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Effectiveness Of The School Based Menstrual Education Program (SBMEP) In Terms Of Knowledge And Practice Regarding Menstrual Health And Hygiene Among Adolescent Girls Of Selected Schools.

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Abstract:
Background*: Menstrual health and hygiene are crucial for the well-being of adolescent girls. However, various cultural taboos, misinformation, and lack of proper education contribute to poor menstrual hygiene practices. School-Based Menstrual Education Programs (SBMEP) aim to enhance knowledge and practice regarding menstrual health and hygiene among adolescent girls.*
Aim: *This study evaluates the effectiveness of SBMEP in improving knowledge and practice related to menstrual health among adolescent girls in selected schools in Lucknow, Uttar Pradesh.*
Methods: *A pre-experimental one-group pre-test and post-test research design was used. The study included 100 adolescent girls aged 12–18 years from Kendriya Vidyalaya, SGPGIMS, Lucknow. A structured questionnaire assessed knowledge and practice before and after the educational intervention. Data analysis was conducted using descriptive and inferential statistics.*
Results: *The mean pre-test knowledge score was 4.54 (±0.85), while the mean post-test score significantly increased to 9.01 (±0.58), indicating improved knowledge. Similarly, menstrual hygiene practices showed a substantial improvement post-intervention.*
Conclusion: *The findings suggest that SBMEP is an effective strategy to enhance menstrual health awareness and hygiene practices among adolescent girls. Implementing similar programs in schools can contribute to better reproductive health and overall well-being.*
Keywords: *Menstrual hygiene, School Based Menstrual Education Program, sanitation, menarche, adolescent girls.*

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I. Introduction

Adolescence represents a crucial transitional phase between childhood and adulthood, spanning ages 10 to 19 years. India has the world's largest adolescent population, with approximately 243 million individuals in this age group (Adolescent health 2021). This developmental stage is characterized by significant physical, cognitive, and psychosocial changes. Adolescent girls deserve particular attention due to their unique vulnerabilities. The onset of menstruation marks a new phase, bringing new vulnerabilities for adolescents. Many adolescent girls experience stigma, harassment, and social exclusion during menstruation. Additionally, due to gender identity the transgender men and non-binary persons encounter discrimination it depriving them of access to the materials and facilities they need (UNICEF, 2019). Studies indicate that millions of girls face substantial barriers to maintaining proper menstrual hygiene and health (Omidvar S, Begum K 2010).

In India, it has been reported that about 77% of menstruating girls use old cloth as absorbents, while 88% resort to unsafe alternatives such as ashes, newspapers, and dried leaves. These practices, combined with inadequate washing facilities and social stigma, increase their susceptibility to infections and negatively impact their overall health and well-being (Jogdand K, Yerpude P.2011 ,Garg et al., 2011).

Menstruation is a natural physiological process experienced by approximately 1.8 billion people globally. Despite its significance, millions of adolescents' girls, women, transgender men, and non-binary persons face challenges to manage their menstrual cycle in a dignified and healthy manner. Menstrual health and hygiene remain critical challenges, especially for adolescent girls in India, where approximately 355 million

females menstruate (UNICEF, 2019). Despite significant advancements in healthcare and education, several barriers continue to hamper the menstrual health management. These challenges include inadequate knowledge, cultural taboos, and limited access to sanitary products, water and private spaces often lead to improper menstrual hygiene practices, school absenteeism, and increased susceptibility to infections, inversely impacting the overall health and well-being and academic performance it leads to adverse health and reproductive outcomes. (UNICEF, 2019, Kansal, Singh, & Kumar, 2016).

Menstrual hygiene management (MHM) is crucial and there are visible barriers such as gender inequality, discriminatory social norms, cultural taboos, poverty, and inadequate basic services, such as toilets and sanitary products, prevent many from meeting their menstrual hygiene needs. Studies show that approximately 77% of menstruating girls in India rely on old cloth as absorbents, while 88% resort to unsafe alternatives such as ashes and newspapers (Das et al., 2015). In Uttar Pradesh, home to a female population of 9.78 million, menstrual hygiene awareness is particularly low among school-going adolescents (Census of India, 2011). A descriptive study on knowledge of the adolescence girls regarding menstrual hygiene indicated that a significant proportion (only 25%) of adolescent girls possess inadequate knowledge about menstruation, menarche, and menstrual hygiene which leads to unhygienic practices that may result in health complications such as reproductive tract infections (RTIs), Ruchi, Fartha Azmi (2016).

Perception and awareness of menstrual hygiene among female college students in Jhajjar, Haryana. Design: Questionnaire based survey study. Method: The study sample consisted of 300 subjects. The subjects were selected as per the inclusive criteria and information was provided to the subjects. most of the females have proper knowledge regarding sanitary material. A majority of females re-change their sanitary material more than twice. Whereas washing hands and cleanliness practices were found to be unsatisfactory. Conclusion: From the result of this study we have concluded that females have proper knowledge about sanitary material but they dont have enough knowledge about washing and cleaning habits due to which they can be vulnerable toward many infections and diseases (Ayasha Jhajjaria, Jitin Kumar , 2024).

India has the largest adolescent population in the world, with approximately 243 million individuals aged 10–19 years (UNICEF, 2019). Uttar Pradesh, India's most populous state, had a population of 23.57 crore in the 2011 census, with 9.78 million females (Census of India, 2011). Lucknow, the state capital, had a female population of 1,356,135. Despite rapid urbanization, menstrual hygiene awareness and practices remain suboptimal, particularly among adolescent girls in schools (Garg et al., 2011).

In Tamil Nadu, Coimbatore-based social entrepreneur Arunachalam Muruganantham created an inexpensive sanitary pad manufacturing equipment. Through his devices, he revolutionized menstruation hygiene for women in rural India. He effectively distributes affordable sanitary pads to 4,000 Indian communities. Muruganantham created a four-step process for producing sanitary towels through the innovative use of existing simple tools and technologies. The lack of proper menstrual health education in schools has a profound impact on adolescent girls. Limited awareness about menstruation before menarche often results in fear, anxiety, and misconceptions (Patle & Kubde, 2014). Implementing school-based menstrual health education programs can improve knowledge and hygiene practices, ultimately contributing to better health outcomes and reducing school absenteeism due to menstruation-related issues (Paul et al., 2020).

Moreover, menstrual hygiene is a public health concern that requires urgent attention. Given the widespread gaps in menstrual health education, implementing school-based menstrual education programs (SBMEP) is crucial. Such programs aim to provide accurate information, improve hygiene practices, and eliminate myths and misconceptions surrounding menstruation. Hence, the aim of the study was highlights the necessity to evaluate the effectiveness of school-based teaching programme on knowledge and practice regarding menstrual health among adolescent girls in selected schools at Lucknow.

The objectives of the study are to:

1) Assess the Pre-test and post-test knowledge and practice regarding menstrual health and hygiene among adolescent girls.
2) Evaluate the effectiveness of School Based Menstrual Education Program (SBMEP) in terms of knowledge and practice of adolescent girls.
3) Associate between the pre-test knowledge scores of regarding menstrual health and hygiene with selected demographic variables adolescent girls.
4) Associate between the pre-test practice scores of regarding menstrual health and hygiene with selected demographic variables adolescent girls.

II. Materials And Methodology

Research Design: This study employed a Quantitative, Pre-experimental (one-group pre-test post-test) design, conducted among adolescent girls aged 11 to 17 years studying in Kendriya Vidyalaya, SGPGIMS, Lucknow, from 03/09/2024 to 15/09/2024.

Study settings, Population and Sample, sample size: Target Population: 100 Adolescent girls aged 12 to 18 years studying in Kendriya Vidyalaya, SGPGIMS, Lucknow were selected as participants of this study through total enumeration (convenient sampling).

Sampling Criteria:
Inclusion Criteria:
1. Adolescent girls willing to participate.
2. Adolescent girls who have attained menarche.
3. Adolescent girls aged between 12-18 years.

Exclusion Criteria:
4. Adolescent girls unwilling to participate.
5. Adolescent girls unavailable during data collection.

Tools Used in the Study:
- **Section A:** Demographic data questionnaire.
- **Section B:** Structured knowledge questionnaire regarding menstrual health and hygiene (10 questions).
- **Section C:** Menstrual practice questionnaire (standardized tool containing 16 questions).

Ethical Considerations: Prior to data collection, the necessary permissions were obtained from the DRC College of Nursing and IEC SGPGIMS (IEC code: 2024-6-BSc CON-5; PGI/BE/309/2024, Dated 14/10/2024). Informed consent was obtained from participants, and oral assent was secured from adolescents alongside written consent from parents/guardians through respective class teachers.

Duration: The average time taken for data collection was between 20 to 30 minutes for each participant

Intervention: A structured health education intervention on menstrual health and hygiene (SBMEP) was developed. The session consists 45 minutes – one hour involved interactive learning through PowerPoint presentations, placards, posters, videos, and detailed handouts. Key topics included hygiene practices, the safe disposal of menstrual products, and an overview of various absorbents like tampons and menstrual cups. Group discussions aimed to dispel myths related to menstruation. The intervention was evaluated and validated by experts in gynecology and community medicine.

Data Collection: Data collection followed these steps:
1. IEC permission was obtained from SGPGIMS, Lucknow, and the study was registered with CTRI.
2. Informed consent was taken from each participant, explaining the study's purpose.
3. Participants were selected via simple random sampling.
4. Data were collected using demographic and self-structured knowledge and practice-based questionnaires.
5. The average time for data collection was 20-30 minutes per participant, occurring between 03/09/2024 and 15/09/2024.

Data Analysis:

The collected data were entered and analyzed using Microsoft Excel (2010). Statistical analysis was performed using the Chi-square test to assess the relationship between demographic variables and pre-test scores. A significance threshold of $p < 0.05$ was applied.

III. Results And Analysis

Section 1: Socio-Demographic Data Distribution of Adolescent Girls on Menstrual Health and Hygiene

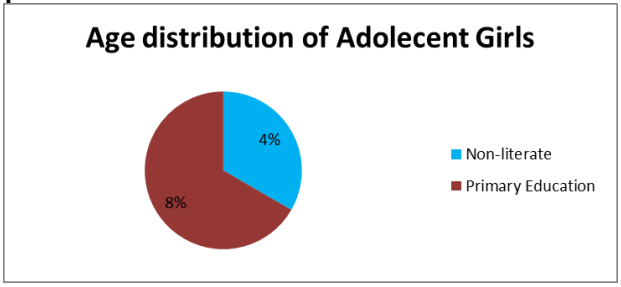

Figure 1: A majority of adolescent girls, 68 (68%), were in within the age group of 13–15 years, while 32% were in the 16–18 age range.

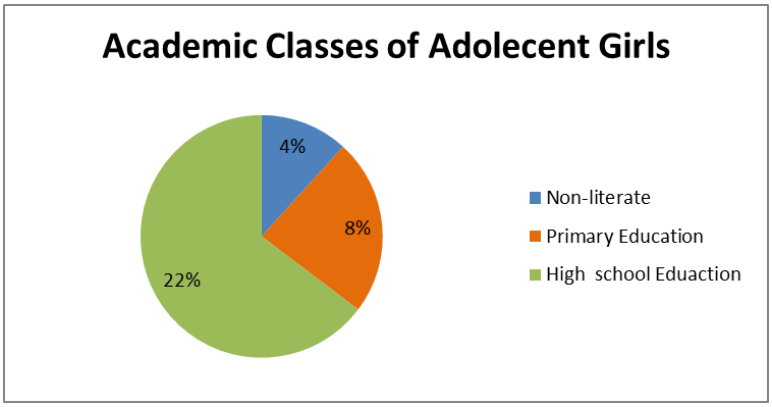

Figure 2: Regarding their academic classes of the participants, 38 (38%), were in 9th grade, followed by 32% in 10th grade, and 30% in 11th grade.

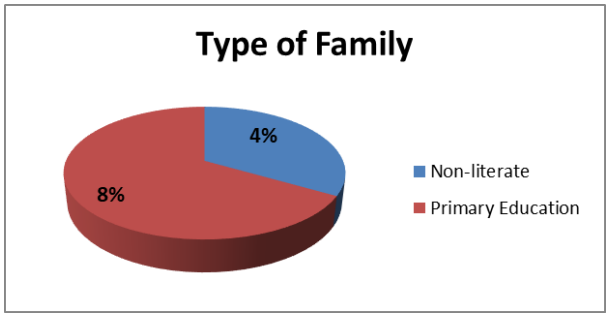

Figure 3: Pie diagram showing Family of Adolescent girls, 65% of the participants belonged to nuclear families, and the remaining 35% came from joint families.

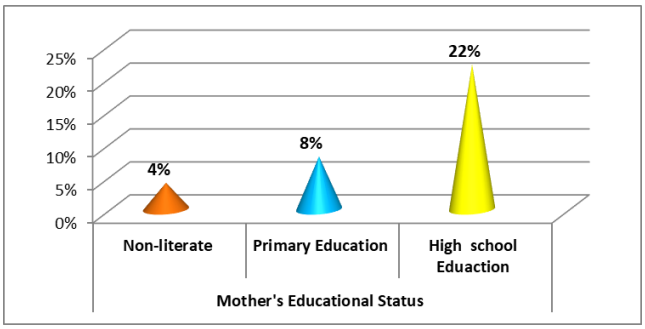

Figure 4: Family Monthly Income of Adolescent girls: A significant proportion, 64%, reported a family monthly income of ₹20,001 or above. Around 22% had an income between ₹8,001–₹15,000, and 14% fell in the ₹15,001–₹20,000 range.

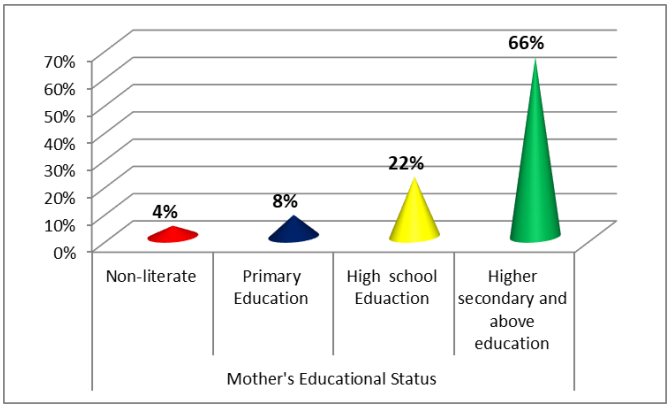

Figure 5: Mother's Educational Status Mothers of most participants (66%) were educated to higher secondary and above. About 22% had a high school education, 8% attended primary school, and 4% were illiterate.

SECTION 2: Analysis of level of Pre-test knowledge of Adolescent girls regarding Menstrual Health and Hygiene.

Table no. 2: Pre-test and post-test knowledge level- percentage, Mean, Median, SD of adolescent girls.

Level of knowledge	Poor knowledge (0-2)	Inadequate knowledge (3-5)	Adequate knowledge (6-8)	Good knowledge (9-10)	Mean	SD
Pre test	4%	88%	8%	0%	4.54	0.85
Post test	0%	0%	16%	84%	9.01	0.58

Post-test knowledge scores (Mean = 9.01) were notably higher than pre-test scores (Mean = 4.54), reflecting substantial improvement. Furthermore, the lower post-test SD (0.58) indicates a more consistent understanding after the educational intervention.

Table no. 3: Pre-test and post-test practice level- percentage, Mean, Median, SD of adolescent girls.

Level of Practice	Poor practice (0-9)	Good practice (10-17)	Mean	Median	SD
Pre test	**95%**	**5%**	**6.65**	**7**	**1.35**
Post test	**0%**	**84%**	**14.86**	**15**	**0.43**

Table 4: Mean, Median, Standard deviation, Standard error mean, t-value, p-value, df of pre-test and post-test knowledge scores of mensural health and hygiene among adolescent girls. (n=100)

S.NO	Knowledge Test	Mean	Standard Deviation	Standard error mean	t value	p value	Df
1	**Pre-test**	4.54	0.857	0.085	47.168	0.000	99
2	**Post-test**	9.01	0.577	0.057			

MAXIMUM POSSIBLE SCORE=10

The post-test knowledge scores (Mean = 9.01, SD = 0.577) were substantially higher than pre-test scores (Mean = 4.54, SD = 0.857). The t-value (47.168) and p-value (0.000) indicate the results are statistically significant, affirming the effectiveness of the intervention. The t-value (47.168) and p-value (<0.001) indicate a highly significant improvement in knowledge after the educational program. The reduction in the standard error mean from 0.085 (pre-test) to 0.057 (post-test) suggests a more precise estimation of the population mean.

Table 5: Mean, Median, Standard deviation, Standard error mean, t-value, p-value, df of pre-test and post-test practice scores of mensural health and hygiene among adolescent girls. (n=100)

S.NO	Practice Test	Mean	Standard Deviation	SD error mean	t value	p value	Df
1	**Pre-test**	6.65	1.35	0.135	54.5	0.000	99
2	**Post-test**	14.86	0.43	0.042			

Post-test scores (Mean = 14.86, SD = 0.43) were significantly improved compared to pre-test scores (Mean = 6.65, SD = 1.35). The t-value (54.5) and p-value (0.000) further support the intervention's success in improving menstrual health practices. A significant improvement in practice scores was observed post-intervention, with a t-value of 54.5 and a p-value < 0.001.

Table 6 Chi square value showing association between Pre- test knowledge scores with the selected factors of adolescent girls.

	ASSOCIATED FACTORS	KNOWLEDGE SCORES						
S.NO		Good Knowledge	Adequate Knowledge	Inadequate knowledge	Poor knowledge	Chi square	df	P value
1	**AGE**							
1.1	10-12 yr	0	0	0	0			
1.2	13-15	0	6	61	3			
1.3	16-18	0	2	29	1			
1.4	19-20	0	0	0	0	**0.307**	**2**	**0.885**
2	**CLASS**							
2.1	9th	0	3	33	2			
2.2	10th	0	3	28	1			
2.3	11th	0	2	27	1	**0.409**	**4**	**0.999**
3	**FAMILY**							
3.1	Nuclear	0	6	59	0			
3.2	Joint	0	2	29	4	**7.942**	**2**	**0.017**
4	**FAMILY MONTHLY INCOME**							
4.1	<8000	0	0	0	0			
4.2	8001-15000	0	2	20	0			
4.3	15001-20000	0	0	14	0			
4.4	20001 and above	0	6	54	4	**3.965**	**4**	**0.397**
5	**EDUCATIONAL STATUS OF MOTHER**							
5.1	Illiterate	0	0	4	0			
5.2	Primary School	0	0	8	0			
5.3	High School	0	0	22	0			
5.4	Intermediate and above	0	8	54	4	**7.025**	**6**	**0.287**

The Chi-square test revealed no significant relationship between knowledge scores and socio-demographic variables such as age, class, family income, or mother's education. However, a significant association was observed with family type ($\chi^2 = 7.942$). The findings indicate that family type was significantly associated with pre-test knowledge scores, while other factors such as age, class, family income, and maternal education did not show significant associations.

Table 7: Association between Pre-test practice scores with the selected factors of adolescent girls. (n=100)

S.no	ASSOCIATED FACTORS	Practice score		Chi square	df	P value
		Good practice (10-17)	Poor practice (0-9)			
1	**Age**					
1.1	10-12 yr	0	0			
1.2	13-15	3	65			
1.3	16-18	2	30			
1.4	19-20	0	0	0.155	1	0.999
2	**Class**					
2.1	9th	1	37			
2.2	10th	2	37			
2.3	11th	2	28	0.729	2	0.731
3	**Type of family**					
3.1	Nuclear	3	62			
3.2	Joint	2	33	0.058	1	0.999
4	**Family monthly income**					
4.1	<8000	0	0			
4.2	8001-15000	0	22			
4.3	15001-20000	1	13			
4.4	20001 and above	4	59	1.52	2	0.429
5	**Educational status of mother**					
5.1	Illiterate	0	4			
5.2	Primary School	0	8			
5.3	High School	2	20			
5.4	Intermediate and above	3	63	1.435	3	0.682

The association between socio demographic data and level of Practice was done by chi square value comparing socio demographic data no significant correlation was found between practice scores and demographic factors such as age (χ^2 = 0.155), class (χ^2 = 0.729), family income (χ^2 = 1.52), or mother's education (χ^2 = 1.435). The results indicate no significant association between pre-test practice scores and demographic factors, suggesting that practice levels were independent of socio-demographic variables in this study population.

IV. Discussion

The present study evaluated the effectiveness of a School-Based Menstrual Education Program (SBMEP) on knowledge and practices related to menstrual health among adolescent girls in Kendriya Vidyalaya, SGPGIMS, Lucknow. The findings highlight significant improvements in both knowledge and practice following the intervention, demonstrating the effectiveness of structured educational initiatives in enhancing menstrual health awareness.

1. Demographic Variables

A majority of adolescent girls (68, 68%) were within the 13–15 years age group, while 32% belonged to the 16–18 years age group. This aligns with previous research indicating that early adolescence is a critical period for developing knowledge about menstrual health (Parasuraman et al., 2022), a total of 250 adolescent girls were included in the study belonging with the mean age of 13.29 ± 1.5 years. Most participants were in 9th grade (38%), which suggests that early educational interventions may be beneficial during this formative period. Mothers of most of the participants were housewives [112 (45%)] followed by laborers [100 (40%)]. (Parasuraman G, Vijay V, Balaji S, Nisha B, Dutta R, Jain T, et al. Impact of health education intervention on menstruation and its hygiene among urban school-going adolescent girls in Thiruvallur, Tamilnadu. J Family Med Prim Care 2022;11:5271-6.). Regarding family structure of participants showed that 65% were from nuclear families, while 35% were from joint families. This demographic aspect is significant because family dynamics can influence health education and the dissemination of knowledge, particularly regarding sensitive topics such as menstruation (Thakur et al., 2014). In the present study the educational background of mothers was predominantly intermediate and above (66%), indicating that maternal education may contribute positively to the menstrual health knowledge of daughters, as supported by findings from previous studies (Kansal et al., 2016).

Level of Knowledge Assessment of menstrual hygiene and health:

The pre-test findings revealed that 88% of participants had inadequate knowledge regarding menstrual health, with only 8% demonstrating adequate knowledge. These results are consistent with studies by Das et al. (2015) and Kansal et al. (2016), which indicated that a majority of adolescent girls in India lacked sufficient knowledge about menstruation before receiving formal education on the subject.

Post-intervention, the mean knowledge score significantly increased from 4.54 to 9.01 ($p<0.001$), indicating a substantial improvement. This finding is in line with studies by Paul et al. (2020) and Bansal & Banerjee (2021), which reported that educational programs can effectively enhance menstrual knowledge among schoolgirls. The structured nature of the SBMEP likely facilitated this learning by providing accurate information and dispelling common myths surrounding menstruation.

Practice Assessment

The pre-test practice assessment revealed that 95% of participants had poor menstrual hygiene practices, while only 5% demonstrated good practices. This finding aligns with Garg et al. (2011), which highlighted the widespread use of unsafe menstrual absorbents among adolescent girls in India. Following the implementation of SBMEP, there was a remarkable improvement in menstrual hygiene practices, with the mean practice score rising from 6.65 to 14.86 ($p<0.001$). This significant change reinforces the findings of Dasgupta & Sarkar (2008) and Bansal & Banerjee (2021), which emphasized the effectiveness of school-based interventions in improving menstrual hygiene behaviors.

Association with Demographic Variables

The study also examined the association between socio-demographic factors and pre-test knowledge and practice scores. While demographic variables such as age, class, and family income did not show significant associations with menstrual knowledge, family type exhibited a significant correlation ($p<0.05$). This aligns with research by Thakur et al. (2014), which suggested that family support and parental education significantly influence menstrual health awareness.

Implications for Public Health and Policy

The findings of this study underscore the urgent need for comprehensive menstrual health education programs in schools. Introducing structured SBMEPs can help dispel myths and improve hygiene practices, ultimately reducing the risk of infections and menstrual-related absenteeism. Policymakers and educators should integrate menstrual health education into school curricula to ensure sustained awareness and improved health outcomes.

Limitations of the Study

While this study provides valuable insights into the impact of menstrual health education, certain limitations must be acknowledged. The study was conducted in a single school, limiting its generalizability to a broader population. Additionally, self-reported data on menstrual practices may be subject to response bias, which could affect the accuracy of the findings.

V. Conclusion

The study demonstrates that school-based menstrual health education programs can significantly enhance knowledge and hygiene practices among adolescent girls. Implementing similar interventions on a larger scale can contribute to improved menstrual health outcomes and overall well-being. Future research should focus on longitudinal studies to assess the long-term impact of menstrual health education on adolescent girls.

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