

# KNOWLEDGE, BELIEF AND PRACTICE OF MENSTRUAL HYGIENE MANAGEMENT AMONG IN-SCHOOL ADOLESCENTS IN KATSINA STATE, NIGERIA

Ifeoma Stella Okafor-Terver, Montakarn Chuemchit\*

College of Public Health Sciences, Chulalongkorn University, Bangkok, 10330, Thailand

## ABSTRACT:

**Background:** In Nigeria menstruation tends to be an unmentionable topic of discussion, bounded by silence in the name of culture and blanketed in myths and misconceptions; yet, menstruation and menstrual hygiene are emerging as critical issues for gender equality and inclusion, human rights and development. In Nigeria, few studies on MHM had existed, and it is still inadequate thus this research to assess the knowledge, beliefs and practice of MHM among in-school adolescents in Katsina state, Nigeria.

**Methods:** A cross-sectional study was conducted among in-school adolescents menstruating girls between the ages of 10-19 years. Analysis of the variables was done using univariate and bivariate analysis at 95% confidence level. Self-administered questionnaire on menstruation and menstrual hygiene practice was used to elicit responses from volunteered.

**Results:** Among the 395 respondents, 50.4% of the menstruating girls were at the modal age of 12-15. More than 59.7% do not know: the cause of menses, channel through which menses flows, intervals between menses while 157 (39.7%) of the respondents have basic knowledge on menses thus the association of knowledge and practice was found at  $P=0.026$ . Consequently 68.6% agree that there exist some cultural/religious beliefs and myths regarding menses in their various localities and as much as 77.4% agree that there are restrictions and this calls for concern.

**Conclusion:** This study has been able to establish that there is a relationship or association between respondents' level of knowledge, belief, and enabling factors with the level of menstrual hygiene practice. It also well identified those enabling factors which when adequately provided will reduce the difficulties adolescent girls face while managing their monthly period. It has also brought out the urgent need for intensified sensitization of traditional/religious leaders and advocacy to government for inclusion of issues around menstruation management in media programs and addressing the various societal myths, misconceptions and false beliefs which negatively affects menstrual hygiene management.

**Keywords:** In-school adolescents; Menstrual hygiene management (MHM); Water sanitation and hygiene facilities (WASH); Nigeria

DOI: 10.14456/jhr.2017.82

Received: June 2017; Accepted: July 2017

## INTRODUCTION

Globally, many women and girls face challenges when managing their menstruation as a result of many compounding factors, and failure to

address the menstrual hygiene needs of women and girls can have grave consequences including affecting progress towards achieving the sustainable development goals (SDG) of gender equality [1].

In many parts of the world especially in developing countries like Africa and Asia, menstruation tends to be an unmentionable topic,

\* Correspondence to: Montakarn Chuemchit  
E-mail: montakarn.ch@chula.ac.th

## Cite this article as:

Okafor-Terver IS, Chuemchit M. Knowledge, belief and practice of menstrual hygiene management among in-school adolescents in Katsina state, Nigeria. *J Health Res.* 2017; 31(Suppl.2): S179-87. DOI: 10.14456/jhr.2017.82

bounded by silence and blanketed in myths; yet, menstruation and menstrual hygiene management (MHM) are emerging as critical issues for gender equality, human rights and development including reproductive and adolescent health [2].

The commencement of menstruation is one of the most significant changes occurring in girls during adolescent or puberty stage [3]. Equipping the girl child with the necessary knowledge and skills needed to safely, confidently and effectively manage their menstrual hygiene in school is paramount. In a study on MHM in Nigeria, shows that parents and teachers are poorly equipped to improve girl child's knowledge on menstrual hygiene management especially schools with gender mainstream [4-6]. Equally harmful are the long-term consequences of not preparing young people adequately, by not giving them the knowledge and skills to understand the changes they will experience or teaching them to manage basic bodily functions with comfort, confidence and awareness. Without sound information, delivered in an accessible manner at the appropriate age, the onset of puberty can be frightening and upsetting. Especially for girls: The high levels of stigma and disgust associated with menstruation signal to girls that this is a shameful and taboo topic. The negative message can seriously undermine girls' confidence and self-esteem, particularly when they become the target of teasing [7].

Beliefs, misconception and myths about menstruation are propagated by society and often describe women and girls as inferior to men and boys. This reinforces gender inequalities, often constitutes discrimination and has a negative impact on the fulfilment of the universal human rights to dignity, health and education of women and girls [8]. In recent study carried by water aid Nigeria on menstrual hygiene management (MHM) in Benue, Bauchi, and Plateau States in Nigeria to explore and understand existing MHM practices and the context that might impact positively or negatively on the implementation of a MHM program in Nigeria, the study revealed deeply rooted attitudes and myths surrounding menstruation including the belief that a menstruating woman or girl is cursed and possessed by evil spirits and brings bad luck.

A documented data in United Nations Children's Fund (UNICEF) reveal that about one in ten school-age African girl didn't attend school during menstruation or dropped out at puberty due to lack of cleanliness and separate toilet facilities for

female students at schools. Some school of thought were of the opinion that lack of hygienic disposal, hand washing and bathing facilities, menstrual hygiene absorbent materials and spaces or rooms that can help women and girls manage the menstrual discharge with dignity and safety is affecting the level of menstrual hygiene practice [9]. Consequently, water, sanitation and hygiene (WASH) facilities design in almost all the schools visited; completely ignore this very real need of women and girls to manage menstrual discharge. Beautifully designed hygiene programmes targeted at teaching girls and women how to be hygienic without clearly providing absorbent feminine materials, sanitary toilet, spaces for changing, water and washing agents that cater to menstruation is like a vehicle without a driver. Education authorities by ignoring provision of WASH facilities including disposal facilities and mechanisms for soiled materials are supporting the stigma and shame surrounding menstruation.

Some studies conducted in Nigeria on MHM show that negative societal beliefs, attitudes and practices still exist on MHM in schools and communities [10]. However, few studies on MHM in Nigeria had existed, it is still inadequate. Currently, there is no study published on the knowledge, belief and practice, it is on this backdrop that the researcher wish to assess the Knowledge, beliefs and practice of MHM among in-school adolescents in Katsina state.

## METHODOLOGY

The study was cross sectional survey which was carried in four girls junior secondary schools. Taro Yamane formula was used to get 395 adolescents and mixed method was used as follows; homogeneous purposive Sampling method was used at LGA level to get the targeted menstruating in-school adolescent girls while convenience sampling techniques was used at school level to get the proportion of population that was willing to participate in the study and this was determined by multiplying the school population by the sample size and divided it by the study population thus 166:19, 555:63, 1587:180 and 1168:133.

Questionnaire was adapted based on previous published studies [2, 4]. Socio-demography section have 14 items and simple percentage and frequencies were used to analyze the data while knowledge section have 9 items & 1 mark was assigned to each correct response thus Bloom's cut off point was used, Table 1.

**Table 1** Categorization of knowledge level

Level of knowledge	Cut-off point	Scores
Low	<60%	0-3
Moderate	60% - 79%	4-6
High	≥80%	7-9

**Table 2** Categorization of practice

Practice Level	Cut-off point	Scores
Low	<-1SD	0-6
Moderate	-1SD≤x<1SD	7-9
High	1SD≤	10-15

Belief-myths: Have 14 items (7 each), 1 mark was given to each “agree” item while disagree has zero. Enabling factors: have 9 items and each correct response is given 1 otherwise zero.

Practice of MHM: have 15 items, each correct response was assigned 1 otherwise zero. Total practice scores were categorized into three levels using mean cut off point, Table 2.

#### Data collection

Collection of data was done by proxy (research team). Eight data collectors were engaged and 2 team lead making the team members to be 10 (ten) ensured that questionnaires were filled correctly and collected in seal envelope. There was a day orientation and training of the 8 field data collectors who are all females as the topic of discuss is sensitive especially in high Moslem religious state like Katsina, the features of the orientation were basically on the objectives of the study, content clarity and research ethics.

#### Data analysis

Collected data were cleaned, coded and ran using SPSS. The statistical analysis was done as follows: univariate analysis is used to describe the distribution of one variables. Descriptive statistics of frequencies and percentages were used on continuous variables such as socio-demographic variables. Bivariate analysis using cross tabulation test was done to establish the significance between all the variables while chi-square was used to find out whether there is a relationship between categorical (nominal or ordinal) variables and level of MHM practice.

#### Quality control

The questionnaires used were validated, pre-tested and translated to the local Hausa language by a media PRO, this was later translated back to English to ensure content consistency.

#### Ethical consideration

Approval from the Katsina State Health Research Ethics Committee (HREC) of the Ministry of Health was obtained with the ethics assigned approval number MOH/ADM/SUB/1152/1/143.

#### RESULTS

##### Socio-demographic characteristics

Table 3, among the participants, girls within the modal age of 14-15 and 12-13 were of the highest number; 199 (50.4%) and 108 (27.3%) respectively. Consequently, as much as 383 (97%) and 882 (96%) were of Moslem religion and of Hausa ethnic group in Nigeria. The data in the graph and table show the level of education of the fathers of the respondents were majorly of literacy level of reading and writing in any language as little population of 28.9% have high school diploma. However, the mothers tend to be more in level of their education as 33.9% of them have diploma from high school. The fathers 240(60.8%) of the respondents are mainly of government employment while majority of the mothers 148 (37.5%) have their occupation as house wife. Furthermore, 42.6 percent followed by 23.6% of the respondents indicated they had their menarche between 14-16 and 11-13 years respectively while 16.5% could not recall their age at menarche. The astonishing data here is that 150 (38%) of the respondents says their length of menses is above 7 days, 133(33.7%), 133 (33.7%) 3-4 days' duration and 101(25.6%) 5-7 days.

##### Knowledge on MHM

Table 4 shows the response items by respondents concerning their knowledge on menstruation. Among the respondents, 158(40%) knew that menses is physiological, others believe it is cause by god and some said is pathological, however, as much as 60% of the respondent did not have the basic knowledge

**Table 3** Socio-demographic characteristics

		Number	%
<b>Age (years)</b>	10 – 13	125	31.6
	14- 15	199	50.4
	16 - 19	71	18
<b>Ethnicity</b>	Hausa	383	97
	Fulani	8	2
	Igbo	1	0.3
	Yoruba	3	0.8
<b>Religion</b>	Moslem	382	96.7
	Christian	8	2
	Traditionalist	4	1
	Orthodox	1	0.3
<b>Father education</b>	Illiterate (cannot read & write)	19	4.8
	Literate (able to read & write)	161	40.8
	Pry school 1 - 3 grade	18	4.6
	Pry school 4 - 6 grade	7	1.8
	Junior sec school 1 – 3	57	14.4
	Senior sec school 1 – 3	19	4.8
	College diploma and above	114	28.9
<b>Mother educational</b>	Illiterate (cannot read & write)	29	7.3
	Literate (able to read & write)	114	28.9
	Pry school 1 - 3 grade	18	4.6
	Pry school 4 - 6 grade	11	2.8
	Junior sec school 1 – 3	24	6.1
	Senior sec school 1 – 3	65	16.5
	College diploma and above	134	33.9
<b>Occupation of father</b>	Farmer	64	16.2
	Government employee	240	60.8
	Merchant/Trade	52	13.2
	Private organization employee	13	3.3
	Daily laborer	26	6.6
<b>Occupation of mother</b>	Farmer	31	7.8
	Government employee	89	22.5
	Merchant/Trade	100	25.3
	Private organization employee	14	3.5
	Daily laborer	13	3.3
	House wife only	148	37.5
<b>Age at first menses/period (years)</b>	10 – 13	153	38.7
	14 – 15	169	42.8
	16 - 19	8	2
	Do not know	65	16.5
<b>length of your menses/ period (days)</b>	1 - 2	11	2.8
	3 - 4	133	33.7
	5 - 7	101	25.6
	Above 7	150	38

**Table 4** Parameters for knowledge

	Answered Correctly	
	No	%
Menstruation is physiological	158	40
Menstrual blood is releases from the uterus	38	9.6
The age most girls usually experience first menses is between 10 -15.	290	73.4
The duration of normal menstruation, in normal person is 2 – 7 days.	281	71.1
The interval between two menstrual cycles is between 24 to 28 days.	126	31.9
Menstrual blood has foul odour during menstruation, No	282	71.4
Menstrual blood is unhygienic, No	214	54.2

**Table 5** Parameter used for assessing menstrual hygiene practice

	Yes	
	Number	%
Using absorbent material during menstrual period	361	91.4
Commercially made sanitary pads are used during menses	225	62.3
Toilet roll / Tissue paper are being used during menstruation	39	10.8.
Cloths or rags are used during menstruation	97	26.9
If cloth is used as pad, the cleaning is by washing with water and soap	66	68
Washed cloths are dried under the sunlight	34	35
Sanitary towels should be changed twice or more daily change the cloth/pad in a day?	64	16.2
Disposal of used pad should be in dustbin	35	8.9
Used pads should be wrapped with plastic bag before disposal	237	60
Panty should be changed twice or more per day	189	47.8
Bath during Menses should be twice or more daily	31	7.8
Cleaning of genitalia during menstruation is important	349	88.4
Genitalia should be cleaned with water and soap	213	61
Washing of hands after changing the pad is important	364	92.2
Hands should be washed with soap and water after changing of pads	310	85.2

**Table 6** Relationship between knowledge and practice level

	Total (n)	Practice level						p-value <sup>1</sup>
		Low		Medium		High		
		Number	%	Number	%	Number	%	
<b>Knowledge level</b>	<b>395</b>							0.026
Low	225	49	21.8	145	64.4	31	13.8	
Moderate/High	170	34	20.0	126	74.1	10	5.9	

<sup>1</sup>p-value by x2

on the what menstruation is. Concerning, the channel through which menses flows, 90.4% did not know as well as 61% did not know the cause of menses. 31.9% knew the intervals between one menses and the next whereas 58.1% did not know. In regards to duration, age at menarche, colour, smell and unhygienic nature of menses, majority show they know about them as none of these mentioned items have less than 50%.

#### Practice on MHM

Table 5 below shows the result regarding number and percentage of respondents concerning menstrual hygiene management and practice by each item in the questionnaire as follows: 91.4% prefers use of sanitary pad than other materials which could be used in managing menses. Consequently, 62.3% are using commercially made sanitary pad, 10.8% and 26.9% respectively are using tissues and cloths respectively. Out of those using cloths as pad, 86% do wash their rags with water and soap, of which 35% dries under the sun while a huge other do dry them under the bed or inside the room. As few as (64)16.2% are changing their sanitary towels twice or more, the rest do change once a day, 8.9% disposes used pad in

dustbin while others dispose in open filed or latrines, however, as much as 60% wraps their used pads before disposing. Among the respondents, 47.8% changes pant more than once, while as few as 7.8% bath more than once. The amazing thing here is that they are so conscious of their genitalia hence, 88.4% and 61% washes their genitalia and with water and soap. Handwashing seem to be the most practiced among the respondents thus 92.2% washes their hand after handling pads and 85.2% uses water and soap for hand washing.

#### Association between knowledge and practice of MHM by the respondents.

From the Table 6, it is being established by the p-values or level of significance that there is association that exist between knowledge and practice of menstrual hygiene management by 0.026.

#### Association between beliefs and practice

Table 7 shows that there is a relationship or an association between the belief on restrictions placed on menstruating women with the level of hygiene practice they exhibit during menstruation by <0.000.

**Table 7** Association between beliefs and level of practice

	Practice level							p-value <sup>1</sup>
	Total (n) 395	Low		Medium		High		
		No.	%	No.	%	No.	%	
<b>Menstruation girls are forced to practice restrictions during menses?</b>								<0.01
Disagree	89	22	24.70%	48	53.90%	19	21.30%	
Agree	306	61	19.90%	223	72.90%	22	7.20%	
<b>Menstruation is a sign of impurity of the girl or woman</b>								0.335
Disagree	117	30	25.60%	75	64.10%	12	10.30%	
Agree	278	53	19.10%	196	70.50%	29	10.40%	
<b>Menstruating girl or woman is not allowed to fast</b>								0.093
Disagree	152	37	24.30%	105	69.10%	10	6.60%	
Agree	243	46	18.90%	166	68.30%	31	12.80%	
<b>It is not allowed for menstruating girl or woman to pray</b>								0.815
Disagree	179	39	21.80%	120	67.00%	20	11.20%	
Agree	216	44	20.40%	151	69.90%	21	9.70%	
<b>Menstruating women or girls are restricted from entering Mosque</b>								0.680
Disagree	172	39	22.70%	114	66.30%	19	11.00%	
Agree	223	44	19.70%	157	70.40%	22	9.90%	
<b>It is a forbidden for a menstruating girl or women to touch or hold holy Quran</b>								0.725
Disagree	179	37	20.70%	121	67.60%	21	11.70%	
Agree	216	46	21.30%	150	69.40%	20	9.30%	
<b>Girls or women undergoes purification after menses</b>								0.399
Disagree	46	11	23.90%	28	60.90%	7	15.20%	
Agree	349	72	20.60%	243	69.60%	34	9.70%	

<sup>1</sup>p-value by x2**Table 8** Association between enabling factors and level of practice

	Practice level							p-value <sup>1</sup>
	Total (n) 395	Low		Medium		High		
		No.	%	No.	%	No.	%	
<b>preferred sanitary material</b>								<0.01
Tissue/ Toilet roll	56	20	35.70%	33	58.90%	3	5.40%	
Cloth	59	16	27.10%	33	55.90%	10	16.90%	
Sanitary Towel/Pad	280	47	16.80%	205	73.20%	28	10.00%	
<b>Commercial made pads are available within your school or community</b>								0.713
No	148	31	20.90%	104	70.30%	13	8.80%	
Yes	247	52	21.10%	167	67.60%	28	11.30%	
<b>More than 500 naira is spent on the average in a month on menstrual material</b>								0.033
No	342	65	19.00%	239	69.90%	39	11.10%	
Yes	53	18	34.00%	32	60.40%	3	5.70%	
<b>Provision of menstrual materials</b>								0.028 <sup>a</sup>
Self	350	66	18.90%	247	70.60%	37	10.60%	
School authorities	12	2	16.70%	9	75.00%	1	8.30%	
Father and mother	33	15	45.50%	15	45.50%	3	9.10%	

**Table 8** Association between enabling factors and level of practice (cont.)

	Practice level							<i>p</i> -value <sup>1</sup>
	Total (n) 395	Low		Medium		High		
		No.	%	No.	%	No.	%	
<b>Type of school toilet</b>								<0.001
Water cistern (WC)	61	14	23.00%	37	60.70%	10	16.40%	
Pour flush	58	25	43.10%	29	50.00%	4	6.90%	
Ventilated improved pit latrine (VIP)	77	17	22.10%	56	72.70%	4	5.20%	
Local pit latrine	199	27	13.60%	149	74.90%	23	11.60%	
<b>Type of toilet at home</b>								0.208 <sup>a</sup>
Water cistern (WC)	58	10	17.20%	43	74.10%	5	8.60%	
Pour flush	157	44	28.00%	99	63.10%	14	8.90%	
Ventilated improved pit latrine (VIP)	43	10	23.30%	28	65.10%	5	11.60%	
Local Pit Latrine	135	19	14.10%	99	73.30%	17	12.60%	
None	2	0	0.00%	2	100.00%	0	0.00%	
<b>Access to clean toilet always</b>								<0.01
Yes	367	68	18.50%	264	71.90%	35	9.50%	
No	28	15	53.60%	7	25.00%	6	21.40%	
<b>Type of water facility at school</b>								0.013 <sup>a</sup>
Motorized borehole	57	18	31.60%	35	61.40%	4	7.00%	
Hand pump borehole (HPBH)	291	51	17.50%	208	71.50%	32	11.00%	
Hand dug open well	30	12	40.00%	17	56.70%	1	3.30%	
Improved hand dug well	11	1	9.10%	6	54.50%	4	36.40%	
None	6	1	16.70%	5	83.30%	0	0.00%	
<b>Type of water facility at home</b>								<0.01
Motorized borehole (MBH)	118	15	12.70%	90	76.30%	13	11.00%	
Hand pump borehole (HPBH)	128	33	25.80%	85	66.40%	10	7.80%	
Hand dug open well	79	20	25.30%	45	57.00%	14	17.70%	
Improved hand dug well	30	3	10.00%	27	90.00%	0	0.00%	
None	40	12	30.00%	24	60.00%	4	10.00%	

<sup>1</sup>*p*-value by  $\chi^2$ <sup>a</sup>*p*-value by Fisher Exact Test

### Association between enabling factors and practice of menstrual hygiene management

The result emanated from the analysis in the table below reveals association that exist with various enabling factors (availability, affordability and accessibility of sanitary pad, and availability/accessibility of WASH facilities) at both school and home at  $P=0.03$  and  $<0.01$  respectively and practice of menstrual hygiene management, Table 8.

## DISCUSSION

### Knowledge

The result shows that majority of the respondents generally have low knowledge level of menstruation and its practice. This reflected in the fact that majority did not know the cause of menstruation thus attributed it to cause from the God, few view menses as being flow from the uterus, some could attest to the age of menarche while majority did not know their menstrual cycle. The finding of this study therefore conforms to that

of Busari [11], Prajapati and Patel [12], Thakre et al. [13], Mahon and Fernandes [14], Adhikari et al. [15], Aluko et al. [16], that the knowledge of their respondents regarding menstruation and its management is low, poor, fair, insufficient or inadequate thus need to be addressed. However, in contrast to the findings of this study of Pandit et al. [17] and Lawan et al. [18] noted that there is high knowledge among his respondents as they exhibit correct knowledge regarding menses as against very few that ascribe menses to the curse of the god'.

This study could establish in general term an association between knowledge and level of practice at  $p=0.026$  significance level, it intones that the level of MHM hygiene practiced by respondents is somewhat linked to their level of knowledge. This general finding conforms to findings from other studies; Pandit et al. [17] and Lawan et al. [18] states that knowledge on menstrual hygiene was positively associated with practice on MHM with a significance level of  $p<0.0$  and  $p=0.05$  respectively.

### Cultural-beliefs

This study shows that there exist serious cultural and religious beliefs including the misconception and myths restricting menstruating women from engaging in so many activities including religious activities. However, the religious obligation of the study area may have contributed to the moderate hygiene practice during menses irrespective of the restriction. In this study, there is significant relationship of belief to practice with  $p < 0.01$ . This finding conforms with some findings of other researchers: Abioye-Kuteyi [6], Prajapati and Patel [12], Thakre et al. [13], and Aluko et al. [16], and Pandit et al. [17] which shows that women and girls face many restrictions which affects their menstrual hygiene management.

### Practice of MHM

The study reveals that large proportion of the respondents practice good hygiene at moderate level irrespective their low knowledge. This agrees with the findings from other studies; Abioye-Kuteyi [6], Rajakumari [3], Adinma [19], Juyal [20], Geethu [21], Dasgupta and Sarkar [22] that noted that the practice level on MHM by their respondents were found to be on low, bad, fair or moderate not withstanding their knowledge level. However, some other studies tend to contradict the above findings; Aluko [16], and Yasmin [23] were of good practice.

### Enabling environment

Majority of the respondents prefer use of commercially produced absorbent materials and this shows an association of  $p < 0.01$  to level of hygiene practice which is moderate, consequently majority could not afford it and this is also found to be significant to practice with  $p < 0.01$ . Majority of the respondent indicates that they provide sanitary pads or materials by themselves and it is also reveal to be significant to practice with  $p = 0.028$ . Provision or availability of and accessibility to clean latrine is found to be associated with level of hygiene practice with  $p < 0.01$  respectively. The availability of toilet especially gender friendly types is key to boosting and sustaining good MHM in both schools and communities. Furthermore, type of water facility accessed in school and home goes a very long way in influencing good MHM among menstruating girls as this was found to be significant with  $p = 0.013$  and  $p < 0.01$  respectively.

### Limitations

Limitations to this study include use of local

language which is Hausa in designing questionnaire and willingness of conservative Moslem menstruating girls to participate in the study. This study cannot be generalized in Nigeria and other countries.

### CONCLUSION

This study has been able to establish that there is association between respondents' level of knowledge, belief, and enabling factors with the level of menstrual hygiene practice. It also identified those enabling factors which when adequately provided will reduce the difficulties adolescent girls face while managing their monthly period. It brought out the urgent need for intensified sensitization of traditional and religious leaders for addressing the various societal myths, misconceptions and false beliefs which negatively affects menstrual hygiene management. The school policy makers and curriculum designers are not left out as there is need for inclusion of MHM related topics in major subjects like basic science for primaries and junior secondary school while the policy makers should include in the school design, the MHM girl friendly WASH facilities as this will instill confidence and boost school attendance. It also opens a channel for further studies on this same study using qualitative research methods.

### REFERENCES

1. Accountability 2020: snapshot of indicators. [cited 2017 June]. Available from: <https://pma2020.org/research/country-reports/nigeria>
2. Water Suply and Sanitation Collaborative Council [WSSCC]. Menstrual hygiene management, behaviour and practices in Loung, Senegal. Geneva: WSSCC and UN Women; 2014
3. Rajakumari A. A study on knowledge regarding menstrual hygiene among adolescent school girls. *Global Journal of Current Research*. 2015; 3(4): 111-6.
4. UNICEF. Menstrual hygiene management in Indonesia: understanding practices, determinants and impacts among adolescents school girls. Indonesia: UNICEF; 2015.
5. Onygebu N. Menstrual hygiene among women and young females in rural eastern Nigeria; 2011. [cited 2017 June]. Available from: [https://www.unicef.org/wash/schools/files/Nigeria\\_-\\_Improvement\\_of\\_MHM\\_among\\_Schoolgirls.pdf](https://www.unicef.org/wash/schools/files/Nigeria_-_Improvement_of_MHM_among_Schoolgirls.pdf)
6. Abioye-Kuteyi EA. Menstrual knowledge and practices amongst secondary school girls in Ile Ife, Nigeria. *J R Soc Promot Health*. 2000 Mar; 120(1): 23-6.
7. UNESCO. Good policy and practice in health education booklet 9: puberty education & menstrual hygiene management. UNESCO; 2014.

8. WaterAid. Menstruation matter to everyone everywhere. [cited 2017 June]. Available from: <http://menstrualhygieneday.org/materials/menstruationmatters/>
9. Patkar A. Menstruation and menstrual hygiene management in selected Kawazula-Natal schools. Australai: OXFAM; 2001.
10. UNICEF. Assessment of menstrual hygiene management (MHM) in secondary schools in Katsina, Osun and Anambra states of Nigeria. UNICEF; 2016.
11. Busari AO. Menstrual Knowledge and health care behavior among adolescent girls in rural, Nigeria. *Int J Sci Appl Technol.* 2012; 2(4): 149-54.
12. Prajapati J, Patel R. Menstrual hygiene among adolescent girls: a cross sectional study in urban community of Gandehinagar. *Journal of Medical Research.* 2015; 1(4): 122-5.
13. Thakre SB, Thakre SS, Reddy M, Rathi N, Pathak K, Ughade S. Menstrual Hygiene: Knowledge and Practice among Adolescent School Girls of Saoner, Nagpur District. *J Clin Diagn Res.* 2011; 5(5): 1027-33.
14. Mahon T, Fernandes M. Menstrual hygiene in South Asia: a neglected issue for WASH (water, sanitation and hygiene) programmes. *Gender & Development.* 2010; 18(1): 99-113. doi: 10.1080/13552071003600083
15. Adhikari P, Kadel B, Dhungel S, Mandal A. Knowledge and practice regarding menstrual hygiene in rural adolescent girls of Nepal. *Kathmandu University Medical Journal.* 2007 Jul-Sep; 5(3): 382-6
16. Aluko OO, Oluya OM, Olaleye OA, Olajuyin AA, Olabintan TF, Oloruntoba-Oju OI. Knowledge and menstrual hygiene practices among adolescents in senior secondary schools in Ile Ife, south-western Nigeria. *Journal of Water Sanitation and Hygiene for Development.* 2014; 4(2): 248-56. doi: 10.2166/washdev.2014.084
17. Pandit D, Bhattacharyya PK, Bhattacharya R. Menstrual Hygiene: Knowledge and Practice among Adolescent School Girls In rural areas of West Bengal. *IOSR Journal of Dental and Medical Sciences.* 2014; 13(6): 19-24.
18. Lawan UM, Yusuf NW, Musa AB. Menstruation and menstrual hygiene amongst adolescent school girls in Kano, Northwestern Nigeria. *Afr J Reprod Health.* 2010 Sep; 14(3): 201-7.
19. Adinma ED, Adinma JI. Perceptions and practices on menstruation amongst Nigerian secondary school girls. *Afr J Reprod Health.* 2008 Apr; 12(1): 74-83.
20. Juyal R, Kandpal SD, Semwal J, Negi KS. Practices of menstrual hygiene among adolescent girls in a district of Uttarakhand. *Indian Journal of Community Health.* 2012; 24(2): 124-8.
21. Geethu C, Paul EP, Thomas JE, Pullan CS, Hemalatha S, Sivakumar T. Appraisal of menstrual hygiene management among women in a rural setting: a prospective study. *International Journal of Community Medicine and Public Health.* 2017; 3(8): 2191-6. doi: 10.18203/2394-6040.ijcmph20162569
22. Dasgupta A, Sarkar M. Menstrual hygiene: How hygienic is the adolescent girl? *Indian J Community Med.* 2008 Apr; 33(2): 77-80. doi: 10.4103/0970-0218.40872
23. Yasmin S, Manna N, Mallik S, Ahmed A, Paria B. Menstrual hygiene among adolescent school students: An indepth cross-sectional study in an urban community of WestBengal, India. *IOSR Journal of Dental and Medical Sciences.* 2013; 5(6): 22-6.