi-Square, p-value
	Categories	Yes	No	
		N (%)	N (%)	
CGPA	2.5 - 3.0	140 (36.4)	6 (1.5)	124.23, P= 0.03
	3.1 - 3.5	174 (45.3)	10 (2.6)	
	3.6 - 4.0	42 (11.0)	12 (3.12)	
DASS-21 Score	> 37	67 (17.4)	5 (1.3)	0.01, p=0.90
	≤ 37	289 (75.3)	23 (6.0)	

The results reveal that a larger portion of participants experienced menarche between 13 to 14 years, with most having a regular 21 to 28-day cycle, lasting three to five days. Painful menstruation was prevalent (92.7%), typically starting on or just before the first day, with lower abdomen pain being most common, and varying in intensity from mild to moderate. Table 3 represents the relationship of dysmenorrhea with the mental health and academic performance of participants. The results of the chi-square analysis showed that there is an association of dysmenorrhea with academic performance (p<0.05) and around 140 (36.4%)

participants with dysmenorrhea had a low CGPA in the range of 2.5-3.0.

Table 3: Menstrual pattern and characteristics of dysmenorrhea of participants

Variables	Categories	Frequency (n)	Percentage
Age at Menarche	12 years	104	27.1
	13-14 years	180	46.9
	≥15 years	100	26.0
Menstrual Regularity	Yes	299	77.9
	No	85	22.1
Avg. length of menstrual cycle	<21 days	61	15.9
	21-28 days	181	47.1
	28-35 days	101	26.3
	>35 days	41	10.7
Duration of menstrual flow (days)	1-3 days	73	19.0
	3-5 days	155	40.4
	5-7 days	135	35.2
	More than 7 days	21	5.5
No. of pads used (in a day)	<3 pads	205	53.4
	3-5 pads	136	35.4
	5-7 pads	28	7.3
	>7 pads	15	3.9
Painful Menstruation	Yes	356	92.7
	No	28	7.3
Location of Pain	Lower abdomen	187	48.7
	Pelvic pain	42	10.9
	Back pain	85	22.1
	Groin pain	9	2.3
	Leg and thigh pain	61	15.9
Pain Onset	1 day before menstrual flow	112	29.2
	Same day to menstrual flow	195	50.8
	One day after the menstrual flow	77	20.1
Free from pain after onset of periods	After 8 hours	133	34.6
	After 8-72 hours	173	45.1
	After 3 days or more	38	30.3
Average Intensity of Pain	No Pain	19	4.9
	1-3 (Mild)	112	29.2
	4-6 (Moderate)	186	48.4

The analysis of DASS-21 revealed that there is no statistically significant association of mental health with dysmenorrhea

(p=0.90) and about 289 (75.3%) participants with dysmenorrhea had a DASS-21 score of less than 37.

Discussion

Dysmenorrhea holds its place as the predominant menstrual concern among adolescent females.¹⁹ Nonetheless, research on this subject, especially within Pakistan's context, remains limited. In this study, dysmenorrhea prevalence was found to be 92.7% among the participants. The pain, predominantly situated in the lower abdomen, exhibited moderate intensity and frequent occurrence. Its influence on students' academic performance was evident, although it did not appear to significantly affect mental health. A study on the prevalence of dysmenorrhea among students in the Turkish population also found a high i.e., 72.7%,²⁰ while a study on Serbian university students has a relatively less prevalence of around 29.9%. This occurrence is linked to factors such as coffee consumption, extended menstrual bleeding, and a positive family history.²¹ Likewise, a cross-sectional study on medical students at Mohiuddin Islamic University in Mirpur Azad Kashmir revealed a 56% prevalence of dysmenorrhea. It also reported the common symptoms among those experiencing dysmenorrhea included reduced concentration (65%), limited participation in social activities, disrupted sleep (64%), mood swings (58%), and headaches (56%) and concluded that this menstrual discomfort significantly impacts the academic performance and daily activities of female medical students at the university.²²

Similarly, a study conducted at Debre Berhan University in Ethiopia highlighted that dysmenorrhea significantly impacted female university students' class attendance, academic performance, and concentration during exams. Consistent outcomes arose due to the selection of the population having a positive family history, which was not physically active and struggled to maintain focus on their studies.^{23,24}

Vesga *et al.*, conducted a study in 2008 examining the distinctions in social support, quality of life, and mental health problems among females with menstruation issues. Their findings indicated a result contrary to our study, that females facing menstruation problems had a notably elevated prevalence of mental health issues (p<0.05). Conversely, these findings highlight the substantial influence of dysmenorrhea on academic performance (p=0.03), aligning with our study's outcome. Furthermore, Iqra *et al.*, conducted a study encompassing 150 young females aged 12 to 25 in Lahore City. It stated that there was no significant association between academic stress and dysmenorrhea. Thus, the study's conclusion contradicted the present results that indicate dysmenorrhea might affect academic performance.²⁶

Furthermore, Sarwar *et al.* (2021) conducted a study encompassing 150 young females aged 12 to 25 in Lahore City.²⁸ It stated that there was no significant association between academic stress and dysmenorrhea. Thus, the study's conclusion contradicted the present results that indicate dysmenorrhea might affect academic performance. This incongruence might be attributed to the fact that their selected population exhibited a higher quality

of life, greater physical activity, and employed home remedies to manage dysmenorrhea.²⁷

Painful menstrual cramps and absenteeism from university might be a reason for low CGPA. However, this pain-related distress was not found to harm the mental health of the participants in this study. One significant reason for not observing an association between dysmenorrhea and mental health may be that dysmenorrhea is typically of lesser severity and shorter duration compared to other menstrual issues like premenstrual syndrome (PMS) or Premenstrual Dysphoric Disorder (PMDD). Moreover, the observed relationship between mental health and dysmenorrhea might be due to random variation.

Nonetheless, about 17% of participants who reported higher DASS-21 scores experienced dysmenorrhea, suggesting a potential clinical relevance. From a clinical perspective, this observation might raise concerns about the impact of mental health on the experience of dysmenorrhea and the potential need for interventions or support for these students. Further research with a larger sample size and consideration of additional variables with objective outcome measure tools may provide a more comprehensive understanding of this relationship.

Conclusion

Dysmenorrhea is highly prevalent among female university students, and it has a significant impact on academic performance. The physical and emotional discomfort associated with it can disrupt a student's ability to focus, attend classes regularly, and excel academically. However, no association was seen with mental health in this study.

Limitations

Screening of participants for mental health assessment was only done at the time of data collection, which raises concerns about the potential presence of recall bias. This study focuses on only one health condition related to the menstrual cycle.

Recommendation

It is recommended to conduct studies considering cultural, dietary, and genetic factors. Further research may be needed to explore the underlying factors contributing to this association and its implications for academic success. Other health issues related to the menstrual cycle including PMS and PMDS should also be explored. Open communication between healthcare providers and young women should be encouraged to facilitate early diagnosis, proper management, and individualized support plans. Student support systems should be developed within educational institutions, to provide academic accommodations for those experiencing dysmenorrhea-related challenges.

Authors' Contributions: AJ contributed in conceptual and design, analysis, interpretation, drafting of the article and finalization of the manuscript, MS in acquisition of data, analysis, interpretation, and drafting of the article. SA analysis of the data and finalization of the manuscript, HS in interpretation of data and

revising it critically for important intellectual content.

References

1. Shehzadi T, Rida M, Imtiaz R. Association of Insomnia and Academic Stress with the onset of Dysmenorrhea among females of Lahore, Pakistan. *ScienceOpen Preprints*. 2022 Jun 1.
2. Chong TF, Ser XE, Ooi LK, Wong LS. The Effects of Dysmenorrhea to Lifestyle: A Case Study on Female Students in Malaysia. *INTI Journal L*. 2019; 2019 (53).
3. Adib-Rad H, Kheirkha F, Faramarzi M, Omidvar S, Basirat Z, Ahmadi MH. Primary dysmenorrhea associated with psychological distress in medical sciences students in the north of Iran: a cross-sectional study. *International Journal of Fertility & Sterility*. 2022 Jul;16(3):224.
4. Sachedina A, Todd N. Dysmenorrhea, endometriosis and chronic pelvic pain in adolescents. *Journal of clinical research in pediatric endocrinology*. 2020 Feb 1;12(Suppl 1):7-17.
5. Vincenzo De Sanctis M, Soliman A, Bernasconi S, Bianchin L, Bona G, Bozzola M, et al. Primary dysmenorrhea in adolescents: prevalence, impact and recent knowledge. *Pediatric Endocrinology Reviews*. 2015 Dec; 13(2):465-473.
6. Harada T. Dysmenorrhea and endometriosis in young women. *Yonago Acta Medica*. 2013 Dec; 56(4):81.
7. Iacovides S, Avidon I, Baker FC. What we know about primary dysmenorrhea today: a critical review. *Human Reproduction Update*. 2015 Nov1;21(6):762-778.
8. Fernández-Martínez E, Onieva-Zafra MD, Parra-Fernández ML. The impact of dysmenorrhea on quality of life among Spanish female university students. *International Journal of Environmental Research and Public Health*. 2019 Mar;16 (5):713-714.
9. Abu Helwa HA, Mitaeb, Al-Hamshri S, Sweileh wm. Prevalence of dysmenorrhea and predictors of its pain intensity among Palestinian female university students. *Biomed Central Journal Women's Health*. 2018 Dec;18(1):1-1.
10. Samani RO, Hashiani AA, Razavi M, Vesali S, Rezaeinejad M, Maroufizadeh S, et al. The prevalence of menstrual disorders in Iran: A systematic review and meta-analysis. *International Journal of Reproductive Biomedicine*. 2018 Nov;16(11):665.
11. Almanasef M, Alqarni H. Self-care strategies for the management of primary dysmenorrhea among young women in Asir region, Saudi Arabia: a cross-sectional study. *European Review for Medical & Pharmacological Sciences*. 2023 January 1;27(1).
12. Armour M, Parry K, Manohar N, Holmes K, Ferfolja T, Curry C, et al. The prevalence and academic impact of dysmenorrhea in 21,573 young women: a systematic review and meta-analysis. *Journal of Women's Health*. 2019 Aug 1;28(8):1161-1171.
13. Harel Z. Dysmenorrhea in adolescents. *Annals of the New York Academy of Sciences*. 2008 Jun;1135(1):185-95.
14. Zahradnik HP, Hanjalic-Beck A, Groth K. Nonsteroidal anti-inflammatory drugs and hormonal contraceptives for pain relief from dysmenorrhea: a review. *Contraception*. 2010 Mar 1;81(3):185-196.
15. Ashraf T, Riaz S, Atta S, Ikram A, Shehzadi hk. Prevalence of dysmenorrhea and impact on young medical students; a cross sectional study on students of medical colleges of Lahore, Pakistan. *Rawal Medical Journal*. 2020 Apr ;45(2):430-433.
16. Šimić G, Babić Leko M, Wray S, Harrington C, Delalle I, Jovanov-Mi et al. Tau protein hyperphosphorylation and aggregation in Alzheimer's disease and other tauopathies, and possible neuroprotective strategies. *Biomolecules*. 2016 Jan 6;6(1):6.

17. Derseh BT, Afessa N, Temesgen M, Semayat YW, Kassaye M, Sie-ru S. Prevalence of dysmenorrhea and its effects on school performance: a cross-sectional study. *Journal of Women's Health Care*. 2017;6(2):361.
18. Gedefaw G, Wondmieneh A, Getie A, Waltengus F, Demis A, Wang CC. Dysmenorrhea and associated symptoms in Ethiopia: A systematic review and meta-analysis. *Journal of Endometriosis and Pelvic Pain Disorders*. 2022 Jun ;14(2):106-119.
19. Azagew AW, Kassie DG, Walle TA. Prevalence of primary dysmenorrhea, its intensity, impact and associated factors among female students' at Gondar town preparatory school, Northwest Ethiopia. *BMC women's health*. 2020 Dec;20:1-7.
20. Hailemeskel S, Demissie A, Assefa N. Primary dysmenorrhea magnitude, associated risk factors, and its effect on academic performance: evidence from female university students in Ethiopia. *International journal of women's health*. 2016 Sep 19:489-96.
21. Al-Husban N, Odeh O, Dabit T, Masadeh A. The influence of lifestyle variables on primary dysmenorrhea: a cross-sectional study. *International Journal of Women's Health*. 2022 Apr 13:545-53.
22. Fernández-Martínez E, Onieva-Zafra MD, Parra-Fernández ML. The impact of dysmenorrhea on quality of life among Spanish female university students. *International journal of environmental research and public health*. 2019 Mar;16(5):713.
23. Mesle TT, Ayalew HG, Syoum AT, Antehneh TA. Impact of Dysmenorrhea on Academic Performance Among Haramaya University Undergraduate Regular Students, Eastern Ethiopia. *Frontiers in Reproductive Health*. 2022 Jul 6;4:939035.
24. Fernández-Martínez E, Onieva-Zafra MD, Parra-Fernández ML. The impact of dysmenorrhea on quality of life among Spanish female university students. *International journal of environmental research and public health*. 2019 Mar;16(5):713.
25. Vesga-Lopez O, Blanco C, Keyes K, Olfson M, Grant BF, Hasin DS. Psychiatric disorders in pregnant and postpartum women in the United States. *Archives of general psychiatry*. 2008 Jul 7;65(7):805-15.
26. Tadese M, Kassa A, Muluneh AA, Altaye G. Prevalence of dysmenorrhoea, associated risk factors and its relationship with academic performance among graduating female university students in Ethiopia: a cross-sectional study. *BMJ open*. 2021 Mar 1;11(3):e043814.
27. Al-Husban N, Odeh O, Dabit T, Masadeh A. The influence of lifestyle variables on primary dysmenorrhea: a cross-sectional study. *International Journal of Women's Health*. 2022 Apr 13:545-53.
28. Sarwar U, Rauf UJKMUJ. Social support, quality of life and mental health problems among females with and without menstruation problems: a comparative study. 2021;13(4):206-10.