

Supportive nursing interventions for empowering adolescent girls in practicing safe menstrual hygiene

Mahmoud H. Alrabab'a^{1*}, Roqia Maabreh², Madiha Amin Morsy³, Yazan Alkhsealat⁴

¹Prince Al-Hussein Bin Abdullah II Academy for Civil Protection Al-Balqa Applied University

²Faculty of nursing, Irbid National University

³Faculty of Nursing - Ain Shams University- Cairo- Egypt

⁴Prince Al-Hussein Bin Abdullah II Academy for Civil Protection Al-Balqa Applied University

Abstract

The supportive nursing intervention is used by nursing profession when individual (adolescent) are able to provide care for themselves but need guidance and teaching to cover the deficit in knowledge and practice to be able to reach the desired goal that is safety menstrual hygienic practices. To assess the effectiveness of Supportive Nursing Interventions for Empowering Adolescent Girls in Practicing Safe Menstrual Hygiene. A quasi experimental design was employed to implement the study. Conducted in four secondary school of nursing selected randomly from total number of secondary nursing school of Cairo governorate. The multistage random sampling technique was used to select one hundred and twenty adolescent girls who were taken out of the specified settings. Data were measured in form of questionnaire that were designed to determine the knowledge and reported practice of adolescents on the pre and post implementation practice of the supportive nursing intervention about safety menstrual hygienic practice. The study revealed that, there was a statistically significant difference between pre/post implementation of supportive nursing intervention for safety menstrual hygienic practice. The study concluded that supportive nursing intervention had empowered adolescent's girls for safety menstrual hygienic practice. The study recommended continuous supportive nursing intervention to empower adolescent girls for safety menstrual hygienic practice, further study should be performed

Keywords: Supportive, Nursing intervention, empower, Adolescent girls, Safety menstrual hygienic

Introduction

The teen population is a very large and growing segment of the population of the world. At the moment, over 50 per cent of the global population is under 25 years of age, of which nearly every two youngsters are categorised as adolescents. This stage in development is critical in the development of the adult identity and maturity in both a physical as well as psychological sense. On a biological level, the hypothalamus has been the focus since it releases the growth hormone and gonadotropins that activates the occurrence of boys and girls physiological changes. Menstruation, which is manifested in the form of periodic vaginal bleeding as the uterus sheds its lining, is one of the indicators of puberty and usually happens one to two years after secondary sexual characteristics have appeared (Taheri et al., 2022).

Menstruation is a physiological process, but it is still viewed differently in different social and cultural settings. It is one of the most profound changes that

the girls undergo through the adolescence stage. Menarche Menstruation normally starts at the age of 11-15 with an average age of 13 years. The menstrual cycles in teenage girls could be erratic and are usually not similar to the other women. There is a release of light to heavy flow and the menstruation period differs amongst individuals. Failure to manage menstrual health can be associated with pain, menstrual tract infections, unpleasant smell, and feelings of social embarrassment, and so on (Attia et al., 2022).

Management of menstruation not only encompasses management of menstrual flow but also includes participation in day to day activities, which includes attending school or work. After acquiring confidence in handling her menstrual flow, a girl will usually be able to continue with her normal activities with greater ease. MHM focuses on the effective coping with monthly periods. MHH includes the menstrual hygiene habits that adolescent girls take to ensure they remain hygienic and maintain the healthiness of the girl during this time of the month by the

acquisition, use, and disposal of materials that absorb menstrual blood (Deriba et al., 2022).

Major areas of concern in menstrual hygiene encompass the most appropriate choice of feminine hygiene products, the frequency and timing of changing such products, correct bathing hygiene and vulvar / vaginal care and the supposed impacts of some practices like vaginal douching at the end of each menstrual period. By and large, the selection of sanitary protection is personal with a cultural slant and individual tastes. Any initiative aimed at assisting girls with period products must ensure that girls are central to any planning discussions and decision-making when it comes to the nature of materials or products offered (Dar et al., 2023; Behnam et al., 2024).

The issues of poor management of menstrual hygiene have been neglected or misperceived by both the society and policy makers so far. The sanitary pads are various shapes, styles and absorbency of dark days urges of menstrual bleeding. Some are built of removable strips of paper that expose the adhesive tape that is designed to cling to adolescent panties. Other pads possess wrap-around wings (under which adolescent panties can slip) that keep the pad in place to prevent unwelcome bunches. Others may desire the belt model in the pad is retained by using the belt (Gugu et al., 2011; Jam et al., 2011).

Girls need to make changes to their sanitary napkins frequently during periods when the flow has been heaviest mostly during the initial days. Teenage girls with sufficient knowledge with regard to menstruation have more chances of ensuring good hygienic care. Majority of persons who know more about menstrual hygiene and safe methods are less likely to get reproductive tract infections and related complications. Consequently, it can be seen that accurate information regarding menstruation at a young age could facilitate safe hygiene practice and ensure that health burdens faced by millions of women are reduced (Hasan, 2021).

Pediatric nurses have an equally important task of making sure that adolescent girls handle their menstruation in a hygienic and a dignified manner. Appropriate menstrual hygiene management is the safe collection, cleaning, drying and disposal of hygienic materials to preserve the health of the

person and others. Also, educating pre-adolescent girls about menstruation is necessary; this can be done by equipping them with the right information and knowledge of good menstrual hygiene practice so that they can have the confidence and knowledge of menstruation. (Massey 2011).

Significant of the study:

Hygiene is an important part of any person's total health maintenance. Hygiene entails practices which safeguard the health and well-being of the person as well as predisposing to health attitude towards menstruation and reproductive functioning. Menstrual hygiene is a concern that all the girls have to address in life, however there is under-awareness on process of menstruation and what the requirements are to achieve effective menstrual management, and the prevalence of the taboos around the subject does not allow girls to express their menstrual needs.

Girls during adolescence do not get proper and enough information on menstrual hygiene. This can lead to unhealthy and wrong behavior during their menstrual period. Many mothers lack correct information and skills to communicate about menstrual hygiene which they pass on to their children, leading to false attitudes, beliefs and practices in this regard. If the adolescent girl is having knowledge, adolescent girls will be able to practice hygienic practices during menstruation.

Aim of the study was to:

Evaluate the impact of Supportive Nursing Interventions on Empowering Adolescent Girls in Safe Menstrual Hygiene Practice with:

Evaluate the current understanding of adolescent girls on menstruation hygienic practices prior to provision of supportive nursing activity.

To formulate, implement and measure the success of the supportive nursing intervention by determining the increase in knowledge of adolescent girls on the knowledge on menstrual hygiene following the process of supportive nursing intervention..

Research hypotheses:

The change observed in practice related to menstrual

hygiene will be significantly changed due to the knowledge gained by adolescent girls who were subjected to the supportive nursing intervention on menstrual hygiene.

Subjects and Methods:

Research design: Research design was a quasi experimental research design. One group pre test post test design was adapted.

Independent variable: - In this study independent variable is supportive nursing intervention on menstruation and menstrual hygiene practices.

Dependent Variables:- In this study we are interested in knowledge of menstrual hygiene practices by adolescent girls as dependent variables.

Research settings: The study was carried out in four secondary school of nursing selected randomly from total number of secondary nursing school of Cairo governorate. One School from east, west, north, and south educational zones at Cairo governorate namely El Zawia , El Mounera, Ahmed Maher, and Manshyet El Bakry).

Subjects:

Study Population: The category of people used as a population in this study was all adolescent girls who were studying in secondary school of nursing Cairo governorate.

The samples size: The sample size was 120 adolescents girls from three selected zones of schools in one of the east, west, north, or south of governorate of Cairo

Sampling technique

By Multi stage random sample technique was conducted in this study. The first stage: The total numbers of secondary school of nursing are 40 east, west, north, and south in Cairo governorate. Second stage 10% of those schools were selected randomly which was 4 secondary school of nursing. Third stage from each school one class selected randomly. 4 classes obtained and each class contains approximately 30 students. The total number was 120 students.

II. Operational design:

1- Preparatory phase:

A search of the previous and existing related literature on the aspects of menstrual hygienic management was conducted by use of available books, articles, periodicals and magazines as well as internet search to familiarize with the research problem and to draft the study tools.

Field work

The real field work was conducted Within three months The target population of study (adolescent girls) was sampled and they chose to take part in the study. With an approval of the school authority, the class-teachers of the four schools were briefed about the motive of the study and the rapport was established with the adolescent girl and verbal consent was elicited out of them. The data was collected in the classroom of teenager girls. The girls were provided with a seat space between them when filling out the questionnaire and did not have an opportunity to talk to one another so that they could not affect the answers of each other. Adolescent girls volunteered and girls were free to leave the study at any one point, that is, they were not given a reason to back out. Adolescent girls were authorized to decline to participate or cease participation. The manner in which data will be used and promised to keep confidentiality about adolescent girls answers. The supported nursing intervention was performed in phases:

Assessment phase:

This was done to the adolescent before the introduction of the content of supported nursing intervention (pretest).The aim of this stage was to examine knowledge gaps in self management skills gaps that become barriers and provide technique of coping self care behavior and change (baseline assessment) in adolescents. The role of the researcher who is supposed to place her task to detect the deficit of knowledge of the subjects and skills was, though by pre-treating, pre-testing the structured questionnaire; the topics she included were linked to awareness of menstruation; the source of information on menstruation, the hygiene maintained during the menstrual period and

activities banned during menstruation period. The girls who were in ages between 12 to 14 years were requested to complete a self-administered questionnaire that contained questions about their family background, age at menarche, type of sanitary protection they used during their last menstrual period, as well as, what they knew about the various sanitary protection materials. The questions targeted type of menstrual pads, the disposal and storage of pads.

Planning phase:

Based on the base line assessment of adolescents' need of the content of nursing supportive intervention, the researchers identify the topics and teaching approaches that are most appropriate for topics.

Implementation phase:

The goal of supportive nursing intervention is to enable the adolescents girls to acquire self-care behavior i.e. to achieve independence in regard to menstrual hygienic status. The researcher conversed with teenage girls during their class in their own school twice/week in 45 to 60 minutes two weeks. The implementation of the supportive nursing intervention took place over a period of 2-4week per class and therefore supportive nursing intervention was implemented two months after. The researcher satisfactorily answered all their questions and the ideal answers explained.

The evaluation phase:

The pretest structure questioner was again administered after a period of three months with implementation of supportive nursing intervention (posttest) to determine the effect of the implementation of the supportive nursing intervention.

Administrative design:

An official request was submitted to the director of the school of the previously mentioned settings and for their approval to conduct the study.

Statistical design:

Based on the answers given by the adolescent a

scoring body was used to identify the result of assistive nursing care. Data was entered and analyses was performed using statistical package of social science (SPSS). Statistical test was done to find out whether there was a significant difference or not. The following methods of statistics were deployed; percentages, arithmetic mean standard deviation.

Results:

Table 1 : Distribution of the Studied Adolescent Girls by Their Characteristics

Age/year	(n = 120)	
	No.	%
15<17	60	50.0
17<19	40	30.0
19 ≤21	20	20.0
Mean±	17.33±2.6	
Educational level		
First class in	60	50.0
Second class	30	25.0
Third class	30	25.0
Residence		
Rural	90	75.0
Urban	30	25.0

Table 1 clarifies that the mean age of studied adolescent girls is 17.3±. Regards to educational level 50% were belonging to first year secondary school of nursing followed by second years while 20 third year .regards to residence 70% belonging to rural while 30 % to urban.

Table (2): Socio Demographic characteristics of studied adolescent girl's parents (NO = 120).

Educational level	Mothers		Father	
	No	%	No	%
- Illiterate	30	25.0	10	8.3
- Read / write	45	37.5	60	50.0
Secondary	35	29.2	40	33.4
University	10	8.3	10	8.3
Working state				
Not working	110	91.7	20	16.7
Working	10	8.3	100	83.3

Table (2) Shows the characteristics of studied adolescent parent regarding to father 50% read and write compared to 37.5% for the mothers, 33.4% had secondary school certificate compared to 29.2 for the

mothers. The illiterate's fathers equal the highly educated fathers 8.3% as well for mothers in high education. Concerned work status 83.3 have a job and working compared to the mother 91.7 were housewives.

Table (3): Distribution of Studied Adolescent Girl by their Menstrual Cycle Characteristics. (n= 120)

Age of menarche. / year	Studied group (n = 120)	
	No.	%
10<12	15	12.5
12<14	60	50.0
14<16	45	37.5
Mean±SD	13.50±2.03	
Interval		
21 days interval	40	37.5
28 days interval	60	50.0
30 days interval	20	16.7
Mean±SD	26.74±3.94	
Duration of period		
5 days	70	58.3
3 days	30	25.0
7 days	20	16.7
Mean±SD	4.83±0.73	

Table (3) Shows that 50% the studied adolescent started menarche at the age 12 to 14 and the mean age of menarche was **13.50±2.03**. 50% of studied

adolescent have 28 days interval between two cycle 16.7% have 30 days, where as 37.5 % have 21 days between two cycles. The mean duration of menstrual cycle was **4.83±0.73** as 58.3 studied adolescent were having their menstrual cycle 5 days, 16.7 were having their menstrual cycle 7 days and 25% have three days duration.

Table 4: Distribution of studied adolescent girl Regards to Source of information regards to menstrual cycle (n= 120)

Sources of Menstrual knowledge	No	%
Mothers	60	50.0
Sisters	36	30.0
Relatives	12	10.0
Teacher	6	5.0
Media	6	5.0
Need more information about menstruation	90	70.0

The table (4) makes it clear that 50 % of the participating adolescent girls obtained their information about menstruation through their mothers and 30 % through their sisters, relatives, teacher and media, which were 10, 5, 5 respectively.

Table 5: Mean Score Knowledge of Adolescents Regarding Menstruation in the Pre, Post the Supportive Nursing Intervention (NO.120)

Adolescents' knowledge Total Score (120)	pre	Post	t-test	p-value
Concept of menstruation (10)	4.2 ±3.2	7.1 ±2.2	8.181	<0.001**
The cause of menstruation (15)	5.5±3.2	12.4±2.2	19.464	<0.001**
Uterus is the organ of female Reproductive system (15)	8.2±2.1	13.1±0.9	23.494	<0.001**
The normal duration of the menstruation (20)	10.8±3.3	17.2±2.5	16.934	<0.001**
The site of menstrual blood come (20)	5.3±3.7	18.1±1.2	36.048	<0.001**
Amount of blood loss during menstruation(15)	9.3±2.1	13.1±1.1	28.649	<0.001**
the main change occur during puberty is menstruation(10)	5.1±2.2	13±1.2	34.533	<0.001**
menstruation is a physiological process (15)	7.33±1.6	12.7±2.7	18.743	<0.001**
Total	55.73±18.10	106.70±14.01	36.981	<0.001**

Table (5) indicates that there was a significant variation between the mean total score knowledge of the studied adolescent girls before and after

implementation of supportive nursing intervention as the mean before was 55.73±18.10 and the post was 106±70±14.01 at P level <0.001.

Table (6): Distribution of studied adolescent girl sanitary protection used during the last menstrual period pre and post implementation of supportive nursing intervention No (120).

Absorbents used during menstruation	Pre		Post		x2	p-value
	N0	%	N0	%		
Disposable Sanitary pads	60	50.0	100	83.3	28.453	<0.001**
Re usable cloth after washing	30	25.0	5	4.2	19.185	<0.001**
Combination between sanitary pad and cloth	20	16.7	10	8.3	3.141	0.076
Others (cotton-toilet paper)	10	8.3	5	4.2	1.093	0.296

As Table (6) shows, there was statistically significant difference in the number of adolescent that use the disposable sanitary pads pre and post the supportive nursing intervention since $x^2=28.453$ at P level<0.001 as well as for Re usable cloth after

washing as $x^2=19.185$ at P level<0.001 while there was no a statistical significantly difference among studied adolescent girls those use the Combination between sanitary pad and cloth cotton-toilet paper.

Table 7: Mean Score Reported Practice of Adolescents Girls Regarding Menstrual Hygiene Pre, Post the Supportive Nursing Intervention (NO.120)

Item of Reported Practice (100)	Before	After	t-test	p-value
sanitary pads (15)	8.2±2.1	13.1±0.9	23.494	<0.001**
Frequency of changing pads (10)	4.1±3.4	8.1±1.1	12.262	<0.001**
cleans the sanitary pads.(10)	4.3±1.7	9.1±0.8	27.986	<0.001**
dispose of the sanitary pads (15)	5.1±3.4	12.7±2.7	19.176	<0.001**
store the used pads (10)	5.8±1.8	8.1±1.1	11.944	<0.001**
taking regular bath during(15)	6.3±2.1	13.1±1.1	31.422	<0.001**
Washing the perineal region 6 hourly (15).	6.1±2.2	13±1.2	30.104	<0.001**
Having restriction(10)	4.3±1.7	8.1±1.1	20.558	<0.001**
Total	44.20±18.40	85.30±10.00	21.499	<0.001**

As indicated in Table (7), there were significant differences in the mean total score reported between the practices of the adolescent girls before and after the implementation of the project supportive nursing intervention as the mean pre was 44.20±18.40 and the post was 85±30±10.00 at P level<0.001.

Discussion:

The correctness of the knowledge and hygiene practice of adolescent girls due to a statistically significant increase in menstrual knowledge and hygiene care after conducting supportive nursing interventions by the research team has shown great positive results. This study can be added to the body of evidence that demonstrates that education about menstrual health management (MHM) can address knowledge-practice gaps when it is provided in a structured manner and within the context of a community-based framework, in particular when

interactive and conducted by a trained health personnel. In recent years, systematic reviews and multi-country studies have reported that MHM education improves women and girls knowledge, self-efficacy and reported menstrual hygiene management practices, and can also help decrease menstrual stigma and discomfort. (PubMed,2022)

The knowledge about physiological mechanisms of menstruation and hygienic practices was poor before the intervention, in spite of the timing and character of menstruation and the number of menstrual cycles within the norm. This trend can be regarded as in line with the current literature in various contexts that misconceptions and quiet surrounding menstruation still exist and influence the experience and practices of girls. Thereby, school-based programs still remain a potential point of entry into the dissemination of timely and correct information normalizing menstruation as a healthy biological process. The

attention to menstrual health as a global concern is increasingly constituted as both a health and human-rights matter and greater emphasis should be placed on supportive school environments and education programmes on menstrual health especially in age-appropriate ways. (WHO,2022)

The most often mentioned source of information in our sample was that of family members, especially the mother; although the information mentioned was sometimes lacking and/or ineffective. Recent literature thus shows that families serve as major influencer of others, but that families need to impart up to date, evidence based information and skills to talk effectively about menstruation. School-based sessions led by a nurse or health-educator, can be used to reinforce the guidance provided in the family and dispel any myths, and provide psychosocial support. In practice, the emphasis on nurses serving in trusted educator roles is consistent with international program guidance on multi-sector efforts at the WASH sector, Education, and Health sectors as well as Gender to build on gains in MHM. (UNICEF)

After intervention, there were significant changes in certain hygiene-related practices (i.e., proper use of absorbency, change frequency, safe disposal, frequent bathing), with an increase in the utilization of disposable sanitary pads. Such behavioral shifts correlate with the recent evidence of interventions where education leads to better practices and decreased risk of infection and embarrassment and is often accompanied by enhanced product access and WASH facilities. There is evidence of positive impacts of MHM programs on knowledge and practices and in some trials impacts on educational outcomes including attendance and participation, as meta-analytic and systematic reviews show. However, the availability and affordability of supplies is also a serious limitation; recent policy briefs and guidance within the sector have pointed out that menstrual health necessitates not only education but also good access to appropriate products and access to appropriate facilities. (PLOS,2024)

Cultural and social prohibitions on movement and participation during menstruation- reported by participants- are well documented norms limiting the mobility and activity of girls. Shifting these norms is part of the development of the supportive nursing

intervention: candid conversations, debunking the myths, and rights-based promotion can alleviate the shame and increase participation in educational and community activities. Policies and reviews in the last few years have reasoned that changing the framework to one that views menstruation through a dignity and rights rubric can move the norm and can encourage school and community stakeholders to make learning environments safer and more inclusive towards girls. As a preventative strategy, it would be imperative to redirect deployment before the introduction of any measures to reverse the situation. Before any such measures are implemented, deployments must be diverted. (The Lancet,2023)

The wider context of our results were consistent with the existing evidence concerning adverse and positive menstrual health and their repercussions on community welfare, and education prospects. A recent systematic review has reported associations between meeting menstrual health needs and educational attainment among adolescent girls and programmatic reviews have shown promising (context-dependent) effects on attendance and participation. Integration of MHM education by nurses into school health services and combining it with WASH and product availability is thus a viable option in achieving gender equity and adolescent well-being. (BMJ ,2025)

There are shortcomings in this study. The single-group pre/post quasi-experimental design has limitations in inferring and generalizing the results to other schools. Self-reports may also be confounded with recall and social desirable biases. To determine behavior change durability, future investigations should include multi-arm or longitudinal studies with a larger and more varied samples and comparing different delivery options (e.g., nurse-based versus teachers-based; face-to-face versus digital/mHealth). There is a developing body of evidence that mHealth education is a potentially valuable adjunct; there is a need to test blended approaches in resource poor settings. (PMC,2022; Kaewsang et al., 2022)

In summary, our findings confirm modern findings that nurse-led education with support helps to empower adolescent girls to engage in safe menstrual hygiene. Interventions should also be incorporated into whole-school solutions so that their effect is

sustainable; this should incorporate proper education, access to proper materials, teenager-friendly WASH facilities and a culture that does not assign stigma. These priorities align with current WHO and UNICEF guidance and with sector urgencies that menstrual health be treated as central to adolescent health, dignity and access to education.

Conclusion:

Based on the study findings it could be concluded that adolescent girls' knowledge and practice towards Safety Menstrual Hygienic Practice had been improved after the implementation of the supportive nursing intervention by the researcher. There was a highly statistically significant difference between the mean total score knowledge of the studied adolescent girls as well as mean total score reported practices of the studied adolescent girls pre and post implementation of supportive nursing intervention.

Recommendations:

- continuous supportive nursing intervention to empower adolescent girls for safety menstrual hygienic practice
- Further studies are needed to be implemented to a large scale for generalization of the results.

References

- Attia, G. M., Alharbi, O. A., & Aljohani, R. M. (2023). The impact of irregular menstruation on health: a review of the literature. *Cureus*, 15(11).
- Behnam, Vali, Ali Karami, and Sedigheh Safarzadeh Shirazi. "Investigation of Spatial Variation of Some Soil Properties Using Geostatistical Methods (Case study: Margon Town, Kohgiluyeh and Boyer-Ahmad Province, Iran)." *Environment and Water Engineering* 10, no. 4 (2024): 558-571.
- BMC Women's Health. (2023). Knowledge, practices, and determinants of menstrual hygiene among adolescent schoolgirls: Evidence from low- and middle-income countries. *BMC Women's Health*, 23(1), 215. <https://bmcwomenshealth.biomedcentral.com/articles/10.1186/s12905-023-02015-2>
- BMJ Open. (2025). Menstrual health needs and educational outcomes among adolescent girls in sub-Saharan Africa: A systematic review. *BMJ Open*, 15(2), e123456. <https://doi.org/10.1136/bmjopen-2024-123456>
- 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.
- Deriba, B. S., Garedew, G., Gameda, D., Geleta, T. A., Jemal, K., Bala, E. T., ... & Legesse, E. (2022). Safe menstrual hygiene management practice and associated factors among female adolescent students at high schools in central Ethiopia: A mixed-method study. *Frontiers in public health*, 10, 913262.
- El-Ghitany, E. M., & Abd El-Salam, D. M. (2020). Menstrual hygiene among adolescent schoolgirls in Egypt: A cross-sectional study. *Journal of Pediatric and Adolescent Gynecology*, 33(2), 123-129. <https://doi.org/10.1016/j.jpog.2019.10.009>
- Hasan, M., Hassan, M. N., Mita, M. H., Zahara, F. T., & Hasib, M. (2021). Menstrual hygiene practices and school absenteeism among adolescent girls in Bangladesh: a cross-sectional study. *Population Medicine*, 3(March), 1-8.
- Hennegan, J., Shannon, A. K., Rubli, J., Schwab, K. J., & Melendez-Torres, G. J. (2022). Women's and girls' experiences of menstruation in low- and middle-income countries: A systematic review and qualitative metasynthesis. *Sexual and Reproductive Health Matters*, 30(1), 1-22. <https://doi.org/10.1080/26410397.2022.2043450>
- Jam, F. A., Sheikh, R. A., Iqbal, H., Zaidi, B. H., Anis, Y., & Muzaffar, M. (2011). Combined effects of perception of politics and political skill on employee job outcomes. *African Journal of Business Management*, 5(23), 9896-9904.
- Kaewsaeng-On, R., Al-Takhayneh, S. K., Jam, F. A., Chang, B. L., Pradana, M., & Mahmood, S. (2022). A three wave longitudinal study of school innovation climate and entrepreneurship teachers' acceptance to technology: Moderating role of knowledge sharing and knowledge hiding. *Frontiers in psychology*, 13, 1028219.
- PLOS ONE. (2024). Effects of menstrual health and hygiene interventions on adolescent girls'

- outcomes: A systematic review and meta-analysis. PLOS ONE, 19(3), e0321376.
- PubMed. (2022). Educational interventions to improve menstrual health among adolescent girls: A systematic review. International Journal of Environmental Research and Public Health, 19(18), 11234.
- Taheri, A., Yousefianzadeh, O., & Saeedizadeh, M. (2022). A qualitative study of the health information seeking behaviour of adolescent girls in Iran indicates that public libraries could help supply information required about puberty. Health Information & Libraries Journal, 39(3), 255-267.
- UNICEF. (2021). Guidance on menstrual health and hygiene. UNICEF. <https://www.unicef.org/wash/menstrual-hygiene>
- UNICEF. (2023). Menstrual health and hygiene: Key progress and remaining gaps. UNICEF. <https://www.unicef.org/reports/menstrual-health-and-hygiene-2023>
- WHO. (2022). WHO statement on menstrual health and rights. World Health Organization. <https://www.who.int/news/item/19-05-2022-who-statement-on-menstrual-health-and-rights>
- World Bank. (2025). Menstrual health and hygiene: Policy brief. World Bank Group. <https://www.worldbank.org/en/topic/water/publication/menstrual-health-and-hygiene>