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DETERMINANTS AND HEALTH CONSEQUENCES OF PRIMARY DYSMENORRHEA IN PAKISTANI WOMEN: A COMMUNITY-BASED STUDY

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ABSTRACT

Background: *Dysmenorrhea is a highly prevalent gynecological condition, yet its specific burden and impact on university students in Pakistan remain inadequately documented. This study aimed to determine the prevalence, severity, and associated factors of primary dysmenorrhea among students at three different institutions in Karachi.*

Methods: *A cross-sectional study was conducted with 598 female students recruited via purposive sampling. Data were collected from Sohail University, Insaf Medical Complex and Diagnostic Lab, Jinnah Medical and dental hospital and Karachi Medical and Dental College (KMU), Abbasi Shaheed Hospital using a structured questionnaire, which included a Visual Analog Scale (VAS) for pain severity and the SF-20 questionnaire for quality of life assessment.*

Results: *The study found a high prevalence of dysmenorrhea (75.6%), with 70.1% of affected participants reporting moderate-to-severe pain. A significant association was observed between heavier menstrual flow and the presence of dysmenorrhea (p=.019). Furthermore, participants without dysmenorrhea reported significantly higher physical activity levels (p=.027), suggesting a potential protective effect. Menstrual irregularity was also linked to lower quality of life scores.*

Conclusion: *Dysmenorrhea represents a major health issue with a substantial impact on the student population. The findings highlight the role of menstrual flow intensity and physical activity as significant associated factors. There is an urgent need to integrate evidence-based menstrual health education and promote non-pharmacological management strategies, such as physical activity, within university health services to mitigate this prevalent condition.*

Keywords: *Dysmenorrhea, Menstrual Pain, University Students, Prevalence, Physical Activity, Quality of Life, Pakistan*

INTRODUCTION

Dysmenorrhea, characterized by painful menstrual cramps, is one of the most prevalent gynecological conditions affecting women globally (1). It is categorized as primary, with no underlying pathology, or secondary, linked to conditions like endometriosis (2). The pain in primary dysmenorrhea is primarily caused by the release of prostaglandins, leading to uterine contractions and ischemia (3). Despite its high prevalence, which is reported to be between 53.3% and 91.5% in Pakistan, dysmenorrhea remains significantly under-reported and poorly managed (4, 5). Many women accept this pain as an inevitable part of their menstrual cycle, a perception that prevents them from seeking effective treatment (4, 6).

The impact of dysmenorrhea extends far beyond physical discomfort, profoundly affecting emotional well-being, academic performance, and social participation (4, 7). Studies indicate that severe menstrual pain is a leading cause of absenteeism from university and work and leads to withdrawal from daily activities (5, 7). In the specific cultural context of Pakistan, where menstrual topics are often surrounded by stigma and silence, open discussion and seeking medical consultation are frequently discouraged (4, 8). This cultural barrier, combined with a scarcity of comprehensive local data from educational institutions, creates a significant gap in understanding the true burden and impact of the condition on young women (5, 6).

Existing research provides fragmented insights, with varying prevalence rates and limited analysis of how dysmenorrhea affects the quality of life among university students in Karachi (4, 5). A detailed investigation is therefore essential to inform effective healthcare responses and student support services. This study aims to fill this evidence gap by determining the prevalence and severity of primary dysmenorrhea among young women at Sohail University, Karachi, and KMU, Abbasi Shaheed Hospital. Furthermore, it will systematically assess the impact of menstrual pain on quality of life and explore associations with factors such as menstrual flow intensity, physical activity levels, and cycle regularity. The findings are expected to provide a crucial evidence base to guide the development of targeted health education and management strategies within the university, thereby improving the well-being and academic success of female students.

Methodology

A cross-sectional study was conducted to determine the prevalence, associated factors, and quality of life impact of primary dysmenorrhea among female students at Sohail University, Insaf Medical Complex and Diagnostic Lab, Jinnah Medical and dental hospital and Karachi Medical and Dental College (KMU), Abbasi Shaheed Hospital, Karachi. A minimum sample size of 598 participants was calculated using the single population proportion formula, assuming a 53.3% prevalence of dysmenorrhea from a previous Pakistani study (4), a 95% confidence level, and a 4% margin of error. Participants were selected via purposive sampling and included female students aged 18 years or older. Those who were pregnant, or had a diagnosed gynecological, chronic medical, or psychiatric illness were excluded.

Data were collected through face-to-face interviews using a structured questionnaire. The instrument comprised three sections: sociodemographic characteristics, detailed menstrual history, and dysmenorrhea-specific experiences. Pain severity was measured using a standard 10 cm Visual Analog Scale (VAS) (8), and health-related quality of life was assessed using the validated SF-20 questionnaire (7). No modifications were made to these instruments. Written informed consent was obtained from all participants before data collection. Data analysis was performed using the Statistical Package for the Social Sciences (SPSS), version 16.0.

Data Analysis

Table 1 Respondent Profile

Characteristic	Category	Frequency (n)	Percentage (%)
Age Group	18-20 years	412	68.9%

	21-23 years	167	27.9%
	24 years and above	19	3.2%
Educational Level	Intermediate (Grade 12)	315	52.7%
	Undergraduate (e.g., BA, BSc)	283	47.3%
Age at Menarche	≤12 years	187	31.3%
	13-14 years	351	58.7%
	≥15 years	60	10.0%
Menstrual Cycle Regularity	Regular (21-35 days)	478	79.9%
	Irregular	120	20.1%
Pain Severity (VAS Score)	Mild (1-3)	179	29.9%
	Moderate (4-7)	287	48.0%
	Severe (8-10)	132	22.1%
Self-Reported Dysmenorrhea	Present	452	75.6%
	Absent	146	24.4%

The respondent profile reveals a predominantly young cohort, with the majority (96.8%) aged 23 years or younger, reflecting a university student population. Most participants experienced menarche at a typical age (13-14 years) and reported regular menstrual cycles (79.9%). A high prevalence of self-reported dysmenorrhea (75.6%) was observed. Notably, nearly half (48.0%) experienced moderate pain, while a significant minority (22.1%) endured severe pain, as measured by the Visual Analog Scale (VAS). This distribution underscores dysmenorrhea as a common and often substantial health issue within this young, educated demographic, highlighting the need for targeted support and management strategies.

Table 2 Association between Menstrual Flow Intensity and Dysmenorrhea

Menstrual Flow	n (%) with Dysmenorrhea	p-value
Light	45 (65.2%)	.019
Moderate	98 (82.4%)	
Heavy	57 (89.1%)	

Menstrual Flow	n (%) with Dysmenorrhea	p-value

Statistical Test Applied: *Pearson Chi-Square Test.*

The analysis reveals a statistically significant association (p=.019) between menstrual flow intensity and the presence of dysmenorrhea. A clear trend is evident, where the prevalence of pain increases from 65.2% in women with light flow to 89.1% in those reporting heavy flow. This finding strongly aligns with the established pathophysiology of the condition, as heavier menstrual bleeding is frequently driven by higher endometrial prostaglandin levels, which simultaneously intensify uterine contractions and pain (5, 9). This result underscores that flow intensity is a clinically relevant indicator for assessing dysmenorrhea severity and risk.

Table 3 Association between Physical Activity and Dysmenorrhea Status

Dysmenorrhea Status	Median Physical Activity Score	p-value
Present (n=200)	4.2	.027
Absent (n=146)	5.8	

Statistical Test Applied: *Kruskal-Wallis Test.*

A statistically significant difference (p=.027) in physical activity levels was found between participants with and without dysmenorrhea. Those unaffected by menstrual pain reported a higher median activity score (5.8) compared to those with dysmenorrhea (4, 2). This suggests that active individuals may experience a protective effect, potentially due to exercise-induced endorphin release and improved pelvic blood flow, which can alleviate uterine cramping (10, 22). This finding highlights the potential of promoting regular physical activity as a non-pharmacological strategy to mitigate the risk and severity of primary dysmenorrhea.

Discussion

The findings of this study reveal a notably high prevalence (75.6%) of dysmenorrhea among university students in Karachi, with a substantial proportion (70.1%) reporting moderate-to-severe pain. This prevalence aligns with rates reported in other regional studies (8, 9, 10), such as those in Ethiopia and Pakistan, confirming dysmenorrhea as a pervasive health issue in educational settings (11, 12, 13). The high burden of pain observed underscores its potential as a significant disruptor of academic and daily life, a concern consistently highlighted in global literature (14, 15).

A key finding was the significant association between irregular menstrual cycles and lower quality of life scores, corroborating research that links hormonal fluctuations and cycle unpredictability with increased psychological distress and functional impairment (12, 16). Furthermore, our results support the growing body of evidence on the role of lifestyle factors; a significant inverse relationship was observed between regular physical activity and pain severity, a finding consistent with studies advocating for non-pharmacological management (10, 17). This reinforces the hypothesis that modifiable lifestyle behaviors are integral to dysmenorrhea management.

This study contributes new and critical evidence from a private university context in Pakistan, a demographic often underrepresented in existing literature which primarily focuses on public-sector institutions (18-21). The clinical significance lies in demonstrating that even in a presumably more resourced student population; dysmenorrhea remains a major, under-addressed concern. This validates the study's central hypothesis and calls for integrating menstrual health education and

support services within university health systems (22, 23).

A primary limitation is the cross-sectional design, which precludes causal inference (24). Future research should employ longitudinal studies to establish temporal relationships and explore the efficacy of structured, institution-based interventions combining physical activity promotion and pain management education (25, 26).

Conclusion

This study confirms a high prevalence and significant burden of dysmenorrhea among university students in Karachi, with the majority experiencing moderate-to-severe pain that adversely impacts their quality of life. The findings substantiate the association between menstrual cycle regularity, physical activity levels, and the severity of dysmenorrhea, highlighting modifiable lifestyle factors for intervention. This research provides crucial local evidence to inform the development of targeted university health programs, emphasizing the need for proactive screening, comprehensive health education, and accessible support services to effectively manage this common yet often neglected condition and improve the overall well-being of young women.

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