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PREVALENCE, DETERMINANTS, AND SELF-MEDICATION PRACTICES OF DYSMENORRHEA AMONG FEMALE UNIVERSITY STUDENTS IN LAHORE, PAKISTAN

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Dysmenorrhea, self-medication, menstrual pain, university students, healthcare-seeking behavior, Pakistan.

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Abstract

Aim: *This study aimed to determine the prevalence and severity of dysmenorrhea among female university students in Lahore, Pakistan, to identify associated menstrual, lifestyle, and psychosocial factors, and to describe self-medication and healthcare-seeking practices.*

Settings and Design: *A quantitative, cross-sectional study was conducted at Riphah International University, Gulberg campus, Lahore, between January and April 2026.*

Methods and Materials: *A structured, self-administered questionnaire adapted from a previously validated instrument was distributed to female undergraduate and postgraduate students across five academic disciplines. The tool was piloted among 30 students prior to use. Following exclusion of incomplete responses, 383 questionnaires were retained.*

Statistical analysis used: *Descriptive statistics, the chi-square test, and Pearson correlation, with internal consistency of the impact scale assessed by Cronbach's alpha; analysis was performed in SPSS version 26.*

Results: *All 383 (100%) participants reported experiencing menstrual pain, with 204 (53.3%) affected during every cycle; 94 (24.6%) reported severe or very severe pain. Dysmenorrhea significantly interfered with class concentration, academic deadlines, and social participation (all $p<0.001$). Self-medication was the predominant management approach (180, 47.0%, pharmacological), most often with paracetamol (160, 41.8%), guided by personal experience (153, 39.9%); only 86 (22.5%) had ever sought formal medical consultation. Living arrangement was the only variable significantly associated with the occurrence of dysmenorrhea ($\chi^2=7.99$, $p=0.046$).* ***Conclusion:*** *Dysmenorrhea was widespread among this population and carried a substantial academic and social burden, yet is managed predominantly through self-medication rather than professional care, highlighting the need for pharmacist-led counseling and university-based menstrual health education.*

1. INTRODUCTION

Dysmenorrhea, defined as painful cramping in the lower abdomen occurring just before or during menstruation, is among the most common

Frontier in Medical & Health Research

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gynecological complaints affecting women of reproductive age worldwide.[1,2] Beyond physical discomfort, the menstrual cycle can also bring anxiety, embarrassment, and social withdrawal, compounding its overall burden.[1] Dysmenorrhea is broadly classified as primary, occurring without identifiable pelvic pathology and typically beginning within six to twelve months of menarche once ovulatory cycles are established, or secondary, arising from a known pelvic condition such as endometriosis, adenomyosis, or pelvic inflammatory disease.[3,4] The pathophysiology of primary dysmenorrhea is largely attributed to leukotrienes and vasopressin have also been implicated.[5,6]

Global prevalence estimates for dysmenorrhea vary widely, from roughly 16% to 91% of women of reproductive age, reflecting differences in study populations and diagnostic criteria, with severe pain reported in 2% to 29% of affected women.[2] A systematic review and meta-analysis of 336 studies across 70 countries between 2000 and 2024 reported a pooled global prevalence of 71.3%, rising to 78.4% among university students specifically.[7] Comparable figures have been reported among university and medical students elsewhere: 80.9% across six universities in Lebanon,[3] and 80.1% among female medical students in Saudi Arabia.[8] Dysmenorrhea has also been consistently linked to reduced academic performance. In Ethiopia, related school absenteeism has been associated with poorer academic performance among university students.[9]

In Pakistan, prevalence estimates are similarly high: a study among female medical students in Rawalpindi reported 83.2%,[10] and studies conducted in Lahore and Sargodha have likewise documented a substantial burden of dysmenorrhea alongside its detrimental effect on quality of life.[11,12] Menstruation remains a culturally sensitive subject in Pakistan, where open discussion of menstrual symptoms is often discouraged.[12] Consequently, many young women manage dysmenorrhea privately through self-medication, using over-the-counter analgesics, herbal preparations, or home remedies, rather than seeking formal medical care.[13,14] Self-medication, defined by the World Health Organization as the selection and use of medicines by individuals to treat self-recognized symptoms without consulting a health professional,[15] carries risks when practiced without adequate knowledge of dosage, contraindications, or drug interactions, including gastrointestinal bleeding from unsupervised non-steroidal anti-inflammatory drug (NSAID) use.[16,17] University students are considered particularly vulnerable to irrational self-medication because of academic stress, irregular routines, peer influence, and easy access to medicines from community pharmacies without a prescription.[13,14]

Despite the substantial burden documented internationally, the determinants of dysmenorrhea and the specific self-medication behaviors of female university students in Pakistan remain insufficiently studied. Most existed on medical or nursing students at single institutions, leaving a gap in understanding how dysmenorrhea and its self-management are experienced across the broader, multidisciplinary university population. This study therefore aimed to determine the prevalence and severity of dysmenorrhea, to identify menstrual, lifestyle, and psychosocial factors associated with it, and to describe self-medication practices and healthcare-seeking behavior among female university students in Lahore, Pakistan.

2. Subjects and Methods

2.1. Study Design

This was a quantitative, descriptive cross-sectional study designed to determine the prevalence, determinants, and self-medication practices related to dysmenorrhea among female university students in Lahore, Pakistan.

2.2. Study Settings

The study was conducted at the Gulberg campus of Riphah International University, Lahore, among female students enrolled in Pharmacy, Allied Health Sciences, Social Sciences, Computer Science, and

2.7. Sample Size

The minimum required sample size was calculated using the Cochran formula for

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estimating a population proportion:

$n = Z^2pq / e^2$

where Z is the standard normal deviate at the 95% confidence level (1.96), p is the estimated proportion (set conservatively at students in Pakistan, particularly outside medical disciplines, remain insufficiently characterized. Most local studies have focused Management Sciences programs. Data were collected between January and April 2026.

2.3. Study Population

The target population comprised female students aged 18–40 years enrolled in undergraduate and postgraduate (MPhil/PhD) programs at the study site.

2.4. Inclusion Criteria

Female students currently enrolled at the university, aged 18 years or older, who had attained menarche and provided informed consent were eligible. Students with a pre-existing, formally diagnosed gynecological condition were not excluded provided they otherwise met these criteria.

2.5. Exclusion Criteria

Students who were pregnant at the time of data collection and those who declined consent were excluded.

2.6. Sampling Technique

Participants were recruited by convenience sampling across academic disciplines, with questionnaires distributed to randomly encountered eligible students within each discipline to minimize selection bias.

0.5 to maximize the required sample size), q = 1 − p, and e is the margin of error (5%). This yielded a minimum requirement of approximately 384 participants. Questionnaires were distributed to 400 students; after excluding incomplete or invalid responses, 383 questionnaires were retained for final analysis.

2.8. Study Instrument and Data Collection

Data were collected using a 29-item structured, self-administered questionnaire adapted from the instrument used by Adeyeye et al. in a comparable study among female medical students in Nigeria,[18] with modifications to incorporate self-medication and healthcare-seeking constructs relevant to this population. The questionnaire was piloted among 30 students who were not included in the final sample to assess clarity and validity. The final instrument comprised five sections: (A) sociodemographic characteristics; (B) menstrual history and pain characteristics; (C) perceived impact of dysmenorrhea on academic, social, and emotional well-being, assessed using a five-point Likert scale; (D) self-medication practices, including pain-management strategies, medicine preferences, sources of information, frequency of use, perceived effectiveness, and package-insert reading habits; and (E) healthcare-seeking behavior and lifestyle factors, including sleep, physical exercise, perceived stress, and history of formal gynecological consultation.

2.9. Data Management and Analysis

The primary outcomes were the occurrence and severity of dysmenorrhea and the pattern of self-medication practices. Explanatory variables included sociodemographic characteristics, menstrual history, and lifestyle and psychosocial factors. Data were

3. Results

3.1. Sociodemographic and Menstrual Characteristics

A total of 383 female university students completed the questionnaire and were included in the analysis. Figure 1 summarizes

analyzed using IBM SPSS Statistics version 26. Descriptive statistics (frequencies and percentages) summarized categorical variables. The chi-square test was used to examine associations between categorical variables, including the occurrence of dysmenorrhea and pain severity, and selected explanatory variables. Pearson correlation was used to assess the relationship between pain severity and perceived self-medication effectiveness. Internal consistency of the six-item perceived-impact scale was assessed using Cronbach's alpha. Because the occurrence

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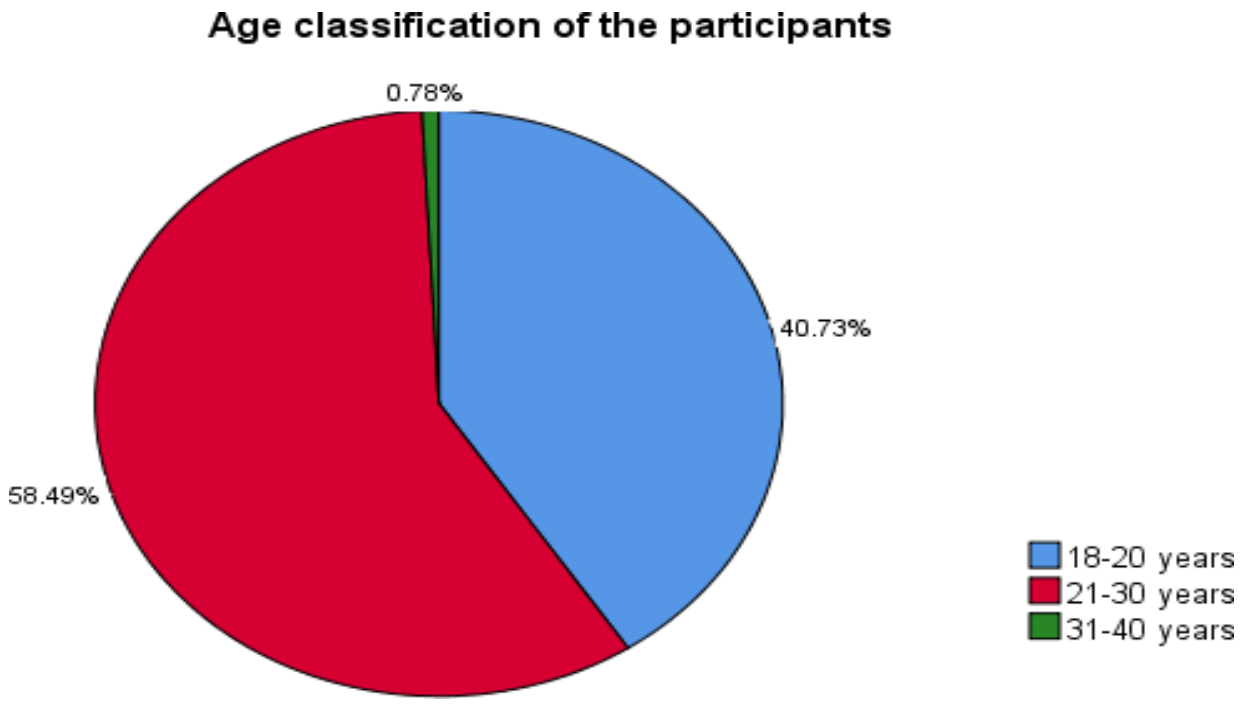
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of dysmenorrhea in this sample was almost universal, the outcome distribution did not support stable multivariable regression modeling of dysmenorrhea presence or absence; associations with pain severity, which retained meaningful variation across four categories, were therefore emphasized in the inferential analysis. Statistical significance was set at $p \leq 0.05$.

2.10. Ethical Consideration

Ethical approval was obtained from the Riphah Institute of Pharmaceutical Sciences Ethics Committee, Riphah International University (reference: RIPS/LHR/GUL/469). Written and verbal information about the study was provided to all participants, who gave informed consent before completing the questionnaire; participation was voluntary, and responses were kept confidential.

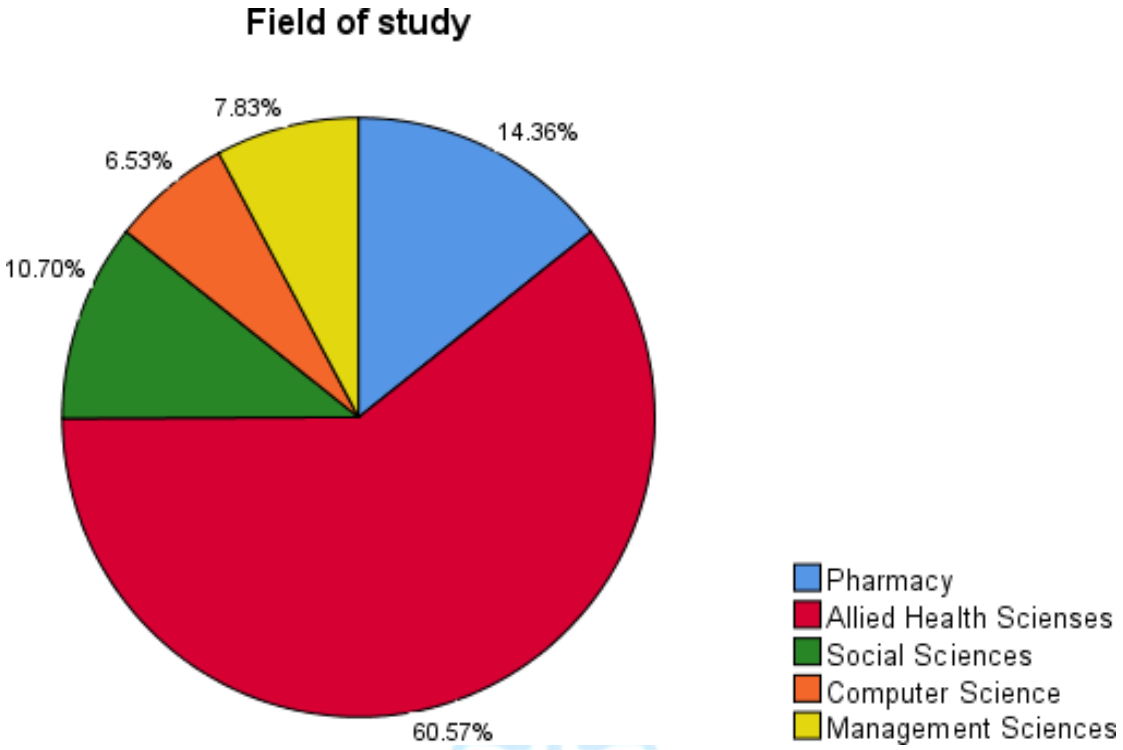
their sociodemographic profile. Most participants, 224 (58.5%), were aged 21–30 years, and the majority, 352 (91.9%), were undergraduate students. Participants from Allied Health Sciences made up the largest disciplinary group, 232 (60.6%), while most, 288 (75.2%), lived with their families.

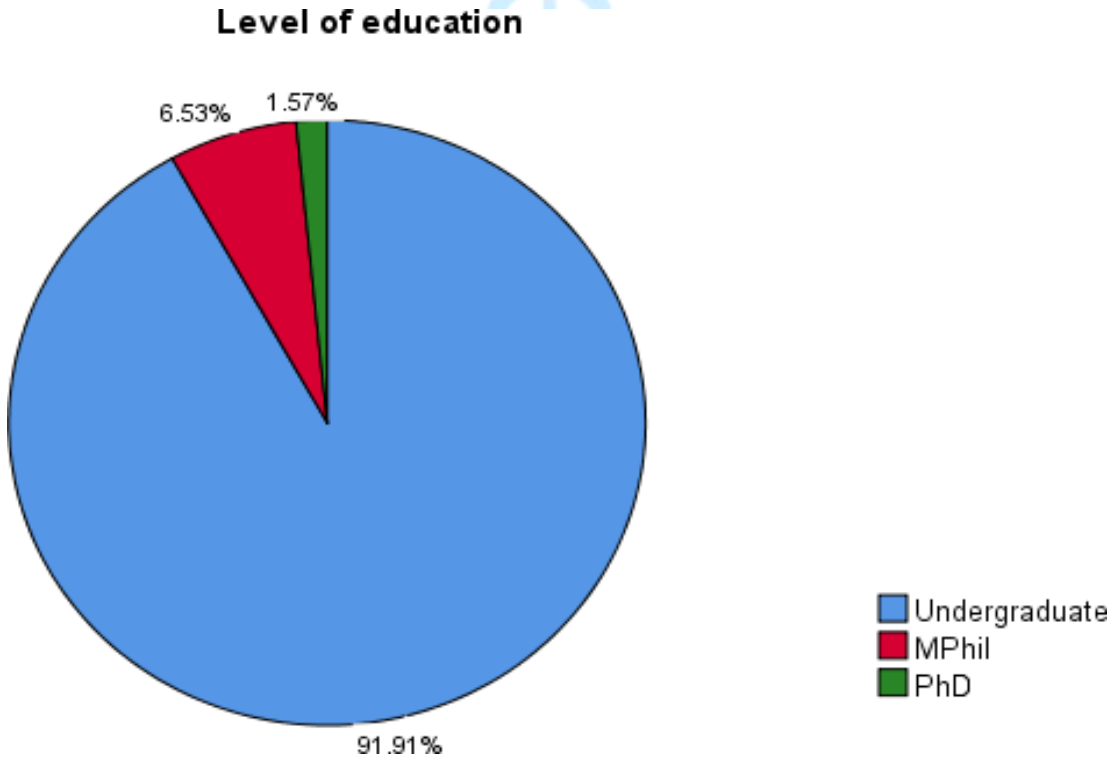


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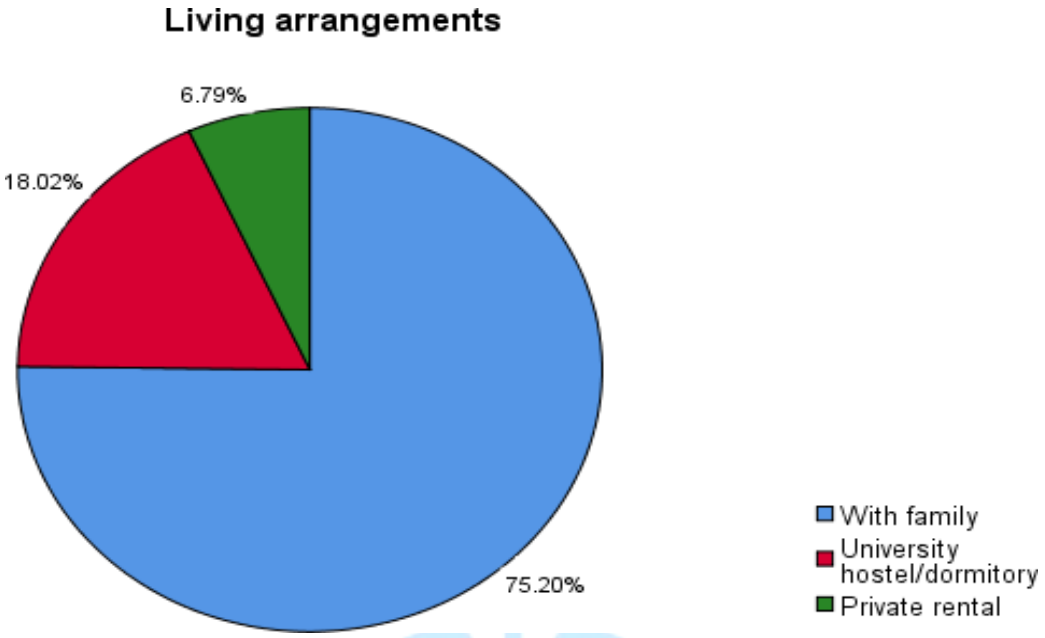


Figure 1. Sociodemographic characteristics of the participants (N=383)

Regarding menstrual history, 215 (56.1%) participants reported menarche between 13 and 15 years of age, and 242 (63.2%) reported a regular menstrual cycle length of 21–35 days. Most participants, 221 (57.7%), reported a flow duration of 3–5 days, and 281 (73.4%) described their usual flow volume as moderate.

All 383 (100%) participants reported experiencing menstrual pain, with 204 (53.3%) experiencing it during every menstrual cycle and 148 (38.6%) frequently, in most cycles; the remaining 31 (8.1%) experienced it occasionally. Pain severity was most often rated as moderate, 190 (49.6%), followed by mild, 99 (25.8%);severe or very severe pain was reported by 94 (24.6%) of participants overall.

3.2. Perceived Impact, Self-Medication, and Healthcare-Seeking Behavior

Menstrual pain was reported to interfere with concentration in class by 196 (51.2%) participants and to cause missed classes, examinations, or academic deadlines by 152 (39.7%). Participation in social or recreational activities was limited by dysmenorrhea for 176 (45.9%) participants,

and 200 (52.2%) reported that dysmenorrhea caused them anxiety or stress; however, 161 (42.0%) participants felt they received adequate emotional support from family or friends. Beliefs that lifestyle factors influenced pain severity were most commonly held for dietary habits, 188 (49.1%), followed by physical activity, 141 (36.8%), sleep patterns, 132 (34.4%), and caffeine intake, 127 (33.1%).

Self-medication was the predominant approach to managing menstrual pain: 180 (47.0%) participants used pharmacological methods, 140 (36.6%) used non-pharmacological methods such as heat application, rest, or herbal tea, and 44 (11.5%) used herbal or traditional remedies, while 19 (5.0%) reported no specific management strategy. Paracetamol was the most preferred medicine, used by 160 (41.8%) participants, followed by NSAIDs, 47 (12.3%), and combination regimens, 25 (6.5%); 151 (39.4%) participants reported not using any medication. Among those who self-medicated, decisions were most often guided by previous personal experience, 153 (39.9%), and traditional or home remedies or personal belief, 130 (33.9%), rather than media, 58 (15.1%), or advice from family or friends, 42 (11.0%). Most participants, 179

Frontier in Medical & Health Research

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(46.7%), had never used medication in a given cycle, while 122 (31.9%) used it once. On a 0–10 effectiveness scale, 262 (68.4%) participants rated their self-medication as effective or very effective, and 155 (40.5%) reported rarely or never reading the medicine package insert before use.

Regarding general health awareness and healthcare-seeking behavior, only 86 (22.5%) participants had ever sought formal medical consultation specifically for menstrual pain, while 283 (73.9%) had not; among those who had not consulted a doctor, the most common reasons were lack of time, 158 (41.3%), and social stigma or embarrassment, 117 (30.5%). Most participants, 219 (57.2%), reported 5–7 hours of sleep per night, and 152 (39.7%) engaged in moderate-to-vigorous physical exercise one to two times per week.

Perceived stress related to university life was rated as moderate by 172 (44.9%) participants and severe by 80 (20.9%).

3.3. Determinants of Occurrence and Severity

Table 1 presents the results of chi-square analysis of factors associated with the occurrence and severity of dysmenorrhea. Because dysmenorrhea occurred in virtually all participants, only current living arrangement was significantly associated with its occurrence ($\chi^2 = 7.99$, df = 3, $p = 0.046$). When pain severity was examined instead, its interference with class concentration ($\chi^2 = 46.567$, $p<0.001$), missed classes or deadlines ($\chi^2 = 57.187$, $p<0.001$), and limitation of social activities ($\chi^2 = 51.419$, $p<0.001$) were all significantly associated with severity (Figure 2), whereas beliefs about dietary habits, caffeine intake, sleep patterns, physical activity, and the perceived effectiveness of pharmacological methods were not significantly associated with severity (all $p>0.05$). Pain severity score and perceived self-medication effectiveness score were only weakly and non-significantly correlated (Pearson $r = 0.088$, $p = 0.085$). The six-item perceived- impactscale demonstrated borderline internal consistency (Cronbach's $\alpha = 0.682$).

Table 1. Chi-square analysis of factors affecting severity of dysmenorrhea

Variable	Chi-sq	df	p-value	Significant?
Pain interferes with concentration	46.567	12	0.000	Yes
Pain causes missed classes/deadlines	57.187	12	0.000	Yes
Pain limits social activities	51.419	12	0.000	Yes
Dietary habits	17.472	12	0.133	No
Caffeine intake	10.140	12	0.604	No
Sleep patterns	8.635	12	0.734	No
Physical activity	9.273	12	0.679	No
Effectiveness of pharmacological methods in reducing pain	15.277	9	0.084	No

Volume 4, Issue 3, 2026

Frontier in Medical & Health Research

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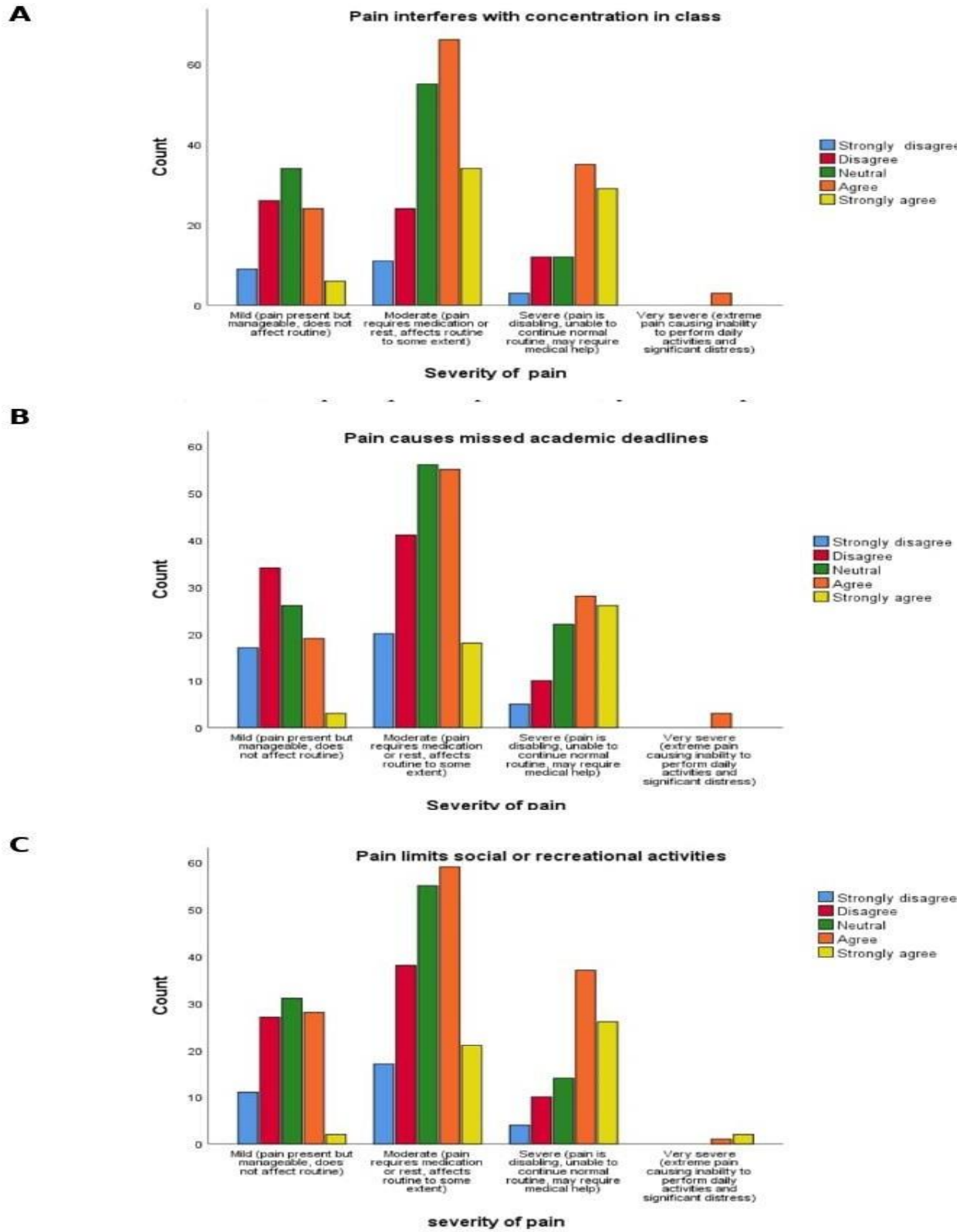


Figure 2. Distribution of pain severity against (A) concentration in class, (B) missed academic deadlines, and (C) limitations in social or recreational activities.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

4. Discussion

This study found that dysmenorrhea was essentially universal among female university students in Lahore, with all 383 participants reporting some degree of menstrual pain and more than half experiencing it during every cycle. This figure exceeds the pooled global prevalence of 71.3% reported across 70 countries,[7] the 80.9% reported among university students in Lebanon,[3] the 80.1% reported among Saudi medical students,[8] and even the 83.2% reported among Pakistani medical students in Rawalpindi.[10] Several factors may account for this unusually high figure. First, the questionnaire used a broad screening definition, classifying any degree of menstrual pain, from occasional to every cycle, as dysmenorrhea, rather than requiring a minimum severity threshold, a methodological choice known to inflate prevalence estimates relative to more restrictive definitions.[2] Second, the private, self-administered nature of the questionnaire may have encouraged more complete disclosure of a symptom that carries social stigma in the local context.[12] Third, given the consistency of this finding with other high estimates from the region, a genuinely high true prevalence in this specific population cannot be excluded. Notably, the proportion of participants reporting severe or very severe pain, 24.6%, was closely comparable to severity distributions reported elsewhere (24–37%),[3,8] suggesting that while the overall prevalence figure is unusually high, the distribution of pain severity among affected students is broadly consistent with international patterns.

Menstrual history variables such as age at menarche and cycle length, which have some of the strongest evidence in the international literature,[2] could not be meaningfully tested against occurrence in this sample for the same reason, and this should be read as a limitation of statistical power rather than evidence against a true association. When examined against pain severity, however, a variable with meaningful variation across four categories, dysmenorrhea's interference with class concentration, academic deadlines, and social participation was strongly and significantly associated with severity, underscoring the substantial functional impact of more severe dysmenorrhea on students' academic and social lives, consistent with reports linking dysmenorrhea to school absenteeism and reduced academic performance elsewhere.[9] The significant association between perceived emotional support and stress or anxiety attributable to menstrual pain ($\chi^2 = 48.133$, $df = 16$, $p<0.001$) reinforces this enabling-factors interpretation: participants who felt adequately supported by family or friends were less likely to report high stress and anxiety, suggesting that social support may buffer the psychosocial, if not the physical, burden of dysmenorrhea.

Self-medication, rather than formal healthcare-seeking, was clearly the dominant response to dysmenorrhea in this population, with fewer than a quarter of participants ever having consulted a doctor specifically for menstrual pain. This mirrors patterns reported among university students elsewhere in Pakistan and the region.[13,14] Paracetamol was preferred over NSAIDs despite NSAIDs' stronger pathophysiological rationale as first-line treatment for prostaglandin-mediated menstrual pain,[6,16] a pattern also noted in other self-medication studies among students.[14] Decisions to self-medicate were driven mainly by personal experience and traditional belief rather than professional advice or reliable information sources, and a substantial proportion of participants rarely or never read medicine package inserts before use, raising safety concerns given the known risks of unsupervised NSAID and analgesic use.[16,17] The weak, non-significant correlation between pain severity and perceived self-medication effectiveness ($r = 0.088$) further suggests that self-medication in this population is habitual rather than adjusted to the intensity of pain experienced, consistent with broader observations that self-medication decisions tend to be shaped more by habit and informal information sources than by rational evaluation of symptom severity.[14] Among the majority who had not sought formal consultation, the leading reasons, lack of time and social stigma, suggest that many students may not view even severe menstrual pain as a legitimate, treatable clinical

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

concern, rather than facing purely structural barriers to care.

Several limitations should be considered. The cross-sectional design permits identification of association but not causation. The near-complete outcome imbalance substantially limited the power of the determinant analysis and precluded stable multivariable modeling of dysmenorrhea occurrence. Self-reported measures of pain, self-medication effectiveness, and consultation history may be subject to recall and social desirability bias. The six-item impact scale showed borderline internal consistency (Cronbach's $\alpha = 0.682$), slightly below the conventional 0.70 threshold. Finally, the study did not clinically distinguish primary from secondary dysmenorrhea, and findings, drawn from a single university in Lahore, may not generalize to other cities or to young women outside university settings.

Recommendations

- Community pharmacists are well placed to provide brief, targeted counseling on rational analgesic selection, dosing, and safety at the point of sale, given that self-medication with paracetamol was the predominant response to dysmenorrhea in this population.
- University health services should reframe severe or disabling menstrual pain as a legitimate, treatable clinical concern rather than a normal inconvenience, to encourage earlier and more timely consultation.
- Menstrual health education, integrated into orientation or wellness programming across all faculties rather than medical disciplines alone, may help normalize open discussion and reduce the stigma and embarrassment that currently deter many students from seeking care.
- Given the significant association between emotional support and lower stress/anxiety related to dysmenorrhea, peer-support and family-inclusive awareness initiatives may meaningfully ease the psychosocial burden of the condition.
- Future studies should consider purposive sampling to recruit adequate comparison groups without dysmenorrhea, which would allow more stable multivariable modeling of its determinants than was possible in this near-universal-prevalence sample.

Conclusion

This study found a strikingly high, near-universal prevalence of dysmenorrhea among female university students in Lahore, with substantial impact on class concentration, academic performance, and social participation, particularly among those with more severe pain. Self-medication, most often with paracetamol guided by personal experience or traditional belief rather than professional advice, was the predominant management strategy, while formal healthcare-seeking remained low. These findings highlight an important opportunity for community pharmacists to provide brief, targeted counseling on rational analgesic use at the point of sale, and for university health services to reframe severe menstrual pain as a legitimate clinical concern deserving timely care. Future studies using purposive sampling to recruit adequate comparison groups without dysmenorrhea are needed to more reliably characterize its determinants in this population.

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Conflict of Interest

The authors declare that they have no competing interests.

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Frontier in Medical & Health Research

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Declaration of AI or ChatGPT Usage

We did not used ChatGPT or any other Ai tool.

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