ORIGINAL ARTICLE

Estimating the Impact of Associated Factors on Women's Absenteeism from School or Work due to Inadequate Menstrual Hygiene Management

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Abstract

Background: Menstrual hygiene management (MHM) is a critical public health issue that significantly affects women's health, education, and overall well-being. Globally, inadequate MHM has been linked to increased absenteeism from school and work, impacting women's participation in social and economic activities.

Objective: This study aims to investigate the factors associated with women's absenteeism from social activities, school, or work due to inadequate MHM.

Methods: This study is a secondary data research analysis based on the Pakistan MICS data collected in 2018-2019. The MICS survey used in this study was conducted from 2018 to 2019 and included cross-sectional demographic, socioeconomic, and health indicators. The secondary data analysis included only women of reproductive age (15-49 years). The data were available for 26,481 participants for MHM practices.

Results: The average age of participants was 28.3 ± 5.6 years. A total of 42.8% of women were absent from social activities, school, or work due to menstruation. The absenteeism showed a significant increase in rural areas (aOR=1.09, 95% CI: 1.02-1.16, p=0.013) while the younger women aged 15-24 years had a corresponding (aOR: 1.23, 95% CI: 1.07-1.40), (aOR: 1.34, 95% CI: 1.18-1.52). Women with higher wealth status had fewer cases of absenteeism, especially those in the richest wealth quintile aOR: 0.23, 95% CI: 0.21-0.27). Poor sanitation was found to be associated with higher absenteeism (aOR: 1.36, 95% CI: 1.20-1.54), and lack of access to proper means of washing and changing in private also resulted in increased absenteeism (aOR: 4.29, 95% CI: 3.96-4.65). Marital status, as well as functional difficulties, produced a lesser percentage of change.

Conclusion: The findings of this study highlight the imperative need to address the barrier to adequate menstrual hygiene practices. Thus, the study implies that the accessibility of sanitary products and supportive social environments should be considered steps to reduce absenteeism due to menstruation.

Keywords: *Menstrual hygiene management, absenteeism, multiple indicator cluster survey, sanitary pads, social activities, sociocultural stigma.*

INTRODUCTION

Menstrual hygiene management (MHM) is a critical public health issue that significantly affects women's health, education, and overall well-being. Globally, inadequate MHM has been linked to increased absenteeism from school and work, impacting women's participation in social and economic activities [1, 2]. Menstrual Hygiene Management (MHM) refers to access to clean menstrual products, facilities to change them in privacy, and adequate water and sanitation for managing menstruation with dignity and safety [3].

The World Health Organization emphasizes that proper menstrual hygiene is essential for the health and dignity of women and girls. However, many women, especially in low- and middle-income countries, face numerous barriers to adequate Menstrual hygiene management, including limited access to sanitary products, inadequate sanitation facilities, and sociocultural stigma [4, 5].

In Pakistan, the situation is particularly concerning. Studies indicate that a significant number of women lack access to basic sanitation and menstrual hygiene products, leading to increased school absenteeism among adolescent girls [5]. Research has shown that girls in rural areas are disproportionately affected, with higher rates of absenteeism compared to their urban counterparts [6]. Furthermore, cultural taboos surrounding menstruation often exacerbate the challenges faced by women, further limiting their ability to manage menstruation with dignity [6].

National-level, quantitative studies on the determinants of absenteeism related to MHM remain scarce in Pakistan. This study addresses this gap by analyzing data from the MICS 2018-19 survey to explore factors associated with menstruation-related absenteeism.

Given the profound implications of menstrual hygiene management on women's health and socioeconomic status, this study aims to investigate the factors associated with women's absenteeism from social activities, school, or work due to inadequate MHM in Pakistan. By understanding these associations, the research seeks to inform policy interventions aimed at

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improving menstrual hygiene practices and promoting gender equity in educational and professional settings.

METHODS

This study is a secondary data analysis based on the Sindh Multiple Indicator Cluster Survey (MICS) 2018-19, conducted by the Government of Sindh in collaboration with UNICEF. The MICS is a cross-sectional, population-based household survey designed to provide internationally comparable and statistically robust indicators related to the health, education, and well-being of women and children. In Pakistan, MICS surveys are conducted at the provincial level. The Sindh MICS 2018-19 encompassed all 29 districts of the province and was published in February 2021. The sampling frame, developed by the Pakistan Bureau of Statistics (PBS), resulted in a sample of 20,540 households. The MICS dataset, along with the relevant survey instruments and reports, is publicly available on the official websites of UNICEF and the Government of Sindh [7].

For this study, we included women of reproductive age (15-49 years) with complete responses on menstrual hygiene management (MHM) indicators. The final sample comprised 26,481 women who provided information on MHM practices and absenteeism due to menstruation. Respondents were included if they answered relevant questions regarding MHM and absenteeism from school, work, or social activities.

Independent variables were selected based on theoretical relevance and previous literature identifying key social, economic, and environmental determinants of menstrual hygiene and absenteeism. Participants with incomplete or missing data on key variables were excluded from the analysis. Missing data were handled using listwise deletion to maintain consistency across variables.

The primary outcome variable was absenteeism, defined as self-reported absence from school, work, or social activities due to poor menstrual hygiene practices. Independent variables included demographic characteristics (age, area of residence, marital status, and education level), socioeconomic status (measured through household wealth quintiles), sanitation facilities (categorized as improved, unimproved, or open defecation), MHM practices (type of menstrual products used and availability of privacy for washing or changing), and presence of functional difficulties. Inadequate MHM was operationalized as the lack of access to menstrual products such as sanitary pads, tampons, or reusable cloths, insufficient privacy or facilities to maintain hygiene during menstruation, or reliance on suboptimal sanitation practices such as unimproved latrines or open defecation.

Descriptive statistics were used to summarize the characteristics of the sample. Pearson's chi-square test was employed for bivariate analysis to assess associations between individual characteristics and absenteeism. Multivariate logistic regression was conducted because the outcome variable absenteeism is binary, allowing for the estimation of adjusted odds ratios while controlling for confounding variables. Crude odds ratios (COR) and adjusted odds ratios (aOR), along with 95% confidence intervals, were calculated. The model's goodness-of-fit was assessed using the likelihood ratio chi-square test and pseudo-R-squared values.

RESULTS

The average age of participants was 28.3 ± 5.6 years. The 42.8% of women were absent from social activities, school, or work due to menstruation The selected women participants' demographics are summarized in Table **1** below. They indicate the percentage distribution of each characteristic or attribute including demographic and socio-economic details; besides the frequency.

A bivariate analysis of the characteristics of the women and the absenteeism from social activities, school, or

Table 1: Women participants' characteristics.

Characteristics	Frequency	Percentage
Area of Residence		
Urban	13,773	52.0
Rural	12,708	48.0
Age in years		
15-19	5,863	22.1
20-24	4,844	18.3
25-29	4,554	17.2
30-34	4,096	15.5
35-39	3,376	12.8
40-44	2,240	8.4
45-49	1,508	5.7
Wealth Quintiles		
Poorest	4,971	18.8
Second	5,348	20.2
Middle	5,780	21.8
Fourth	5,327	20.1
Richest	5,055	19.1
Educational Status		
Pre-primary or none	14,409	54.4
Primary	3,225	12.2
Middle	1,794	6.8
Secondary	3,019	11.4
Higher	4,034	15.2
Marital Status		
Currently Married	17,070	64.5
Formerly Married	612	2.3
Never Married	8,799	33.2
Sanitation		
Improved	19,127	72.2
Unimproved	1,325	5.0
Open Defecation	6,029	22.8
Women can wash and change in privacy while at home during last menstruation		
Yes	22,092	83.4

Characteristics	Frequency	Percentage
No	4,389	16.6
Sanitary pads, tampons, or cloth are used during the last menstruation		
Yes	21,473	81.1
No	5,008	18.9
Absent from social activities, school, or work due to last menstruation		
Yes	11,334	42.8
No	15,147	57.2

work due to inadequate MHM is illustrated in Table **2** absenteeism due to inadequate MHM was significantly associated with rural residence, younger age (15-24 years), lower wealth quintiles, and lower education (p<0.001). Women with unimproved sanitation, lack of privacy for washing/changing, and those not using sanitary products were significantly associated (p<0.001).

Table 2: Bivariate analysis of, the association between women's characteristics and women's absenteeism from social activities, school, or work due to MHM.

Variable	Women Absenteeism Due to Lack of MHM		
	Yes n (%)	No n (%)	p-value
Area of Residence			
Urban	5,058 (36.72)	8,715 (63.28)	<0.001
Rural	6,276 (49.39)	6,432 (50.61)	
Age in years			
15-19	2,581 (44.04)	3,282 (56.96)	<0.001
20-24	2,203 (45.50)	2,641 (54.50)	
25-29	1,973 (43.35)	2,581 (56.65)	
30-34	1,770 (43.21)	2,326 (56.79)	
35-39	1,358 (40.20)	2,018 (59.80)	
40-44	853 (38.08)	1,387 (61.92)	
45-49	594 (39.39)	914 (60.61)	
Wealth Quintiles			
Poorest	2,387 (48.02)	2,584 (51.98)	<0.001
Second	2,862 (53.50)	2,486 (46.50)	
Middle	2,944 (50.93)	2,836 (49.07)	
Fourth	1,911 (35.89)	3,416 (64.11)	
Richest	1,230 (24.33)	3,825 (75.67)	
Educational Status			
Pre-primary or none	6,724 (46.70)	7,685 (53.30)	<0.001
Primary	1,495 (46.39)	1,730 (53.61)	
Middle	694 (38.68)	1,100 (61.32)	
Secondary	983 (32.56)	2,036 (67.44)	
Higher	1,432 (35.50)	2,602 (64.50)	
Marital Status			
Currently Married	7,421 (43.48)	9,649 (56.52)	<0.001
Formerly Married	220 (35.95)	392 (64.05)	
Never Married	3,693 (41.96)	5,106 (58.04)	
Sanitation			
Improved	7,721 (40.38)	11,406 (59.62)	<0.001
Unimproved	791 (59.70)	534 (40.30)	
Open Defecation	2,822 (46.76)	3,207 (53.24)	
Privacy to Wash/Change			
Yes	10,452 (47.27)	11,640 (52.73)	<0.001
No	892 (20.30)	3,497 (79.70)	
Use of Pads/Tampons/Cloth			
Yes	9,466 (44.07)	12,007 (55.93)	<0.001
No	1,868 (37.34)	3,140 (62.66)	

Table **3** presents the Crude Odds Ratios (COR) for factors associated with absenteeism due to inadequate menstrual hygiene management (MHM). Women residing in rural areas had significantly higher odds of absenteeism due to inadequate MHM compared to those in urban areas (COR: 1.68, 95% CI: 1.60-1.77). Younger women were more likely to experience absenteeism, with significantly higher odds observed among those aged 15-19 years (COR: 1.21, 95% CI: 1.08-1.36), 20-24 years (COR: 1.28, 95% CI: 1.14-1.44), 25-29 years (COR: 1.18, 95% CI: 1.05-1.33). Wealth status was also significantly associated with absenteeism. Women from the second (COR: 1.25, 95% CI: 1.15-1.35) and middle (COR: 1.12, 95% CI: 1.04-1.21) quintiles had increased odds of absenteeism compared to the poorest. In contrast, women from the fourth (COR: 0.60, 95% CI: 0.56-0.66) and richest (COR: 0.35, 95% CI: 0.32-0.38) quintiles had significantly lower odds of absenteeism.

Women using unimproved sanitation facilities had greater odds of absenteeism than those with improved sanitation

Table 3: Logistic regression model factors associated with women's absenteeism due to inadequate MHM.

Area of Residence	COR (95% CI)	p-value	aOR (95% CI)	p-value
Urban	Reference Category		Reference Category	
Rural	1.68 (1.60-1.77)	*<0.001	1.09 (1.02-1.16)	*0.013
Age in years				
15-19	1.21 (1.08-1.36)	*0.001	1.23 (1.07-1.40)	*0.004
20-24	1.28 (1.14-1.44)	*<0.001	1.34 (1.18-1.52)	*<0.001
25-29	1.18 (1.05-1.33)	*0.007	1.21 (1.07-1.38)	*0.003
30-34	1.17 (1.04-1.32)	*0.001	1.17 (1.03-1.33)	*0.017
35-39	1.03 (0.91-1.17)	0.595	1.02 (0.89-1.16)	0.757
40-44	0.94 (0.83-1.08)	0.419	0.96 (0.84-1.11)	0.647
45-49	Reference category		Reference category	
Wealth Quintiles				
Poorest	Reference category		Reference category	
Second	1.25 (1.15-1.35)	*<0.001	0.95 (0.86-1.04)	0.261
Middle	1.12 (1.04-1.21)	*0.002	0.79 (0.70-0.88)	*<0.001
Fourth	0.60 (0.56-0.66)	*<0.001	0.42 (0.37-0.48)	*<0.001
Richest	0.35 (0.32-0.38)	*<0.001	0.23 (0.21-0.27)	*<0.001
Marital Status				
Currently Married	Reference category		Reference category	
Formerly Married	0.73 (0.62-0.86)	*<0.001	0.75 (0.62-0.89)	*0.001
Never Married	0.94 (0.89-0.99)	*0.019	0.94 (0.88-1.01)	*0.115

Area of Residence	COR (95% CI)	p-value	aOR (95% CI)	p-value
Sanitation				
Improved	Reference category		Reference category	
Unimproved	2.18 (1.95-2.45)	*<0.001	1.36 (1.20-1.54)	*<0.001
Open Defecation	1.29 (1.22-1.37)	*<0.001	0.80 (0.72-0.88)	*<0.001
Women are able to wash and change in privacy while at home during the last Menstruation				
Yes	Reference category		Reference category	
No	3.52 (3.25-3.81)	*<0.001	4.29 (3.96-4.65)	*<0.001
Sanitary pads, tampons, or cloth are used during the last Menstruation ~				
Yes	Reference category			
No	1.32 (1.24-1.41)	*<0.001	1.36 (1.20-1.54)	*<0.001
Model's Diagnostics				
Number of Observations: 26,481			P-value (LR-Chi Sqr)<0.0001	
LR (df=16): 2949.78			Pseudo R-sqr: 0.0816	

CI=Confidence Interval; COR=Crude Odds Ratio; aOR=Adjusted Odds Ratio
*p-value<0.05
~variable excluded from the regression model after different iterations

(COR: 2.18, 95% CI: 1.95-2.45). Lack of privacy for washing and changing during menstruation was strongly associated with absenteeism, with women who lacked privacy having significantly higher odds of absenteeism (COR: 3.52, 95% CI: 3.25-3.81). Additionally, women who did not use sanitary pads, tampons, or cloth had significantly increased odds of absenteeism (COR: 1.32, 95% CI: 1.24-1.41).

After adjusting for covariates, significant associations remained for several variables. Women in rural areas had higher odds of absenteeism (aOR: 1.09, 95% CI: 1.02-1.16) than urban women. Younger women aged 15-19 years (aOR: 1.23, 95% CI: 1.07-1.40), 20-24 years (aOR: 1.34, 95% CI: 1.18-1.52), 25-29 years (aOR: 1.21, 95% CI: 1.07-1.38), and 30-34 years (aOR: 1.17, 95% CI: 1.03-1.33) had significantly higher odds of absenteeism than women aged 45-49 years. Wealth quintiles were also associated with absenteeism, with significantly lower odds among the richest (aOR: 0.23, 95% CI: 0.21-0.27), fourth (aOR: 0.42, 95% CI: 0.37-0.48), and middle-class (aOR: 0.79, 95% CI: 0.70-0.88) compared to the poorest. Sanitation was significantly linked to absenteeism, with higher odds among women using unimproved facilities (aOR: 1.36, 95% CI: 1.20-1.54) compared to those with improved sanitation. The absence of privacy during menstruation remained strongly associated with absenteeism, with women who lacked privacy having significantly higher odds (aOR: 4.29, 95% CI: 3.96-4.65) of being absent.

DISCUSSION

The prevalence of absenteeism due to menstruation varies significantly across contexts. In this study, 42.8% of women reported absenteeism, which is notably higher than in other regions. For instance, rural northern Ghana reported 27.5% of adolescent girls aged 15-19 years missing school due to menstruation [7], and a multicounty analysis of MICS data from 44 low- and middle-income countries (2017-2023) found a pooled prevalence of 15%, with South Asia reporting the highest at 19.7% [8]. Nepal recorded 22.1% [9], while Tanzania noted geographic disparities as key determinants, with about 30% of girls missing school [10].

This suggests that place of residence, particularly in rural settings, remains a powerful determinant of menstrual hygiene management (MHM) outcomes. Poor access to sanitary products, inadequate sanitation facilities, and lack of privacy contribute to absenteeism. Geographic isolation limits product availability, and even when available, affordability may remain a barrier. In Pakistan, menstrual products such as sanitary pads are generally available in urban markets; however, rural distribution is limited and sporadic. A recent report by UNICEF (2023) highlighted that around 50% of adolescent girls in rural Pakistan lack access to commercial menstrual products. Moreover, market prices are prohibitively high for low-income families, often costing 200-400 PKR per pack, which is unaffordable for many. As of May 2025, 1 USD equals approximately 278 PKR, making a standard pack of pads cost around USD 0.72-1.44. The average rural household income in Pakistan is estimated to be under PKR 25,000 per month (USD ~90), rendering such products inaccessible to many [11]. Surveys assessing affordability in Pakistan are limited, but economic constraints are commonly cited as a barrier in qualitative studies.

The findings also revealed that younger women (15-24 years) had significantly higher odds of absenteeism (aOR 1.17-1.33), consistent with prior African studies where younger women were more likely to miss work or school due to menstruation (OR 1.28, 95% CI 0.85-1.92) [12]. This could be attributed to a lack of knowledge about menstruation, inexperience in self-care practices, and heightened embarrassment or stigma. Cultural taboos in Pakistan also play a major role, where menstruation is still considered a 'hidden' or shameful topic. In many conservative communities, young girls are discouraged from discussing menstruation, which hinders education and open dialogue, contributing to poor hygiene practices and absenteeism.

A strong inverse relationship between wealth and absenteeism was found, where women in the richest quintile had significantly reduced odds of absenteeism (aOR = 0.22). This highlights how socioeconomic status (SES) mitigates MHM-related challenges. Wealthier individuals are better able to purchase sanitary products, access clean and private facilities, and overcome cultural barriers. A systematic review of university students in LMICs showed that higher SES was associated with reduced absenteeism due to improved access to MHM resources [13, 14].

Not using menstrual products such as sanitary pads or tampons was associated with a 1.33 times greater likelihood of absenteeism. This finding supports previous literature that links product use with school and work attendance [13]. Affordability and accessibility again play critical roles. While products may be available, they are not always financially accessible. Therefore, "improved access" must go beyond physical availability—it must include affordability, awareness, and cultural acceptability. Without subsidized programs or government support, mere market availability does not equate to real access.

Sanitation conditions also had a significant association with absenteeism. Women using unimproved sanitation facilities had a higher likelihood of absenteeism. This is particularly concerning for self-employed and daily wage earners who lack formal toilet access. Studies globally support that poor sanitation leads to chronic health problems and psychological distress, reinforcing the need for adequate menstrual-friendly facilities [15]. Privacy was another critical factor—women who lacked private places to wash and change reported higher absenteeism, emphasizing the importance of dignity in menstruation [16, 17].

Cultural opposition from local elders and religious groups has been documented in parts of Pakistan. Some conservative communities discourage the use of commercial menstrual products, viewing them as "unnatural" or promoting immorality. Religious and social taboos further prevent women from purchasing or using such products freely. Recent movements, such as the "Mahwari Justice" campaign, and organizations like Aahung and Greenstar Social Marketing, have actively worked to challenge these taboos and raise awareness on menstrual health [18, 19]. This socio-cultural resistance hinders the impact of interventions unless community buy-in and sensitization are ensured. The Ministry of Health has recently included menstrual hygiene as part of its broader sexual and reproductive health framework, with efforts being led under initiatives like the Sehat Sahulat Program in some provinces [20].

Regarding regional comparisons, one referenced study from Africa must be contextualized more specifically. The cited research was conducted in Uganda, which, while facing similar resource constraints, has distinct cultural and governmental approaches to MHM. Unlike Pakistan, Uganda has piloted school-based pad distribution programs with community engagement, which may explain differences in absenteeism rates. However, both countries share issues of affordability, stigma, and infrastructure gaps [21].

It is important to note that menstrual-related absenteeism is not solely due to product shortages. A deeper understanding of hygiene knowledge, cultural beliefs, gender norms, and health literacy is essential. Interventions should thus adopt a comprehensive approach combining education, subsidies, infrastructure development, and community mobilization.

STRENGTHS OF THE STUDY

This study's strengths lie in its use of nationally representative MICS data from over 26,000 women, providing robust insights into the relationship between MHM practices and absenteeism. The multivariate approach allows for the identification of independent associations while accounting for key sociodemographic variables. Moreover, the focus on adolescent and rural women highlights under-researched populations most at risk of poor MHM outcomes.

LIMITATIONS

This study is based on secondary analysis using MICS data and thus lacks in-depth contextual and qualitative information. Its cross-sectional nature prevents causal inferences. Self-reported outcomes may be prone to recall or social desirability bias. Additionally, national-level data on menstrual product affordability and cultural barriers remain scarce in Pakistan. Future research should incorporate longitudinal and qualitative designs to better understand contextual nuances.

CONCLUSION

This study highlights the urgent need to improve menstrual hygiene practices in Pakistan, particularly among adolescent girls and women in rural areas. Enhancing access to affordable sanitary products, improving the quality and availability of sanitation facilities, and fostering supportive environments through schools, families, workplaces, and community leaders are critical steps to reduce menstruation-related absenteeism. Policymakers and public health practitioners must prioritize integrated, multi-sectoral interventions to ensure sustainable improvements in menstrual health and educational and occupational participation for women.

The study's findings offer direct policy implications: integrating menstrual hygiene into national and provincial health policies, expanding school- and community-based distribution of sanitary products, and including menstrual health education in school curricula. Subsidizing menstrual products for low-income households and ensuring menstrual-friendly infrastructure in public institutions should be a government priority. Collaborations between health, education, and gender ministries can support the development of sustainable, equity-focused programs addressing both product accessibility and social stigma.

LIST OF ABBREVIATIONS

WHO: World Health Organization
MHM: Menstrual Hygiene Management
MICS: Multiple Indicator Cluster Survey

ETHICS APPROVAL

De-identified secondary data were employed for this research since they are obtained from the public and open-access sources. Thus, it shall not be a violation of confidentiality at virtually any time. The data collection was done using a register-based sampling technique after registration in the MICS.

CONSENT FOR PUBLICATION

Not applicable.

AVAILABILITY OF DATA

The data is available online at MICS 2018-2019.

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None.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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AUTHORS' CONTRIBUTION

Sameera Ali Rizvi: Conceptualized the study idea.

Muhammad Kazim Jafri: Provided data and conducted initial analysis.

Syeda Tabeena Ali: Performed full data analysis.

Nida Shoaib: Proofread the manuscript.

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