

Assessment of Menstrual Hygiene Management Among Karamojong Adolescent Girls in Rupa Sub-County, Moroto District

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Public Health Significance

In Uganda, 84% (3.75 million) of adolescent girls living in rural settings practice unsafe menstrual hygiene management (SNV, 2014). This is mostly attributed to limited access to appropriate menstrual products. Many of the adolescent girls rely on crude methods like old clothing, pieces of foam mattress, toilet papers, leaves, and banana fibers to manage their menstruation. If the situation is not addressed the adolescent girls will have increased vulnerability to reproductive tract infections (RTI), increased rate of school drop outs, absenteeism and stigmatization.

Abstract

Background: Menstrual hygiene and management is insufficiently acknowledged since it has not received adequate attention, in most cases because it is considered a private issue that's rarely open to discussion making it difficult for girls to manage their periods. This leaves them at high risk of contracting diseases related to poor menstrual management.

Methods: A cross-sectional study involving both quantitative and qualitative data collection techniques was conducted in Rupa Sub-County, Moroto district between August and October 2016 and a total of 133 adolescent girls were interviewed. Descriptive statistics, Chi-square and Odd ratios tests were used for analysis to assess the menstrual hygiene management.

Results: Mean age of respondents was 17.03±2.121 years; respondents going to school were 5.9 times more likely to practice safe menstrual hygiene management (p-value 0.000), half (50.4%) of the adolescent girls had no education (p-value 0.000), 38.3 % of the girls did not know what to do during menstruation (p-value 0.000), respondents who agreed that it is ideal to bath at least twice during menstruation were 2.9 times more likely to practice safe menstrual hygiene management (p-value-0.024), less than half (28.6%) of the respondents were not sure whether it is hygienic to use material for less than 6 hours during menstruation (p-value 0.000), while slightly three quarters (61.7%) of adolescent girls used old rags during menstruation, 48.1% of the respondents agreed that there are cultural factors attached to menstrual hygiene management (0.000).

Conclusion: Menstrual hygiene management is still a very big challenge among adolescent girls in Moroto district; various factors were identified to affect menstrual behaviors most influential being lack of adequate knowledge, Socio-economic status of participants and cultural factors.

Keywords: Adolescent, Menarche, Menstruation, Menstrual hygiene, Taboos, Safe menstrual & unsafe menstrual practices.

Introduction

Menstrual practices are affected by taboos and socio-cultural limitations in developing countries especially Uganda, resulting in adolescent girls remaining ignorant of the scientific facts and hygienic health practices necessary for maintaining positive reproductive health. Hygiene related practices of women and adolescent girls during menstruation are of considerable importance as it has a health impact in terms of increased vulnerability to infection. In Uganda, menstruation in most cases is considered as a private issue and is not regularly talked about openly making it difficult for girls to manage their periods. Many Recovery programs like Peace Recovery and Development Program (PRDP) have focused on education sector classrooms and hospital constructions where sanitation is considered; Menstrual hygiene is not given the due attention it requires. The Ugandan government has not done much in promoting menstrual hygiene management in many districts in the country (Jessica, 2006). An estimated 66% of adolescent girls in Uganda have no prior knowledge on the menstruation cycle of a woman until they start their menses, which contributes to a traumatic experience for their first menstrual periods (Mooijman, 2010). The lack of adequate knowledge and skills for menstrual hygiene management can have negative impact to school attendance, quality of life and enjoyment of learning for girls. A research carried out to Map the Menstrual Hygiene Management in Uganda, showed that at least 84% of adolescents living in rural settings are unable to sufficiently access and/or afford sanitary pads. Moroto district is not exceptional it is faced with the same or even worse challenges like other rural settings in Uganda.

Methods and materials

Population

This study was conducted in Rupa Sub-County Moroto district among girls aged 13-20 years in Karamoja sub-region because of the socio-economic conditions present in the area.

Study Design and sampling procedures

A cross sectional study design was employed to capture data from 133 respondents estimated using Kish & Leslie formula. Participants were selected using multi-stage sampling. 5 villages were randomly selected using a lottery method from a list of all the 27 villages. At the second stage a list of all the households in the selected villages was used as a sampling frame to systematically select households with adolescent girls.

Data collection and management

A researcher administered questionnaire and a focus group discussion guide were used to gather data on characteristics of adolescent girls, socio-economic and cultural factors related to menstrual hygiene practices.

Ethical considerations International Health Sciences University Research Ethics Committee approved the study and consent was obtained from the adolescent girls over 18 years while those below 18 years, ascent was sought.

Results

The study was conducted in Rupa sub-county Moroto district and the total number of participants who participated in the study was 133, thus making a response rate of 100%. A vast majority 72.93% (97/133) of adolescent in the study area practiced unsafe menstrual hygiene management and 27.07% practiced safe menstrual hygiene management.

Bivariate analysis

Table 1 below reveals that age was found to statistically influence the menstrual hygiene management among the study respondents ($X^2=8.404$) with a P-value of 0.004. There was statistical relationship between going to school and menstrual hygiene management ($X^2=18.957$ and P-value 0.000). Employment status ($X^2=1.086$, P-value=0.285, person who stays with the adolescent ($X^2=1.665$, P-value=0.797) and whether parents are alive ($X^2=5.109$, P=0.078) did not influence menstrual hygiene management.

Table 1: Characteristics of Respondents influencing menstrual hygiene management

Variable	Menstrual hygiene management				Total	X ²	P-value
	Unsafe		Safe				
	Frequency (N=133)	Percent (%)	Frequency (N=133)	Percent (%)			
Age (years)							
13-16	51	38.3	9	6.8	60	8.404	0.004**
17-20	46	34.6	27	20.3	73		
School going							
Yes	70	52.6	11	8.3	81	18.957	0.000**
No	27	20.3	25	18.8	52		
Employment status (N=81)							
Employed	55	41.4	7	8.6	62	1.086	0.285
Unemployed	15	18.5	4	4.9	19		
Staying with who (N=133)							
Parents/biological	21	15.8	5	3.8	26	1.665	0.797
Grandparents	4	3.0	1	0.8	5		
Relatives	20	15.0	8	6.0	28		
Guardian	52	39.1	22	16.5	74		
Other	0	0.0	0	0.0	0		
Parents alive							
Both parents alive	15	11.3	1	0.8	16	5.109	0.078
One parent alive	32	24.1	13	9.8	45		
Both parents dead	50	37.6	22	16.5	72		

**=Statistically significant $P < 0.05$

Socio-Economic factors associated with menstrual hygiene

From table 2, the level of education influenced menstrual hygiene management ($X^2=31.151$, P-value=0.000). Knowledge of respondents on menstruation significantly influenced menstrual hygiene management with chi-square of 13.860 and P-value=0.000. The study also found out that bathing at least twice a day during menstruation influenced menstrual hygiene management ($X^2=6.103$, P-value=0.047) and the use of material for not more than 6 hours during menstruation influenced menstrual hygiene management ($X^2=33.520$, P-value=0.000). While the sources of information ($X^2=7.512$, P-value=0.111), parent's employment status ($X^2=0.400$, P-value=0.819) and whether there are complications during menstruation ($X^2= 0.110$, P-value=0.946)

did not have any influence on safe menstrual management.

Table 2: Socio-economic factors influencing menstrual hygiene management

Variable	Menstrual hygiene management				Total	X ²	P-value
	Unsafe		Safe				
	Frequency (N=133)	Percentage (%)	Frequency (N=133)	Percentage (%)			
Level of education							
None	67	50.4	10	7.5	77	31.151	0.000**
Primary	4	3.0	1	0.8	5		
Secondary	21	15.8	9	6.8	30		
Tertiary	5	3.8	16	12.0	21		
Do you know what to do during menstruation?							
Yes	46	34.6	5	3.8	51	13.860	0.000**
No	51	38.3	31	23.3	82		
Source of information on menstruation							
Parents	7	5.3	1	0.8	8	7.512	0.111
Teachers	15	11.3	4	3.0	19		
Friends/Peers	54	40.6	15	11.3	69		
Media	3	2.3	1	0.8	4		
Other	18	13.5	15	11.3	33		
Bath at least twice in a day							
Agree	39	29.3	8	6.0	47	6.103	0.047**
Disagree	19	14.3	5	3.8	24		
Not sure	39	29.3	23	17.3	62		
There are complications associated with poor menstrual management?							
Yes	57	42.9	20	15.0	77	0.110	0.946
No	40	30.1	16	12.0	56		
Use materials <6 hours during menstruation							
Agree	29	21.8	1	0.8	30	33.520	0.000**
Disagree	30	22.6	2	1.5	32		
Not sure	38	28.6	33	24.8	71		
Parents employment status							
Employed	54	40.6	19	14.3	73	0.400	0.819
Not employed	31	23.3	11	8.3	42		
Self-employed	12	9.0	6	4.5	18		

**=Statistically significant variable at 0.05

Types of Menstrual Practices

From table 3, the results revealed that the use of old rags ($X^2=15.331$, P-value=0.000); soil ($X^2=7.296$, P-value=0.026) tampons ($X^2=5.825$, P-value=0.054) and feathers ($X^2=8.317$, P-value=0.016) during menstruation were significantly associated with menstrual hygiene management among the adolescents. While sanitary pads ($X^2=4.743$, P-value=0.093), toilet papers ($X^2=4.703$, P-value=0.093) and dry leaves ($X^2=1.756$, P-value=0.416) did not influence safe menstrual hygiene management.

Table 3: Types of menstrual practices that influence menstrual hygiene management

Variable	Menstrual hygiene management				Total	X ²	P-value
	Unsafe		Safe				
	Frequency (N=133)	Percent (%)	Frequency (N=133)	Percent (%)			
The following are materials to be used during menstruation:							
Sanitary pads							
Agree	44	16.5	10	7.5	54	4.743	0.093
Disagree	14	10.5	4	3.0	18		
Not sure	39	29.3	22	16.5	61		
Old rags							
Agree	82	61.7	19	14.3	101	15.331	0.000**
Disagree	7	5.3	4	3.0	11		
Not sure	8	6.0	13	9.8	21		
Soil							
Agree	22	16.5	3	2.3	25	7.296	0.026**
Disagree	39	29.3	11	8.3	50		
Not sure	36	27.1	22	16.5	58		
Toilet papers							
Agree	22	16.5	3	2.3	25	4.703	0.095
Disagree	45	33.8	17	12.8	62		
Not sure	30	22.6	16	12.0	46		
Tampons							
Agree	41	30.8	8	6.0	49	5.825	0.054**
Disagree	52	39.1	24	18.0	76		
Not sure	4	3.0	4	3.0	8		
Dry leaves							
Agree	16	12.0	3	2.3	19	1.756	0.416
Disagree	15	11.3	6	4.5	21		
Not sure	66	49.6	28	21.1	94		
Feathers							
Agree	10	7.5	0	0.0	10	8.317	0.016**
Disagree	21	15.8	5	3.8	26		
Not sure	66	49.6	31	23.3	97		

**=*Statistically significant p < 0.05*

4.2.4 Cultural factors

From table 4 below, analysis was carried out to establish the association between menstrual hygiene management and cultural factors. Ethnic group had a significant association with menstrual hygiene management ($X^2=8.474$, P-value=0.037). Cultural beliefs attached to menstruation were associated with menstrual hygiene management ($X^2=3.820$, P-value=0.051). The analysis also revealed that there was no any significant association between menstrual hygiene management and religion ($X^2=3.141$ and P-value of 0.370), types of cultural beliefs ($X^2=3.260$ and P-value of 0.196) as well as perceptions towards cultural beliefs ($X^2=0.979$) with a P-Value of (0.613).

Table 4: Cultural factors influencing menstrual hygiene management

Variable	Menstrual hygiene management				Total	X ²	P-value
	Unsafe		Safe				
	Frequency (N=133)	Percent (%)	Frequency (N=133)	Percent (%)			
Religion							
Catholics	23	17.3	6	4.5	29	3.141	0.370
Protestants	59	44.4	20	15.0	79		
Muslims	8	6.0	4	3.0	12		
Born again	7	5.3	6	4.5	13		
Ethnic group of respondents							
Matheniko	20	15.0	2	1.5	22	8.474	0.037**
Tepeth	60	45.1	22	16.5	82		
Pei	12	9.0	6	4.5	18		
Bokora	5	3.8	6	4.5	11		
Cultural beliefs attached to menstruation							
Yes	64	48.1	17	12.8	81	3.820	0.051**
No	33	24.8	19	14.3	52		
What are the cultural beliefs? (N=83)							
Blessings	5	6.0	0	0.0	5	3.260	0.196
Abomination	40	48.2	10	12.0	50		
Curse	20	24.1	8	9.6	28		
Perception towards the cultural beliefs							
I belief in them	44	33.1	11	8.3	55	0.979	0.613
I don't belief in them	12	9.0	3	2.3	15		
Not sure	8	6.0	4	3.0	12		

**=Statistically significant variable at 0.05

Multivariate Analysis

All variable significant at the bivariate analysis level and those with p-values close to 0.15 were taken to the regression model to determine the strength of association. From table 5 below age and going to school influenced menstrual hygiene management. Respondents of 13-16 years were 0.3 times less likely to practice safe menstrual hygiene management than those of 17-20 years with a P-value of 0.004; similarly, respondents who were going to school were 5.9 times more likely to practice safe menstrual hygiene management than non school going with a P-value of 0.000. Respondents enrolled in a secondary school were 12.8 times more likely to practice safe menstrual hygiene management compared to those that had never been to school with P-value of 0.038. The participants who agreed that it is good to bath twice in a day during menstruation were 2.9 times more likely to have safe menstrual hygiene management as compared to those who were not sure P-value 0.024. Those who agreed that it is not good to use material for more than 6 hours during menstruation were 13.0 times more likely to practice safe menstrual hygiene management more than those who were not sure (P-value of 0.001). Adolescent girls who agreed to use old rags were 0.4 times less likely to practice safe menstrual hygiene management as compared to adolescents that mentioned other materials (P-value=0.012). Respondents who believed that there are cultural beliefs attached to menstruation were 0.5 times less likely to practice safe menstrual hygiene management (P-value of 0.051).

Table 5: Multivariate analysis of the menstrual hygiene management

Variable	OR at 95% CI	P-value
Age (years)		
17-20	1	0.004**
13-16	0.3 [0.1-0.7]	
School going		
No	1	0.000**
Yes	5.9 [2.6-13.6]	
Level of education		
None	1	0.656 0.650 0.038**
Tertiary	0.6 [0.1-5.9]	
Primary	1.7 [0.2-17.6]	
Secondary	12.8 [1.1-142.6]	
Bath at least twice a day during menstruation		
Not sure	1	0.024** 0.695
Agree	2.9[1.1-7.2]	
Disagree	1.3[0.4-4.5]	
Use materials <6 hours during menstruation		
Not sure	1	0.001** 0.599
Agree	13.0[2.9-58.7]	
Disagree	0.5[0.0-6.0]	
Old rags		
Not sure	1	0.012** 0.175
Agree	0.4[0.1-1.5]	
Disagree	2.8[0.6-12.9]	
Soil		
Not sure	1	0.302 0.076
Agree	0.5[0.1-1.9]	
Disagree	2.2[0.9-5.1]	
Tampons		
Not sure	1	0.302 0.160
Agree	2.2[0.5-9.4]	
Disagree	0.4[0.2-1.0]	
Ethnic group of respondents		
Bokora	1	0.579 0.072 0.265
Matheniko	0.7[0.2-2.2]	
Tepeth	0.2[0.0-1.2]	
Pei	2.4[0.5-11.2]	
Cultural beliefs attached to menstruation		
No	1	0.051**
Yes	0.5[0.2-1.0]	

1: Is the reference group. Significant at p-value < 0.05 (95%CI)

DISCUSSION

Proportion of Karamojong adolescent girls practicing safe menstrual hygiene management

The proportion of adolescent girls practicing safe menstrual hygiene management in Rupa Sub-County Moroto district was 27.07%. This indicates that vast majority of participants practice unsafe menstrual hygiene management, this finding is in line with a study carried out by Nagar *et al.*, (2011) in Iran and Afghanistan which showed that 51% of adolescent girls do not take bath for eight days after the onset of their period while 84% of girls never wash their materials and genital areas. However, inconsistent to our findings, is a study in South India showing a higher proportion (68.9%) of young females having safe practices during menstruation, this included using disposable pads, proper disposal of used materials and bathing at least more than twice per day during menstruation (Omidvar, 2010). The low proportion of adolescent girls practicing safe menstrual hygiene management in Rupa Sub-County can be attributed to poverty, cultural beliefs and lack of adequate information about menstruation management in Karamoja region.

Characteristics of respondents influencing menstrual hygiene management of among adolescent girls of Rupa Sub-County

Age of the respondent and attending school significantly influenced menstrual hygiene management in Rupa Sub-County Moroto district; girls of 13-16 years were 0.3 times (OR 0.3, CI=0.1-0.7, P-value=0.004) less likely to practice safe menstrual hygiene management as compared to those of 17-20 years. This finding is consistent with other studies done in Pakistan and India. In Pakistan girls of 18-22 years were found to practice good hygiene during menstruation, such as use of sanitary pads, change of menstrual materials frequently and adequate washing of the genital area (Tazeen, 2009) while in India, older girls changed materials at night, used old cloth, sanitized materials by boiling and drying them before re-use, the practice of reuse of soiled napkins was commonly found among younger girls and attributed to lack of knowledge about healthy practices Nair *et al.*, (2007). Going to school was significantly associated with menstrual hygiene management, adolescent girls who school going were 5.9 times (OR 5.9, CI=2.6-13.6, P-value=0.000) more likely to practice safe menstrual hygiene management than those who do not go to school. This finding is consistent with a cross-sectional study carried out in Nigeria among 122 girls which aimed at assessing knowledge and practices related to menstruation. The study revealed that girls who are going to school applied better hygienic practices than those girls who were not, the reason being that knowledge-wise the school going girls were better off than those who were not attending school Oche *et al.*, (2012). This finding indicates that the school going girls get the opportunity to interact with their teachers and fellow colleagues and at least get some knowledge on how to practice safe menstrual management contrary to their counter parts who do not go to school and therefore lack such advise.

Socio-economic factors influencing menstrual hygiene management among adolescent girls of Rupa Sub-County

The level of education was found to influence menstrual hygiene management of adolescent girls of Rupa Sub-County; where girls who had high level of education were 12.8 times (OR 12.8, CI=0.4-4.5, P-value=0.038) more likely to practice safe menstrual hygiene management as compared to those girls of low education level or no education at all. This finding is consistent with a study carried out by Bourne *et al.*, (2009) where their observations revealed that, use of unsanitary and sub-standard menstrual absorbents was common among girls from low socio economic status. Therefore undoubtedly poverty and low social class play a major role on the choices of absorbents leading to the use of unsanitary materials.

In a similar study by Gilany *et al.*, (2005) in Egypt, girls also had a similar opinion. A significant association existed between level of education and kind of pads used, storage place and wearing stained dress. This implies that, a lower socio-economic status, lack of access to information about menstruation and money to buy sanitary products for menstrual hygiene affect menstrual practices. It is likely that low level of education coupled with poverty contributes to unhygienic menstrual practices.

The girls who agreed that it's good to bath at least twice a day were 2.9 times (OR 2.9 CI=1.1-7.2 P-value=0.024) more likely to practice safe menstrual hygiene management compared to those girls were not sure. This is in agreement with the reports from Indonesia and India; where a study to understand practices, determinants and impacts among adolescent schoolgirls in Indonesia indicated that most respondents washed the external genitals at least once per day (98.3% and 95.1% of urban and rural respondents respectively). Approximately half of all respondents washed their genitals twice a day and some indicated washing much more frequently (between five and ten times per day). More than 90% of girls washed their hands with soap after changing absorbent materials, although only 59% of urban girls and 48% of rural girls washed their hands before and after (Aliansi *et al.*, 2015). In India the highest percentage of girls were aware of washing genital tracts and perineum at least more than ones in a day, which is essential for health. However the smallest percentage of participants had attitudes of abstaining from bathing and poor perineum care (Moawed, 2001).

Adolescents girls of Rupa Sub-County who agreed that its hygienic to use material for not more than 6 hours during menstruation were 13.0 times (OR 13.0 CI=2.9-58.7, P-value=0.001) more likely to practice safe menstrual hygiene management as compared to their counter parts (table 10). These results concur with the study done in Indonesia where it indicated that only two-thirds of urban girls and less than half (41%) of rural girls changed absorbent materials at least every 4-8 hours or whenever the material was soiled. However, the remaining 46% of girls changed materials less than twice per day. Adequate changing of materials was lowest among girls from rural area; only 31% changed pads every 4-8 hours or when soiled. Girls interviewed during IDI and FGDs reported that girls never or rarely changed materials at school. Of those girls who reported using a reusable cloth during their last menstruation, the majority had washed the material with soap and water and dried in sunlight Aliansi *et al.*, (2015). This practice might be attributed to lack of enough materials and inadequate facilities that can enable girls to change menstrual materials more frequency and also have privacy when changing them.

Types of menstrual practices influencing menstrual hygiene management among adolescent girls of Rupa Sub-County

The use of old rags was significantly associated with unsafe menstrual hygiene management where girls who

used old rags were 0.4 times less likely to practice safe menstrual hygiene management (OR 0.4, CI=0.1-1.5, P-value of 0.012). In the qualitative data analysis most girls acknowledged using old rags because of the limited availability of sanitary towels and the high prices attached to it. This finding is in line with a report that was compiled in a Malawian study, where most respondents state that their feminine hygiene protection is inadequate, 95% of the schoolgirls indicated that they use reusable menstrual cloths. The girls cannot afford to buy disposable pads habitually, or they are unable to find them in local shops. Most girls keep their reusable cloths in place with underwear, but several girls from the rural schools affirm that they do not have money to buy underwear. The girls reported several problems with menstrual cloths smelling bad or falling out at school. Furthermore, the menstrual cloths are large, quickly become saturated, trigger rashes, and can be seen through uniforms (Pillitteri, 2011).

Correspondingly, Khanna *et al.*, (2005) in their study shows that majority of the girls preferred cloth pieces rather than sanitary pads as menstrual absorbent. Only 11.25% girls used sanitary pads during menstruation. However, contrary to our findings, one study in South India reported higher proportion (68.9%) of young females using disposable pads when menstruating (Omidvar *et al.*, (2010). The use of cloth pieces, old rags, soil, dry leaves and toilet papers can be attributed to poverty, high cost of disposable sanitary pads and to a large extent ignorance of the respondents that deter them from using the safe menstrual absorbents available in the market.

Cultural factors influencing menstrual hygiene management among adolescent girls of Rupa Sub-County

The study found that cultural beliefs attached to menstruation significantly influenced menstrual practices. Adolescent girls of Rupa Sub-County who agreed that there are cultural beliefs attached to menstrual hygiene management were 0.5 times (OR 0.5, CI=0.2-1.0, P-value=0.051) less likely to practice safe menstrual hygiene management. This study agrees with different studies done in different African countries; In Ghana menstrual cloths are supposed to be kept in a secret place so that no one sees them, this is because they believe that the cloths are used for witchcraft and can lead to nonstop of menstruation for up to a year, sterility, or even death Scottet *et al.*, (2013). In Malawi some ethnic groups in particular areas pay a man called a *fisi* (traditional doctor) to have sexual intercourse with a girl who has begun menstruating as a sexual initiation rite (Kamlongera, 2012).

Many women in Nigeria also reported that they were not allowed to pray during menstruation, which is perceived as an unclean time. In another study by Adhikari *et al.*, (2007) more than half of the respondents (55.7%, 34), reported that girls are not allowed to do household tasks, 41% (25) said that menstruating girls are not allowed to attend religious functions and go to temples. Almost one in every five respondents (16.4%) reported that still there is practice of keeping menstruating ladies away from home or in corner of room.

This finding affirms that knowledge of adolescent girls on issues of menstruation is influenced by cultural beliefs and practices. Taboos attached to menstruation results in silence and causes limited or lack of adequate knowledge of the practice. When the girls are faced with various myths and traditions which are provided by their culture, some of them conflicting with what they learnt at school, they tend to be confused and fail to know which one to follow.

Conclusion

Unsafe menstrual hygiene practices influenced by age, low socio-economic status and cultural beliefs still exist among adolescent girls in Rupa sub-county in Uganda. Support for adolescent girls to live healthy, safe, unmolested and dignified lives is paramount.

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References

- ADHIKARI P, KADEL B, DHUNGEL S, MANDAL A., 2007. Knowledge and practice Regarding Menstrual Hygiene in Rural Adolescent Girls in Nepal. Kathmandu Univ Med J; 5(3):382-6.
- ALIANSI REM AJA *et al.*, 2015. Understanding practices, determinants and impacts among adolescent school girls in Indonesia. Jl. East Tebet Raya 15, Tebet, South Jakarta.
- ALI, T.S. AND RIZVI, S.N., 2010. Menstrual knowledge and practices of female adolescents in urban Karachi, Pakistan. *Journal of adolescence*, 33(4), pp.531-541.
- EL GILANY A, BADWI K, EL FEDAWY S., 2006. Menstrual hygiene among adolescent schoolgirls in Mansoura, Egypt. *Reprod Health Matters*. 2005 Nov;13(26):147-52.
- KAMLONGERA A., 2012. What becomes of 'her'? A look at the Malawian Fisi culture and its effects on young girls. *Agenda* 2007 01/01.
- KHANNA A, GOYAL RS, BHAWSAR R., 2005. Menstrual practices and reproductive problems: a study of adolescent girls in Rajasthan. *J Health Manag*.7:91-107.

- MOAWED, S., 2001. Indigenous practices of Saudi girls in Riyadh during their menstrual
- NAGAR S, AIMOL KR., 2010. Knowledge of Adolescent Girls Regarding Menstruation in Tribal Areas of Meghalaya; 8(1):27–30.
- NAGAR, S. & AIMOL, R.K. 2011. Knowledge of Adolescents Girls Regarding Menstruation in Tribal Areas of Meghalaya. *Stud Tribes Tribals*, 8 (1): 27-30.
- NAIR, P., V. GROVER, and A. KANNAN., 2007. Awareness and practices of menstruation and pubertal changes amongst unmarried female adolescents in a rural area of East Delhi. *Indian Journal of Community Medicine*, 32(2): p. 156.
- OCHE M. O., UMAR A. S. GANA G. J. & ANGO J. T. 2012. Menstrual Health: The Unmet Needs of Adolescent Girls' in Sokoto, Nigeria. *Scientific Research and Essays*. 7 (3): 410-418.
- OMIDVAR S, BEGUM K.,2010. Factors influencing hygienic practices during menses among girls from south India- A cross sectional study Factors influencing hygienic practices during menses among girls from south India- A cross sectional study. *Int J Collaborative Res Intern Med Pub Health*;2(12):411–23.
- PILLITTERI, P. S. 2011. School Menstrual Hygiene Management in Malawi: More than Toilets. *Sanitation and Hygiene Applied Research for Equity*. http://www.wateraid.org/uk/what_we_do/how_we_work/equity_and_inclusion/10745.asp *Reproductive Ages*. International Journal of Collaborative Research on Internal.
- SCOTT LM, RYUS CR, DOLAN C, DOPSON S, MONTGOMERY P., 2013. The power of ordinary objects: investigating menstrual care in Ghana. Working paper. Oxford University.