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Menstrual hygiene amongst school Girls: Still a messy business

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Menstrual Hygiene amongst School Girls: Still a messy business

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Abstract

Background: Menstruation has become a taboo topic among adolescent females, affecting their reproductive health, particularly in more traditional South Asian nations such as Pakistan. The study highlights the societal silence surrounds menstruation, which leads to detrimental practices and attitudes among school-age females. The study reveals the sociocultural, psychological, and educational challenges that teenagers encounter. The presence of myths and misconceptions adds to unsanitary habits, which undermine education and reproductive health.

Methodology A descriptive cross-sectional study was conducted in urban Karachi. The participants were 850 unmarried school-going female adolescents aged 13 to 19. The data were collected using a pre-coded questionnaire. SPSS version 10.0 was used for descriptive and inferential analysis. The significance level was set at a p-value of 0.05 for all analyses. Normal distribution was assessed using the Kolmogorov–Smirnov test.

Results: The mean age was 15.39 (± 3.266) years, with an average of 7.67 (± 2.119) years of schooling. Only 59 % (n=501) received information before menarche, and 94% (n=797) did not own a TV. Good menstrual knowledge was demonstrated by 72.4 % (n=614). Unhealthy practices were prevalent in 49.8 % (n=422) of participants. There was a significant difference in practices based on educational background.

Associations were found between prior information and menstrual knowledge ($\chi^2 = 6.058$, $p = 0.012$) but not between school type and TV ownership. Multivariate analysis revealed that prior information significantly influenced knowledge (OR: 1.481, 95% CI: 1.082-2.027). Meanwhile, schooling positively influenced practices (Adjusted OR: 1.106, 95% CI: 1.036-1.182), while school type exhibited a reverse association (Adjusted OR: 0.636, 95% CI: 0.483-0.836).

Conclusion: There exist intricate challenges surrounding menstruation in urban Karachi, reflecting the absence of sex education in Pakistan. This study advocates for comprehensive strategies to enhance reproductive health education and practices among young women. The study advocates for sex education at the secondary level to help empower adolescent girls. The two potential sources that should be targeted are the midwives who have access to the childbearing mother and their families, and other female members in the community, and the schools where females feel comfortable asking questions that help to mitigate local myths. Community midwives can play a significant role in deciphering what knowledge is being communicated to adolescents.

Keywords: Menstruation, Hygienic practices, adolescents, Menstruation management

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Introduction

Adolescence is a critical period in women's lives characterized by first menstruation, a biological event linked with significant physical, emotional, cognitive, and social changes [1, 2]. Despite being a natural process, most of the Southeast Asian countries consider menstruation a taboo [1–6]. This has direct implications for the reproductive health of female adolescents as has been stressed and deemed necessary by WHO/UNICEF asserting that "Menstrual Hygiene Management should be universally recognized, promoted, and practiced as a fundamental to good health, dignity, and quality of life [1]. Although reproductive health in Pakistan has received considerable attention in recent years, issues related to menstrual management and practices among underprivileged female adolescents need further investigation.

Adolescents with access to secondary education are better aware of menstrual hygiene (Panda et al., 2023) [7]. However, in Pakistan, this assumption seems baseless; with few exceptions, there is no provision of sex education in the country at the secondary school level. In a recent study exploring the awareness and perception of Pakistani adults regarding sex education in secondary schools, a high percentage (71%) suggested

imparting sex education in high school based on the maturity and sensibility of students [2]. The lack of sex education makes school-going adolescent females a vulnerable population who often rely on informal sources such as family and friends for Information on how to manage their menstruation (Hebert et al. 2017) [8]. In Pakistani families, talking about sex is still taboo, and discussing reproductive health is still not a priority in families, as also found in neighboring India [3]

Menstruation is currently defined as cyclic bleeding that occurs from the uterine corpus between menarche and menopause [9, 10]. Menstruation is a physiological process in which bleeding occurs for one to eight days. Menstrual practices and management still have some socio-psychological and cultural implications attached to them. A recent scoping review revealed that cultural perceptions and beliefs, economic and institutional resources, and primary sources of Information influenced the experience of menstruation and its management among adolescents going to school [3]. The same study reported that menstruation remained shrouded in secrecy and shame for many girls, leading to absenteeism from school. These findings underscore the need to explore further cultural practices and beliefs about menstruation that influence school

attendance and the long-term educational prospects of adolescent girls [3]. School attendance is not the only factor affecting adolescent girls. Menstruation restricts female adolescents in many ways, including avoiding social gatherings [4]. Menstruating girls were often isolated by their families and treated differently because menstruation was considered shameful and taboo, which enhanced girl's negative view of menstruation [5]. A study conducted in India on school-going girls reported that 29.4% of girls stated that menstruation affected their school attendance, as 52.7% of girls were absent on the first day and 40% on the first two to three days of their menstrual cycle. In addition to this, 42.8% of girls stopped performing all household duties during their periods [6].

These socio-cultural and psychological limitations somehow restrict adolescents from reaching out for medical help and related information. In a recent study conducted in Pakistan, the health-seeking behaviour of adolescents was categorized as "Good, Satisfactory and Poor" (44.5% vs 46.8% vs 8.5%), respectively [10]. These attitudes, along with the inappropriate perceptions about the menstrual period, could increase their chances of getting certain infections. Lack of awareness of menstrual hygiene and care during menstruation caused by a lack of knowledge, attitudes, and behaviours related to menstruation and menstrual hygiene can cause problems for adolescents [11].

Historically, myths associated with this normal physiological phenomenon persist in varying forms in different cultures. It was

believed that menstruating women could cause "meat to go bad, wine to turn sour, and bread dough to fall". A study conducted in Karachi showed some similar misconceptions around the myth of deterioration in the process of preparing pickles when handled by a menstruating woman [4]. The study in Karachi highlighted that 65% of participants do not take a bath in the initial (3-4) days of their menstruation cycle, and half of those 65% do not take a bath during the entire menstrual cycle. [4].

The development of scientifically accurate, age-appropriate, and context-relevant sex education and identifying modalities for its effective implementation remains a significant challenge in Pakistan [11]. The issue becomes more contentious with the lack of open communication between parents and adolescents.

This can lead to various reproductive health problems during women's reproductive life such as reproductive tract infections and gynecological issues [12]. This study aims to explore knowledge and hygiene practices about menstruation among school-going adolescents in urban Karachi, Pakistan.

Methods

This study employed a questionnaire in a cross-sectional study design among unmarried adolescent schoolgirls (aged 13-19) in both government and private schools in Karachi. Each community had one government school and several private schools. These schools were randomly selected. The data were collected using a pre-coded questionnaire developed after conducting four Focus Group Discussions

(FDG) and ten in-depth interviews with the adolescents and their mothers. Later, the data were thematically analyzed.

The sample size of 850 female adolescents from selected schools was determined through power calculation using Epi Info Version 6. A systematic sampling technique ensured representation from both private and government school categories. All eligible adolescent girls were included at the school level based on school principals' registration data. The calculation aimed to detect differences in menstrual practices among two groups, estimating the proportion of females using hygienic materials during menstruation based on a 15.6% prevalence of those using unhygienic materials. With a significance level of 5% and a bound of error of 5%, the total sample size of 850 was evenly distributed between private and government schools.

Data Collection instrument

A pretested questionnaire was used, which probed knowledge about menstruation; physiological and biological concepts regarding menstruation; the amount of bleeding assumed as usual during menstruation; rationale for the practices, sources of information regarding menstruation and the practices followed; bathing, nutritional intake, social, cultural, and religious restrictions. The questionnaire was developed based on the baseline assessment conducted through a qualitative approach. Initially, one data collector was identified from each area where the schools were situated. These data collectors received two days of training from the principal investigator, followed by the questionnaire

pretesting. The feedback from the data collectors was incorporated, and the final questionnaire was translated into English to check discrepancies in translation. There were a few differences between the two English versions. The final questionnaire was both in English and Urdu.

Study Analysis

The data were entered in Epi-info version 9 and transferred to SPSS version 10.0 for descriptive analysis. To assess the association between predictors of knowledge and practices about menstruation, inferential statistics, including chi-square test of independence, T-test for two independent samples, and univariate and multivariate logistic regression was used to assess the relationship between the outcome and the predictors of knowledge and practices among school going adolescents (Table 2). The significance level has been set at a p-value of 0.05 for all analysis. Normal distribution was assessed using Kolmogorov–Smirnov test. The level of knowledge and practices regarding menstruation were taken as outcome variables of the study. Five questions, each from a current knowledge level and practice of menstruation, were selected. The cut-off of 60%, with three correct answers out of five, was chosen to assess participants' knowledge of menstruation. This threshold ensures that participants score more than half of the questions, indicating some knowledge related to effective menstrual management.

The knowledge level is defined as participants' understanding of menstruation, menstruation bleeding and their perceptions about hygiene during menstruation (bathing

knowledge, such as whether one should take a bath and whether bathing affects menstruation flow). In addition, knowledge regarding diet was also explored, including whether diet should be altered during menstruation. Practices regarding menstruation, defined as the kind of material used to absorb menstrual bleeding, hygiene practices during menstruation, alteration in dietary practices including water intake during menstruation, and level of social or physical activities during menstruation were explored.

Ethical considerations

Institutional ethical approval was obtained from The Aga Khan University and John Hopkins University. An introduction to the study was given to the study subjects in Urdu/the local language. Verbal and written

consent were obtained from girls and their mothers/teachers. Results were disseminated among school students. This was followed by rigorous health education at schools, and written health education messages were provided to girls and their mothers.

Results

The mean age of participants was 15, and they had, on average, nearly eight years of schooling (Table 1). Of 850 participants, 40.9% (n= 347) had received Information before menarche. Television (TV) owned by the participants was taken as a proxy for the knowledge level of menstruation and whether television was any source of Information related to enhanced reproductive health-related knowledge. Most, around 94 % (n = 797), did not own a TV (Table 1).

Table 1: Demographic details of adolescent participants (n=850)

Variables	Frequency (Percentage) N (%)
Age (Mean ±SD)	15.39 (±3.266)
Years of Schooling ((Mean ±SD)	7.67 (±2.119)
Had prior Information about menstruation	347 (40.9%)
No prior information on menstruation	501 (59.1)
Government School	424 (50%)
Private school	424 (50%)
Own a TV	51 (6%)
Not own a TV	797 (94%)
Good knowledge	614 (72.4%)
Poor of knowledge about menstruation	234 (27.6%)
Unhealthy practices regarding menstruation	422 (49.8%)
Healthy practices regarding menstruation	426 (50.2%)

Most, 72.4 % (n=614), possessed good knowledge about menstruation, whereas 27.6 % (n=234) had shown to have poor knowledge about menstruation. As far as the practices regarding menstruation were concerned, 49.8% (n=422) of the participants exercised unhealthy practices, and 50% (n=426) were shown to engage in healthy practices of menstruation (Table 1).

The assessment of menstruation-related knowledge and practices among students in government and private schools shows notable disparities. A descriptive analysis showed that adolescents in government schools had higher rates of poor knowledge about menstruation (37%) than those in private schools (35%). Conversely, private school students showed a higher percentage

of good knowledge (14.9%) than government school students (12.6%). Unhealthy practices were also more prevalent among government school students (28%) than private school students (22%). Overall, these findings emphasize the importance of targeted interventions in government and private schools to improve adolescent menstrual knowledge and practices.

Similarly, the results indicated a lack of significant statistical difference between the level of knowledge about menstruation and the number of years of schooling. Consequently, the evidence suggests that the difference in age and the number of years of education has no significant impact on the level of knowledge about menstruation among adolescents.

Table 2: Menstrual knowledge & practice with age & years of schooling (n=850)

Level of Knowledge	Poor Mean (±SD)	Good Mean (±SD)	P- Value
Age in (years)	15.29 (1.729)	15.67 (5.550)	0.251
Years of schooling	7.64 (2.168)	7.73 (1.990)	0.163
Menstrual practices	Unhealthy Mean (±SD)	Healthy Mean (±SD)	P- Value
Age	15.19 (1.558)	15.59 (4.334)	0.079
Years of Schooling	7.42 (2.108)	7.91 (2.105)	0.001*

Contrary to this, the analysis revealed a significant difference in menstruation practices concerning the number of years of schooling (p-value = 0.001). Interestingly, age did not exhibit any significant difference

in the observed variations, suggesting that educational background plays a role in shaping menstrual practices. In contrast, age may not be a decisive factor.

Table 3: Factors associated with menstrual knowledge and practice (n=850)

	Menstrual Knowledge χ^2 value	Menstrual practice χ^2 value
Prior Information about menstruation	6.058*	2.961
Type of School	2.361	12.755*
TV at home	0.090	0.219

*Significant at 0.05.

Table 3 examines the association between menstrual knowledge levels and factors such as type of school, prior Information about menstruation, and TV ownership among school-going students. Notably, a significant association exists between a student's prior knowledge of menstruation and their overall menstrual knowledge ($\chi^2 = 6.058$, p-value = 0.012). However, the type of school and TV

ownership at home do not significantly impact students' overall knowledge levels. However, a statistically significant association was observed between prior Information about menstruation and current practices ($\chi^2 = 2.961$, p-value = 0.085). This suggests that the type of school attended has a notable influence on the current menstrual practices of the students

Table 4: Factors associated with menstrual knowledge level (n=850)

Variables	Odd Ratio	95% (CI)
Age	1.035	0.979-1.094
Years of schooling	1.018	0.943-1.093
Prior Information	1.481	1.082-2.027
Types of school (Government =Ref)	1.267	0.937-1.713
Own TV	1.100	0.590-2.049

In the univariate analysis, students' age and year of schooling exhibited nonsignificant associations with menstrual knowledge. Additionally, possessing prior Information about menstruation significantly increased the likelihood of knowledge by 48.1%. While attending private schools suggested higher knowledge odds, this association was not statistically significant. Similarly, TV

ownership showed minimal, nonsignificant association with menstrual knowledge. These findings highlight the importance of prior Information among adolescents in shaping menstrual knowledge in urban settings. Multivariate logistic regression test for knowledge level was not applied because only one variable was significant in regard to knowledge about menstruation

**Table 5: Factors associated with menstrual practice: univariate/multivariate analysis
(n=850)**

Variables	Unadjusted Odd Ratio	95% (CI)	Adjusted odd Ratios	95% (CI)
Years of schooling	1.118	1.047-1.194	1.106	1.036-1.182
Types of school	1.637	1.248-2.148	0.636	0.483-0.836
Age	1.075	0.993-1.165		
Prior Information	1.272	0.967-1.674		
Own TV	0.873	0.495-1.540		

Table 5 provides insights into factors influencing menstrual practices through univariate and multivariate analyses. The unadjusted odds ratios show that each additional year of schooling is associated with a higher likelihood of favorable menstrual practices (1.118, 95% CI: 1.047-1.194). This positive association persists even after adjusting for other variables (Adjusted Odd Ratio: 1.106, 95% CI: 1.036-1.182). Conversely, the type of school attended initially shows a positive association (unadjusted odd ratio: 1.637, 95% CI: 1.248-2.148), but this relationship reverses in the adjusted analysis (adjusted odd ratio: 0.636, 95% CI: 0.483-0.836), indicating lower odds of favorable menstrual practices for certain school types. Age, prior Information, and owning a TV did not demonstrate statistically significant associations in either analysis. These findings underscore the nuanced interplay of various factors in shaping menstrual practices among school adolescents and emphasize the need for comprehensive interventions that consider educational settings and school types.

Discussion

The current study findings are similar to those conducted in low- and middle-income countries [11]. These findings corroborate the emerging evidence on adolescent girls' perceptions and cultural beliefs about menstruation and menstrual practices found in a scoping review [3]. This scoping review summarizes those cultural myths, misconceptions, and inadequate knowledge of menstruation that negatively influenced the experiences of girls. Our study mainly reported inadequate and incorrect knowledge among adolescents regarding menstruation.

This contrasts with the findings from a recent study conducted in Ethiopia, where 72.5% of school adolescents had good overall knowledge about menstruation and only 34.7% had adequate MHM practice [12]. Nevertheless, females from private schools were found to have sufficient knowledge compared to those from public schools. In Pakistan, education quality is declining even though the government is trying to improve the quality and quantity of education by

introducing free education at the secondary level. The government emphasizes quantity, not education quality [13].

Comparatively, the private sector schools, though fewer in number, offer better and quality education and, hence, conduct sessions on pubertal-related issues with male and female adolescents separately. However, these sessions only occur with the prior permission of their parents. In addition, most adolescents from private schools belong to middle and high socio-economic strata, where they can easily access resources such as the Internet and media facilities to learn about menstruation. The present study's results were statistically insignificant (p -value 0.767), and most people did not have television in their homes. However, the culture of the community is such that people usually go to neighbors to watch TV. Despite having access to television, the culture, family dynamics, and societal values of perceiving the topic as taboo, the females either avoid or shy off from such discussion. In contrast, a recent study from Bangladesh reported that sanitary-protection-related TV advertisements usually provide Information about awareness, knowledge, and hygiene related to menstruation. They play vital roles in changing the attitude toward menstrual taboos [14].

These contrasting attitudes toward sanitary pad advertisements identify the need to strategize the role of healthcare workers, especially the midwives who visit homes both in rural and urban areas, to educate female family members, most importantly mothers, about this phenomenon. These midwives must be adequately trained to

deliver sessions, explaining how to prepare their daughters and prospective female adolescents for menarche and how to manage menstruation hygienically. This will help mothers to impart factual knowledge to their daughters and abstain from passing on all sorts of myths surrounding this natural biological process. The Information and preparation that adolescent girls receive when it comes to menarche and menstruation may be considered a central factor in how it is viewed and managed [3].

Despite the divide among public and private school participants related to quality education, access to Information, parents' literacy, household commodities, etc., the behaviours undertaken to manage menstrual bleeding were not significantly different. This study reports unhygienic menstrual management practices among both public and private schools. Only 22% of participants were engaged in healthy practices. Recent research classifying menstrual hygiene management practices indicated that 36.9% of respondents followed bad, 33.4%, and 29.7% followed fair and good practices. Variations in menstrual hygiene management practices show that urban adolescent girls had better and fairer practices than rural girls [13]. Besides the myths related to the use and disposal of absorbent material [4], the high frequency of unhygienic practices in our context could be attributed to proper and separate washrooms in schools and at home and the affordability of sanitary pads. A study conducted in Côte D'Ivoire found that 87% of girls felt that the school environment was unhealthy. A similar study found that 82% of school facilities in Bangladesh were deemed unhygienic, and the lack of gender-separated

adequate toilets negatively influenced menstrual hygiene management and increased absenteeism [15].

Sharing similar contexts, these beliefs, primarily based on myths, usually stem from the Information transmitted from one generation to another by mothers regardless of their level of education. The studies so far focus on the knowledge level regarding menstruation and practices related to its management. It is time for research on this crucial topic to focus on the sources of Information that adolescents receive. If proper, factual, and timely Information is disseminated to them, there is a high chance of improvement in knowledge and practices related to menstruation. The two potential sources that need to be targeted are the midwives who have access to the mothers and other female family members in the community and the schools where females feel comfortable asking questions that help to mitigate the myths [16]. Working at one end and ignoring the other may lead to conflicts between what is preached at schools and the myths-laden Information of their mothers. To avoid these conflicts and pave the way for better reproductive health for adolescents, simultaneous education [17] at the two ends becomes essential.

Limitations and Strengths of the Study

The sample represents only school-going adolescents and cannot be generalized to all females. The proportion of females going to school in Karachi is far lower than that of females not going to school. Hence, the potential population that needs to be educated is higher in proportion and needs attention. Although data was collected from school-

going female adolescents, the participants were hesitant to provide relevant Information due to the topic's sensitive nature. The girls are likely forbidden to talk about their practices in public, which comes from their upbringing.

The study's strength is that the researchers explored the most sensitive topic among the most sensitive age groups. The researcher built a rapport with the participants, which helped her collect the data smoothly.

Conclusion

The study depicted that adolescents' knowledge about pubertal changes, particularly hygienic menstrual management practices and relevant knowledge, is critical in their lives. The family environment and cultural norms play an essential and crucial role in providing a comfortable space for discussing age-appropriate health education at the right time from the right source. Schools should also be instrumental in providing awareness of pubertal-related issues in a comfortable milieu, and policies related to adolescents' health need to be formulated at the national level to address the health needs of this critical cadre of population. The two potential sources that need to be targeted are the midwives who have access to the mothers and other female family members in the community and the schools where females feel comfortable asking questions that help to mitigate the myths. Community midwives can play a significant role in deciphering what knowledge is being communicated to adolescents. Working at one end and ignoring the other may lead to conflicts between what is preached at schools and the myths-laden

Information of their mothers. To avoid these conflicts and pave the way for better reproductive health for adolescents, simultaneous education at the two ends becomes essential.

Conflict of interest: None

References

1. WHO/UNICEF. Consultation on drafting a long list of goals, target, and indicator options for future global water, sanitation and hygiene monitoring. 2012.
2. Imtiaz, B., & Yasin, S. A. (2023). SEX EDUCATION: AWARENESS AND PERCEPTION OF PAKISTANI ADULTS. *Pakistan Journal of Society, Education, and Language (PJSEL)*, 9(2), 232-239.3.
3. Fennie, T., Moletsane, M., & Padmanabhanunni, A. (2022). Adolescent girls' perceptions and cultural beliefs about menstruation and menstrual practices: A scoping review. *African Journal of Reproductive Health*, 26(2), 88-105.
4. Rizvi, N., & Ali, T. S. (2016). Misconceptions and Mismanagement of Menstruation among Adolescent Girls Who Do Not Attend School in Pakistan. *Journal of Asian Midwives (JAM)*, 3(1), 46-62.
5. Davis J, Macintyre A, Odagiri M, Suriastini W, Cordova A, Huggett C, Agius PA, Faiqoh F, Budiyan AE, Quillet C, Cronin AA, Diah NM, Triwahyunto, A, Luchters, S and Kennedy E. Menstrual hygiene management and school absenteeism among adolescent students in Indonesia: evidence from a cross-sectional school-based survey. *Tropical Medicine & International Health*. 2018;23(12):1350-63.
6. Rastogi, S., Khanna, A., & Mathur, P. (2019). Uncovering the challenges to menstrual health: Knowledge, attitudes and practices of adolescent girls in government schools of Delhi. *Health Education Journal*, 78(7), 839-850.
7. Panda, N., Desaraju, S., Panigrahy, R. P., Ghosh, U., Saxena, S., Singh, P., & Panda, B. (2023). Menstrual health and hygiene amongst adolescent girls and women of reproductive age: a cross-sectional study from Odisha, India.
8. Herbert, A. C., Ramirez, A. M., Lee, G., North, S. J., Askari, M. S., West, R. L., & Sommer, M. (2017). Puberty experiences of low-income girls in the United States: a systematic review of qualitative literature from 2000 to 2014. *Journal of Adolescent Health*, 60(4), 363-379.
9. Critchley, H. O., Babayev, E., Bulun, S. E., Clark, S., Garcia-Grau, I., Gregersen, P. K., ... & Griffith, L. G. (2020). Menstruation: science and society. *American journal of obstetrics and gynaecology*, 223(5), 624-664.
10. Jabeen, R., Rehman, M. U., Masood, S., Mahmood, H., & Mashhadi, S. F. (2018). ASSESSMENT OF FUNCTIONAL HEALTH LITERACY AMONG ADOLESCENTS OF MODEL SCHOOLS OF ISLAMABAD: Functional Health Literacy. *Pakistan Armed Forces Medical Journal*, 68(3), 545-

11. Chandra-Mouli, V., & Patel, S. V. (2020). Mapping the knowledge and understanding of menarche, menstrual hygiene and menstrual health among adolescent girls in low-and middle-income countries. *The Palgrave handbook of critical menstruation studies*, 609-636.
12. Dar, M. A., Maqbool, M., Gani, I., & Ara, I. (2023). Menstruation hygiene and related issues in adolescent girls: A brief commentary. *International Journal of Current Research in Physiology and Pharmacology*, 1-5.
13. Betsu, B. D., Medhanyie, A. A., Gebrehiwet, T. G., & Wall, L. L. (2023). "Menstruation is a fearful thing": a qualitative exploration of menstrual experiences and sources of Information about menstruation among adolescent schoolgirls. *International Journal of Women's Health*, 881-892.
14. Nadeem, A., Cheema, M. K., & Zameer, S. (2021). Perceptions of Muslim parents and teachers towards sex education in Pakistan. *Sex Education*, 21(1), 106-118.
15. Gizachew Abdissa Bulto (2021) Knowledge on Menstruation and Practice of Menstrual Hygiene Management Among School Adolescent Girls in Central Ethiopia: A Cross-Sectional Study, Risk Management and Healthcare Policy, 14: 911-923, DOI: 10.2147/RMHP.S296670.
16. Awan, A. G., & Zia, A. (2015). Comparative Analysis of Public and Private Educational Institutions: A case study of District Vehari-Pakistan. *Journal of Education and Practice*, 6(16), 122-130.
17. Poly, L. N., & Eyemoon, E. J. (2020). TV advertisement and menstrual hygiene management. *International Journal of Social Science Research*, 8(1), 38-52.
18. Evans, R. L., Harris, B., Onuegbu, C., & Griffiths, F. (2022). Systematic review of educational interventions to improve the menstrual health of young adolescent girls. *BMJ open*, 12(6), e057204.
19. Shumie, Z. S., & Mengie, Z. A. (2022). Menstrual hygiene management knowledge, practice and associated factors Among School Girls, Northeast Ethiopia. *Plos one*, 17(7), e0271275.
20. Alam MU, Luby SP, Halder AK, Islam K, Opel A, Shoab AK, Ghosh PK, Rahman M, Mahon T and Unicomb L. Menstrual hygiene management among Bangladeshi adolescent schoolgirls and risk factors affecting school absence: results from a cross-sectional survey. *BMJ open*. 2017;7(7):1-10.