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Investigating the impact of menstrual health on female productivity at work: Evidence from Malaysia

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Abstract

This study investigates the impact of menstrual symptoms (MS) on workplace productivity among 384 women in the IT, healthcare and education sectors. Women provided data on menstrual flow, irregularity, pain, tiredness, concentration trouble and rated their performance on a 1-5 scale. Findings suggest that 52.9% of participants had decreased job performance during menstruation (≈ 53% lower score) while 87.8% had regular cycles and 60.7% experienced normal flow. Exploratory Factor Analysis indicated a stronger association between MS and reduced productivity than with absenteeism (Kaiser-Meyer-Olkin or KMO = 0.60 for shared variable structure per standard thresholds; Bartlett's $\chi^2 = 3516.13$, $p<.001$ implying <0.1% chance of an identity correlation matrix). Moderate strength was noticed between concentration issues and menstrual cycle characteristics (Cramer's V≈ 0.32, $p<.001$). The study highlights the urgent need for workplace policies that address menstrual health, including flexible arrangements and improved hygiene support, to enhance employee well-being and efficiency. *(Afr J Reprod Health 2025; 29 [12]: 76-86).*

Keywords: Absenteeism; Job performance; Menstrual health; Menstrual symptoms; Work productivity

Résumé

Cette étude examine l'impact des symptômes menstruels (SM) sur la productivité au travail chez 384 femmes issues des secteurs des technologies de l'information, de la santé et de l'éducation. Les participantes ont fourni des données sur le flux menstruel, l'irrégularité, la douleur, la fatigue, les troubles de concentration et ont évalué leur performance sur une échelle de 1 à 5. Les résultats indiquent que 52,9 % des participantes ont constaté une baisse de performance professionnelle pendant les menstruations (≈ 53 % de score inférieur), tandis que 87,8 % avaient des cycles réguliers et 60,7 % un flux normal. L'analyse factorielle exploratoire a montré une association plus forte entre les SM et la baisse de productivité qu'avec l'absentéisme (Kaiser-Meyer-Olkin ou KMO = 0,60 pour la structure des variables partagées selon les seuils standards ; χ^2 de Bartlett = 3516,13, $p<.001$, suggérant une probabilité <0,1 % d'une matrice de corrélation identité). Une corrélation modérée a été observée entre les problèmes de concentration et les caractéristiques du cycle menstruel (V de Cramer ≈0,32, $p<.001$). L'étude souligne l'urgence de mettre en place des politiques professionnelles prenant en compte la santé menstruelle, incluant des modalités de travail flexibles et un meilleur soutien en matière d'hygiène, afin d'améliorer le bien-être et l'efficacité des employees. *(Afr J Reprod Health 2025; 29 [12]: 76-86).*

Mots-clés: Absentéisme; Performance au travail; Santé menstruelle; Symptômes menstruels; Productivité professionnelle

Introduction

More than 300 million females menstruate every day.[1] Menstruation, or the periodic release of blood from the uterus, occurs approximately every month during a woman's reproductive stage. Some women experience anxiety, which can occasionally cause disruptions in their lives.[2-3] In one way or another, 40–95% of women who menstruate experience menstrual discomfort and problems. Furthermore, certain cultures have conducted research that have identified menstruation symptoms as one of the reasons why women frequently miss work, school, sporting events and other public gatherings.[3-5] There is increased recognition of the natural process of being negative in experience that may cause a barrier to health and gender equality contexts.[5] Many qualitative studies have highlighted this issue.[6] Earlier, studies have focused on the menstrual experiences of girls filled with discomfort and fear in their teens.[7] The core challenges include supportive sanitation infrastructure, availability of sanitary items for absorbing menstruation and practical and biological

knowledge regarding menstruation.[8] These challenges have also negatively impacted participation in school and well-being.[9-10] The lack of resources and support was also emphasized by adult women with contribution to stress and increased absenteeism in the workplace.[11-12]

Menstrual health symptoms are often cited in the literature but medically fall under three syndromes likely dysmenorrhea, premenstrual syndrome (PMS) and premenstrual dysphoric disorder (PMDD). Dysmenorrhea includes cramp like pelvic pain, affecting about 50 to 90% of menstruating females and severe disruption in activities noticed in up to 15% of women. Rising female workforce participation marks the economic relevance of menstrual health in accordance with productivity losses from menstrual symptoms costing the Australian economy an estimated $9.53 billion Int annually. Despite this burden, workplace accommodations remain limited, underscoring systemic neglect of gendered health needs.[13] Additionally, PMS affecting over 90% of women, includes bloating, breast tenderness, fatigue, headache, anxiety and irritability. More than 20% have functional impairment during menses.[14] Besides, PMDD is a recognized mood disorder that impairs work and social functioning, affecting 3 to 8% of women.[15]

Sector driven data intimates about the occupational standards of menstruating women. Severe PMS is seen among Iranian nurses who experience high cognitive-emotional-physical distress with a significant decline in performance scores, associated with emotional strain and shift work contexts.[16] In a cohort study targeting Indian working teachers, almost 50% had moderate to severe PMS or PMDD and 35% reported lower quality of life with detrimental effects on job satisfaction and overall well-being.[17] While dedicated studies focusing solely on IT professionals remain scarce, a notable gap in current research; broader international evidence reveals that nearly 80% of women employed in tertiary sectors report experiencing reduced focus and efficiency during their menstrual cycles. This suggests that many women, including those in high-pressure tech environments may be silently coping with productivity challenges that remain largely unaddressed in industry-specific research.[18]

Menstrual symptoms (MS) and its associated problems have significant implications.[19] Menstrual problems might negatively impact an individual's economic standards at work, in addition to their negative consequences for their private life.[20,21] PMS has been associated with higher absence rates and lower job productivity. [22] In general, dysmenorrhea, which exacerbates emotional and physical discomfort, is a significant contributor to absenteeism.

Literature review

It has been reported that 20% to 40% of menopausal women suffer from vasomotor symptoms that negatively impact QoL, such as hot flashes, night sweats, and personal and work life negatively.[23] A review of pre-existing worldwide evidence revealed major challenges to women in the management of menstruation in the workplaces.[24] Additionally, menstruation has been confirmed to have a detrimental impact on self-esteem, confidence, income, and productivity.[25] Menstruation presents major challenges for women in a variety of industries, with conditions getting worse in some jobs such as construction and housework.[26] Compared to informal environments, such as marketplaces, conditions in formal workplaces might be better.[27] Sanitation issues, including dirty, shared restrooms, and restricted access to water, are among the major obstacles that women working in factories or offices encounter in maintaining proper menstrual health (MH).[28] On observing such evidence-based research, a thorough epidemiological study is needed to estimate the distribution and identification of MH symptoms and their association with work productivity. Therefore, the goal of this study is to assess how MH symptoms, especially pain and fatigue, affect productivity at work and to pinpoint the major variables affecting this relationship to guide the creation of sensible workplace MH management strategies and policies.

Severe PMS/PMDD has significant repercussions on relationships and lower QoL because of psychological and physical strain.[29-31] It is essential to comprehend how these menstrual experiences are socially positioned and handled in the workplace to thoroughly examine them.[32]

Despite growing interest in workplace wellness, research on menstrual management is still mostly concentrated in non-workplace settings.[33] This study examined societal perceptions of menstruation as a sign of impurity and the consequent restriction of women's and girls' access to public areas.[34] Previous studies also suggest that menstrual syndromes not only affect their physical and emotional counterparts, but also their interpersonal relationships, daily routines, and work productivity. [35] Symptom severity strongly correlates with deficits in social and professional performance.[36]

Menstrual symptoms and work productivity

A woman's capacity to perform in a variety of contexts, such as family, workplace, and school, is usually hampered by severe premenstrual symptoms. According to estimates, severe PMS can last up to 2,800 days (more than seven years) during the reproductive years of a woman. Concrete implications include increased direct medical and associated expenditures and indirect costs associated with absenteeism, low income, as well as low productivity.

H01: Menstrual symptoms do not significantly reduce women's productivity at the workplace

Menstrual symptoms and absenteeism

Additionally, premenstrual and menstrual syndromes counters both direct costs, including medical care, and indirect costs resulting from absenteeism, income loss, productivity loss and reduced work-related quality of life. In addition, these costs may be misconstrued because of societal taboos of menstruation. Excessive indirect costs include decreased QoL as a reason for physical and psychological difficulties, along with their impacts on interpersonal relationships. [37] A study involving 32,748 women was conducted, where 13.8 percent of women reported absenteeism through menstruation and 3.4% were absent monthly. Among those who reported absence in their workplace, only 20.1% reported menstrual problems as their reason for sickness.[38] Although menstruation is common, it is frequently viewed as disdain.[39]

H02: There is no significant association between the severity of menstrual symptoms and absenteeism among working women

Objectives

The study comprises of two main objectives. Firstly, it investigates the impact of menstrual symptoms such as pain, fatigue and mood changes on women's productivity in the workplace. Secondly, it aims to evaluate the relationship between these symptoms and absenteeism by providing a clearer picture of the management of menstruation in workplace settings.

To re-state the hypotheses in a simpler context

H1: Menstrual symptoms significantly reduce women's productivity at the workplace

H2: There is a positive correlation between the severity of menstrual symptoms and absenteeism among working women.

Methods

The current research is conducted on a quantitative, cross-sectional research pattern to analyze the correlation between the severity of MH symptoms and productivity at the workplace. The study deployed a Menstrual Health and Workplace Productivity Questionnaire (MH-WPQ), a self-administered instrument that was adopted from menstrual distress protocols and productivity-at-work scales. MH-WPQ yields a Cronbach's α of 0.88, indicating acceptable internal consistency ($\alpha>0.70$). The target population were menstruating women who have had at least 3 consecutive menstrual cycles in the last six 6 months. Data were collected from 502 women aged between 18 and 45 years. Of 502 participants, 384 met the inclusion criteria and completed the questionnaire. Descriptive statistics and factor analysis were performed using IBM SPSS, Version 21. The Kaiser-Meyer-Olkin (KMO = 0.76) and Bartlett's test ($p < .001$) substantiated sampling adequacy. Exploratory factor analysis and chi-square tests were used to assess the relationships between menstrual symptoms and productivity. Throughout the research procedure, ethical guidelines were strictly followed for the protection of participants'

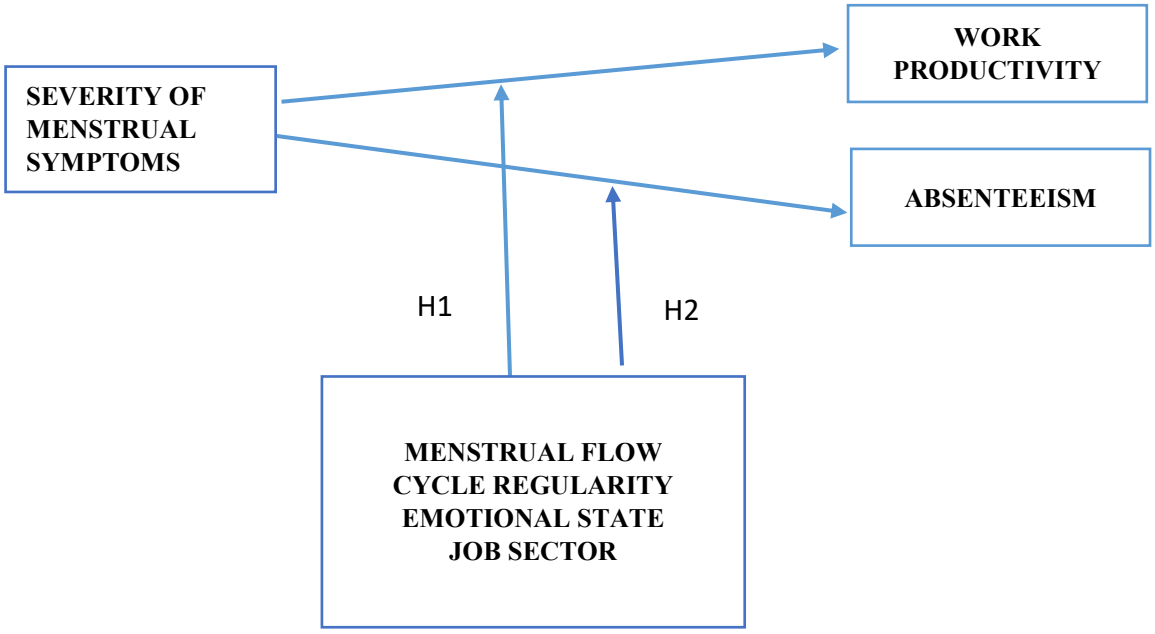

Figure 1: Conceptual framework

privacy and personal identities. Ethical approval for this study was granted by the Research and Innovation Committee, Lincoln University College, Malaysia in 2024. As the committee does not issue formal approval numbers, no reference code is available. Informed consent was obtained from all participants.

The inclusion criteria were non-pregnant women without a history of hysterectomy or ovariectomy, endocrine disorders or diseases such as Asherman's syndrome. Participants who had not yet provided consent, those who were critically ill other than a pregnant and lactating mother, or who had not yet reached the menarche period were also excluded from the study. Stratified random sampling was applied to ensure the heterogeneity and diversity of the population. However, recruitment via public advertisements and referral channels might have caused self-selection bias as women with menstrual symptoms might have been motivated to participate. After explaining the purpose of the study, 384 selected women were requested to complete the questionnaire. The Menstrual Health and Workplace Productivity Questionnaire has gathered detailed data at the intersection of MH with one of the potential sources of productivity and well-being.[27]

Demographics included age, occupation, industry or sector, years of experience, educational level, geographic location, and marital status. The MH profile includes information such as age at menarche, regularity, length of the menstrual cycle, menstrual flow and heaviness, duration, recent and future menstrual dates, and typical symptoms such as cramps or exhaustion. Participants were also queried regarding the conditions of their menstrual cycles and the use of birth control for the past three months. Questions regarding the nature of work, provision of menstrual hygiene products, restroom facilities, and workplace support were also measured. The questionnaire also asked for opinions regarding the psychological and emotional status, stress-related conditions, and mental health at work. Participants were recruited through public advertisements and workplace referrals. Statistical estimation has been carried out utilizing IBM Statistical Package for Social Sciences.

Descriptive statistics were employed to describe the demographic and occupational data. Factor analysis was carried out to discern underlying patterns in the data and to examine the correlation between MS and productivity at work. The Kaiser Meyer Olkin (KMO) of 0.76 measure reveals factor analysis suitability. "Bartlett's Test of Sphericity" of $p<.001$was significant, affirming that the factor investigation was suitable for the data. EFA results were significantly confirmed with fit indices matching accepted thresholds

(RMSEA<0.08; CFI>=0.90). Self-reported metrics were used to gauge productivity. Participants evaluated their average work performance during their periods over the last three months. A 5-point rating system was employed where 1 denoted "no work capacity" and 5 denoted "peak performance". Although objective productivity data or supervisor evaluations were considered, these were ultimately not feasible due to inconsistent performance metrics across job types and the importance of protecting participant anonymity. While self-reported data may be influenced by recall or social desirability bias, it remains the most practical and widely accepted approach in large-scale and cross-sector research on workplace productivity.[40] Ethical standards were maintained throughout the research, ensuring willingness to participate and anonymity of answers. The results offer useful insights into the association between menstruation and job performance and the necessity of policies in the workplace that are conducive to MH-related issues.

Ethical consideration

Informed consent was obtained from all individual participants included in the study prior to their inclusion in the study. Participants were assured of confidentiality and their right to withdraw at any stage without any repercussions.

Ethical approval for this study was obtained from the Research and Innovation Committee, Lincoln University College, Malaysia, in 2024. The committee does not issue formal approval numbers; therefore, no reference code is available. Informed consent was obtained from all participants prior to their inclusion in the study and participants were assured of confidentiality and their right to withdraw at any stage without consequence. The study adhered to institutional guidelines and international ethical standards for research involving human participants.

Results

The findings provide insight into the demographic, occupational and menstrual health (MH) profiles of 384 respondents. Of the 502 women that were initially recruited, 118 were excluded from the final analysis. 26 of them declined to provide consent, 34 did not meet the inclusion criteria and 58 submitted incomplete questionnaires. Hence, 384 women with fully completed questionnaire formed the analytical sample. A complete case approach was used in the analysis where only respondents with no missing values for any variable were included. Most (28.9%) were aged between 36-40 years, and they were mostly employed in the IT industry (40.4%) and private sector (85.2%). In MH, 87.8% experienced regular cycles, 80.5% had a mean cycle duration of 29-34 days, and 60.7% had normal menstrual flow. Menstrual symptoms (MS) also had a notable impact on productivity at 52.9%, who reported work impairment, and factor analysis identified reduced productivity to have a stronger correlation with MS than with absenteeism. Overall, the research outcomes support that workplace policies to address MH are needed for employee welfare.

The range of 36-40yrs had the highest percentage (28.9%), and that of 31–35 years had the lowest (20.6%). This refers to women who typically go through 1st menstrual cycle (also Ménarche), for an average of 12.25 years.[41] When moving through the later part of the menstrual cycle (luteal phase) as well as during the menstruation phase, young and middle-aged females are likely to go through premenstrual syndrome (PMS), which is followed by adverse physical, behavioural and emotional symptoms.[42] Participants who are 40 years old or younger at this age menstruation will most likely interfere with their everyday life.[43] Among the 384 respondents' occupations, the majority (40.4%) worked in the IT industry, followed by healthcare (34.9%) and educational (24.7%). Moreover, most respondents (85.2%) worked in the private sector, whereas 14.8% worked in the government sector. Additionally, almost half (46.4%) had their first menstruation at 10-12 years, whereas 53.6% had it at 13-15yrs. Most (80.5%) of them had a 29-34-day cycle, with 12.8% having more than 35 days of cycles. Menstrual bleeding was variable with 60.7% reporting normal bleeding, 32.6% light bleeding, and 6.8% heavy bleeding.

A large percentage of respondents (34.9%) were often considered absent during their periods, and 24.2% considered it very strongly. On the other hand, 33.9% did not think about absence at all, and a low percentage (6.5% somewhat, 0.5% moderately) occasionally thought about it.

Table 1: Communalities of workplace behavior and menstrual impact variables

ITEMS	p-value
I am good at resisting temptation.	.639
I am lazy	.877
I say inappropriate things	.856
I have trouble concentrating	.584
I am able to work effectively towards long-term goals	.674
During periods, I think about being absent	.587
I spend work time on personal matters	.779
I leave my work station early	.751
I day dream.	.753
I put less effort on work during periods	.863
I let others do my work for me	.847

Table 2: Total variance explained by principal components

Component	Initial Eigenvalue	% of Variance (Cumulative %)
I am good at resisting temptation	4.304	39.130%
I am lazy	2.511	61.962%
I say inappropriate things	1.395	74.640%
I have trouble concentrating	0.872	82.564%
I am able to work effectively towards long-term goals	0.635	88.340%
During periods, I think about being absent	0.451	92.438%
I spend work time on personal matters	0.366	95.769%
I leave my work station early	0.241	97.956%
I daydream	0.119	99.035%
I put less effort on work during periods	0.075	99.715%
I let others do my work for me	0.031	100.000%

This shows a split view, with the most being highly affected, while the others are not.

A moderate level of sample adequacy is reflected in the KMO measure of 0.60, which suggests that factor analysis is sufficient. The non-identity correlation matrix was suggested by the highly significant outcome of "Bartlett's Test of Sphericity" (χ^2=3516.134, df=55, p<.001). This means that even with a moderate KMO value, the data were suitable for factor analysis.

The findings partially support the hypothesis, with a better correlation between MS and lower productivity than absenteeism (Table 1). Very high communalities for "I put less effort on work during periods" (.863) and "I spend work time on personal matters" (.779) establish a distinct effect on productivity. Yet, "I think about being absent during periods" (.587) has a lower figure, indicating absenteeism is affected but to a lesser degree.

A "*Component"* as mentioned in Table 2 refers to a new axis created by combining the original variables where each component points in a direction capturing a distinct pattern of variation in the data set. The *Eigenvalue* for each component quantifies how much of the total variance it explains. For e.g., a larger eigenvalue means that component captures more of the data's spread. The *% Variance Explained* converts that eigenvalue into a proportion of the overall variance that show the importance of each component on its own. Finally, the *Cumulative % Variance* tracks how much total variability is covered as the components are included in order. A large underlying structure in the data is evidenced by the findings, which reveal that the first three components explain 74.64% of the variation. The high correlation between MS and lower productivity is evidenced by the high communalities of "I spend work time on personal matters" (.779) and "I put less effort on work during periods" (.863). However, the relatively lower communality for "I think about being absent during periods" (.587) suggests that while absenteeism is affected, loss of productivity is better captured. Generally, the findings validate the hypothesis regarding reduced productivity rather than absenteeism.

The chi-square test results strongly support the hypothesis that greater severity of MS is related to lower productivity and increased absenteeism (Table 3). The highly significant Pearson Chi-Square (204.248, p =.000) and Likelihood Ratio (149.775, p =.000) showed a strong association between MS and lower productivity. The significant Linear-by-Linear Association (32.039, p =.000) indicates that productivity decreases uniformly with increased symptom severity. These

Table 3: Association between difficulty in concentration and menstrual cycle regularity

Test Statistics	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	204.248[a]	4	.000
Likelihood Ratio	149.775	4	.000
Linear-by-Linear Association	32.039	1	.000

Table 4: Association between ddfficulty in concentration and menstrual flow

Test Statistics	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	542.888[a]	8	.000
Likelihood Ratio	389.268	8	.000
Linear-by-Linear Association	10.825	1	.001

Table 5: Chi-square test results (comparison of productivity during menstruation and non-menstrual days by menstrual flow)

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	496.221[a]	6	.000
Likelihood Ratio	333.091	6	.000
Linear-by-Linear Association	31.661	1	.000
N of Valid Cases	384		

results suggest that people with greater symptom severity can have difficulty sustaining work performance (H1 is accepted).

The results reveal clear support for the hypothesis of stronger severity of MS correlating with lower productivity and increased absenteeism (Table 4). The significant Pearson Chi-Square value (542.888, p = .000) and Likelihood Ratio (389.268, p = .000) suggest that there is a high correlation between the severity of MS and the levels of productivity. Moreover, the substantial Linear-by-Linear Association (10.825, p =.001) indicates an apparent trend whereby more severe symptoms relate to less productivity. The findings support the theory that individuals suffering from more serious MS are more prone to problems in work performance and possibly increased rates of absenteeism (H2 accepted).

The outcomes confirm strongly that more severity of MS relates to lower productivity and increased absenteeism (Table 5). The significantly high Pearson Chi-Square (496.221, p =.000) and Likelihood Ratio (333.091, p =.000) demonstrated a strong relationship between productivity level and menstrual flow. In addition, the high Linear-by-Linear Association (31.661, p = .000) indicates a significant trend, where heavier flow menstruation, usually associated with more severe symptoms, such fatigue and pain correlate with more productivity declines. These results indicate that those with heavier flow are likely to perform worse at work, thus underscoring the association between symptom severity, lower productivity, and absenteeism.

Discussion

The study revealed important trends in the demographic, occupational, and MH attributes of the respondents, revealing the effect of menstruation on productivity at work. The findings revealed that the most common age group among the respondents was 36-40 (28.9%) and worked mostly in the IT industry (40.4%), with most working in the private sector (85.2%). These demographics indicate a labour force that is largely active in high-pressure, deadline-based settings where efficiency is a paramount issue. This aligns with a study where premenstrual disorders have a great influence on work productivity, functional ability, and daily functioning and are more prevalent and more poorly performed in teachers than in industrial workers.[44]A high percentage of respondents reported regular cycles (87.8%) and a normal cycle length of 29-34 days (80.5%). In addition, 60.7% of the patients had normal menstrual flow. Although these figures signify a generally normal menstrual experience, they also

underscore that, even in those with regular cycles, MS does affect every day functioning considerably. Another cross-sectional survey evaluated influence of menstrual Syndrome on QoL(quality of life) among 493 health workers. Outcomes revealed a significant correlation between QoL and variables, such as age, occupation, marital status, regularity of cycles and severity of menstruation. [45]

A significant feature of this study is the perceived effect of menstruation on job performance. More than half of the participants (52.9%) were admitted to productivity loss due to MS, showing the far-reaching impact of menstruation on work efficiency. Pain, lethargy, and mood changes can cause inability to concentrate, delayed work performance, and higher levels of distress during working hours. In addition, working conditions that are not supportive of menstrual needs can augment these problems, resulting in even greater interference in performance. A similar study evaluated the impact of premenstrual disorders on workplace productivity and absence in women aged 15–45 years. Women who experienced moderate-to-severe "PMS/PMDD" reported far higher levels of absenteeism and productivity impairment (>8hrs/cycle: 14.2% vs 6.0%). They also had more days with decreased efficiency, indicating that moderate to severe “PMS/PMDD” is responsible for work inefficiency and economic burden.[46]

Factor analysis indicated that the link between decreased productivity and MS is more robust than that between absenteeism and menstruation. This implies that even though most employees continue to report to work despite menstrual pain, they are less capable of working at maximum efficiency. Presenteeism, where employees are present but not entirely productive is a serious concern. This trend has severe implications for both employee well-being and organizational efficiency, as reduced productivity can contribute to overall workplace inefficiency and higher healthcare spending. The interventions targeted menstrual products, WASH facilities, policies, education, and behavior change, which increased awareness, confidence, and social support. Interventions enhance comfort, lessen stigma, and increase job satisfaction and performance.[47] A 2023 study demonstrated that such interventions significantly reduced presenteeism among employees reporting moderate to severe menstrual symptoms.[48] In workplaces where MH policies were implemented, employee-reported well-being improved and productivity losses were substantially limited.[49] Lastly, organizations with regular menstrual literacy sessions reported enhanced awareness, improved support seeking behaviour and de-stigmatization especially among young employees.[50] As recommended by International Labour Organization (ILO), such initiatives are in alignment with global calls for entrenching menstrual health within occupational health strategies.

Altogether, the findings are in consistence with large scale surveillance data which shows that menstrual symptoms more commonly result in reduction of job output with presenteeism than complete absenteeism with estimates of loss of annual productivity that range from 9 to 23 days even when sick leave is seldom used.[51] In this study, factor analysis already confirms this trend where menstrual symptoms show a stronger association with self-reported productivity that declines with absence. It reinforces the importance of considering performance impairments.

Hence, this study offers several strengths. It is one of the few investigations to comprehensively estimate the correlation between menstrual symptoms and workplace productivity across multiple professional sectors. The large and diverse sample increases the reliability of the findings and the use of a validated instrument provides internal consistency in measuring menstrual health and work productivity. The implementation of statistical methods further strengthens the credibility of the results. There are also certain limitations that warrant caution. The cross-sectional design limits the causal inference and focus on self-reported productivity that recalls social desirability biases, in accordance with other menstrual health surveys.[52] The weightage of IT professionals may retrench the generalization of findings across other sectors like healthcare or education where job demands physical burden. Further studies are required that use longitudinal follow up with supervisor ratings and objective productivity metrics. This shall ensure deliberate

stratification for capturing sector specific dynamics.

Overall, this research emphasizes the importance of treating menstruation as an issue in the workplace and not an individual matter. By accepting the effects of MS on productivity and proactive measures, employers can design a better and more accommodative work cultures. Long-term strategies for embedding MH within workplace policies must be examined further in future studies, so that workers are empowered to deliver their best performance.

Conclusion

This study provides important information about the effect of MS on workplace productivity and absenteeism. The results reveal that although most employees work despite feeling uncomfortable, their productivity is greatly affected due to symptoms like pain, fatigue and difficulty in concentration. Presenteeism highlights the necessity for workplaces to adopt supportive policies that recognize MH as a key factor that affects employee well-being and efficiency. To develop a more inclusive workplace, organizations can consider the implementation of supportive policies such as flexible work arrangements, menstrual leave and enhanced facilities in the workplace. Breaking the stigma surrounding menstruation with awareness programs can also help encourage free discussion. By incorporating MH into workplace policies, employers can boost employee morale, minimize productivity loss and develop a more balanced work culture. Future studies should assess the efficacy of these interventions and investigate strategies to help employees manage MS while preserving professional effectiveness.

Conflict of interest

The authors confirm that they have no financial or personal relationships, interests, or affiliations whether direct or indirect with any individuals, organizations or entities that could have influenced or been influenced by the content, findings, or materials discussed in this manuscript.

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Data availability declaration

The data supporting the findings of this study can be obtained by reaching out to the corresponding author, who will gladly share them upon a reasonable request. All information has been carefully managed with full respect for participants' privacy and ethical standards.

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Authors contribution

All three authors played important and clearly defined roles in the development of this research. Dr. Dipanwita Chattopadhyay led the project, taking charge of designing the study, gathering and analysing the data and writing the initial draft of the manuscript. Dr. Suriyakala Perumal Chandran contributed by helping shape the research framework and provided valuable input during the analysis phase. Dr. Soumendra Nath Bandyopadhyay offered guidance throughout the project, overseeing the work and contributing thoughtful, critical feedback to strengthen the final paper. Each author has reviewed and approved the final version of the manuscript and accepts full responsibility for the integrity and accuracy of the work.

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