

■ Original Research Article

Assessment of Genital Hygiene Among Pregnant Women Attending Antenatal Care Clinics in Selected Health Facilities in Sokoto Metropolis, Sokoto State, Nigeria

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ABSTRACT

Background: Infection in pregnancy is a preventable cause of maternal and neonatal morbidity and mortality. **Objectives:** The study assessed the knowledge and practice of pregnant women on personal and genital hygiene. **Methods:** A semi-structured interviewer-administered questionnaire was used to collect data among 427 pregnant women who were selected using a multistage sampling technique in Sokoto metropolis. Mean and standard deviation were calculated for continuous variables, categorical variables were summarized as frequencies and percentages, and cross-tabulations were done to examine the relationship between categorical variables using Chi-square/Fisher's exact test and logistic regression. The level of statistical significance was set at 5% ($p < 0.05$). **Results:** The mean age of the participants was 28.3 ± 7.1 years; the majority (91.1%) of the participants had good knowledge of personal/genital hygiene, whereas a high proportion (82.9%) of them had appropriate practice of personal/genital hygiene. Participants with formal education had better knowledge of personal/genital hygiene ($\chi^2 = 10.709$, $p = 0.002$), and their marital and educational statuses were found to be the predictors of genital hygiene knowledge (aOR = 4.8, 95%CI = 1.8-13.2) and (aOR = 2.5, 95%CI = 1.1 – 5.7) respectively. Similarly, in addition to participants' marital status, their spouses' occupations were found to be determinants of personal/genital hygiene practices. **Conclusion:** The respondents' marital status, educational level, and occupation of their spouses were found to be the determinants of personal/genital hygiene. Improving women's literacy level and empowering them will improve their knowledge and practice of personal and genital hygiene.

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INTRODUCTION

Hygiene refers to conditions and practices that help to maintain health and prevent the spread of diseases, while personal hygiene is maintaining the body's cleanliness (1). Genital hygiene is a component of personal hygiene

that has a key role in preventing genital infections. Pregnant women are more vulnerable to diseases and infections associated with poor hygiene, so the importance of adequate hygiene practices cannot be overstressed. Infections in pregnancy are a preventable cause of maternal and neonatal morbidity and mortality;

genital infections during pregnancy can be associated with adverse pregnancy outcomes such as stillbirth, preterm birth, low birth weight, and spontaneous abortion. (2) Mother-to-baby transmission of infections can occur in utero (congenital) or during delivery (perinatal), and hematogenous spread as a result of maternal viremia, bacteremia, or parasitemia also occurs. (3) Some of the genital infections that can occur as a result of poor hygiene include Bacterial vaginosis, Syphilis, Gonorrhea, other urinary tract infections, Hepatitis, etc. (3) Abnormal vaginal discharge is one of the commonest presentations of genital infections with pregnancy, poor perineal hygiene, long-term antibiotics use, multiple partners, and frequent sexual intercourse, constituting some of the risk factors. (4) Lack of hand-washing habits, not using proper underwear, and not practicing genital hygiene after using the restroom are described as situations of poor hygiene. (5) Modifying the mother's behavior of personal cleanliness will reduce the likelihood of contracting a communicable disease, and this can prevent maternal primary infection. (3)

Previous studies in Turkey reported that the majority of the participants had received information about genital hygiene from healthcare professionals, and most of those who wished to learn about genital hygiene opined that healthcare professionals were their preferred source of information.(5, 6)

A study in Iran by Amiri and colleagues reported that genital hygienic practices such as infrequent change of underwear and poor genital cleaning pre and post-coitus were associated with urinary tract infection in pregnancy.(7) Another study in Saudi Arabia reported frequent sexual intercourse greater than or equal to three per week and taking baths once or less per week to be associated with urinary tract infection in pregnancy (8). The use of soap to clean the genital area affects the normal flora of the vagina and can create a potential opportunity for harmful microorganisms to cause infections among women; the majority of respondents in a study by Sowole et al. in Ogun state, southwest Nigeria were reported to be using soap and water to clean their genitals(9) In a study of genital behavior and practices in Cameroon, Nkamedjie et al. reported that the majority, 70%, of the participants showed a preference for cotton underwear, and most (36%) used only water to clean their genital area.(10)

There is a need to maintain optimal genital hygiene during pregnancy in order to prevent any deleterious effects on the pregnancy and the unborn child. It is in this regard that this study was carried out with the aim of assessing the knowledge and practice of personal/genital hygiene amongst pregnant women attending antenatal clinics in Sokoto metropolis. It is hoped that findings from this study will assist in developing guidelines and policies on genital hygiene practices amongst our pregnant women if the goals of

SDG3 (ensure healthy lives and promote well-being for all at all ages) are to be achieved.

MATERIALS AND METHODS

Study Design and Setting

This cross-sectional study was carried out in the Sokoto metropolis of Sokoto state. The State is located between longitude 11°30', 13°50' East, and latitude 4° to 6°0' North of the Equator. It is bordered to the North by Niger Republic, Zamfara State to the East, while Kebbi State borders most of the South and Western parts. The 2020 projected population of the state was 5,313,527 based on the 2006 general population census.(11) The Health Facilities in the metropolis are comprised of Primary, Secondary, and Tertiary. The primary consists of Health Posts, Dispensaries, Basic Health Clinics, and Primary Health Care Centers; the Secondary is made up of General as well as Private Hospitals, whereas the tertiary consists of the State Specialist Hospital and the Teaching Hospital.

The study was carried out amongst pregnant women attending Antenatal care in selected health facilities in the metropolis who must have had at least two visits and do not have any serious medical or pregnancy associated illness (exclusion criteria).

Sample Size Determination and Sampling Technique

The sample size estimation was done using the formula (12) $n = Z^2pq/d^2$ where; **n** Sample size to be determined, **Z** = Standard normal deviate at 95% confidence interval = 1.96, **p** = Proportion of factor under study (knowledge of genital hygiene among pregnant women = 50% (0.5) **q** = Complementary probability of $p = 1 - p = 0.5$, **d** = Precision (or margin of error) of 5% = 0.05. Using the above formula, a sample size of 384 was obtained. Allowing a 90% response rate, 427 respondents were recruited into the study.

A multistage sampling technique was used to select the eligible respondents as follows:

- **Stage 1:** Using simple random sampling by balloting, two (2) Local Governments Areas namely Wamakko and Sokoto South LGAs were selected out of the four metropolitan LGAs. The health facilities in each of the selected local governments were listed and categorized into primary, secondary and tertiary.
- **Stage 2:** Using simple random sampling by balloting, one (1) health facility was selected from each category of the above-listed facilities. The days each of the selected facilities conducted antenatal care (ANC) clinic were noted and the average monthly

attendance of ANC by the women was also obtained from the health records unit of the facilities. Thereafter, proportionate allocation (PA) was done to get the number of participants that were enrolled in each of the facilities per LGA as follows:

$$\text{PA (n)} = \frac{\text{Average no. of pregnant women that attend ANC/month in one selected facility}}{\text{Total no. of pregnant women that attend ANC/month in one selected facility}} \times \text{sample size}$$

- **Stage 3:** Systematic sampling technique was used to enroll 1 in 3 participants into the study using simple random sampling by balloting.

Data Collection Tool and Procedure

A pre-tested, semi-structured interviewer-administered questionnaire was used to collect participants' sociodemographic information, knowledge of personal and genital hygiene, and reported practices on personal and genital hygiene. The questionnaire was designed in English, translated into a local language (Hausa), and then translated back to English to ensure consistency. The questionnaire was then built in an Open Data Kit (ODK) XML format and downloaded onto the data collectors' smartphones/tablets. Three nurses and Resident doctors were trained as research assistants to help in the collection of data. Data were collected at the antenatal care (ANC) clinics of the selected facilities as the pregnant women waited to be attended to or were on their way out after receiving care.

Ethical Clearance

The ethical approval for the study was obtained from the Health Research Ethics committee of Usmanu Danfodiyo University Teaching Hospital, Sokoto. Informed consent was obtained from the participants.

Data Analysis

We carried out the data analysis using the Statistical Package for Social Sciences (SPSS) version 25. Frequency runs were done to edit and clean the e-data further. Knowledge and practice variables were scored; one mark was awarded to each correct answer on knowledge and practice, while zero marks were awarded to wrong or negative responses. The scores were converted to percentages and graded. For knowledge, 0 to 49% was considered poor knowledge, and $\geq 50\%$ was considered good knowledge. Similarly, for practice, 0 to 49% was considered inappropriate, whereas $\geq 50\%$ was considered appropriate hygienic practices. Mean and

standard deviation were calculated for continuous variables, categorical variables were summarized as frequencies and percentages, and cross-tabulations were done to examine the relationship between categorical variables using Chi-square/Fisher's exact test and logistic regression. The level of statistical significance was set at 5% ($p < 0.05$).

RESULTS

Sociodemographic Characteristics of Participants

All questionnaires were administered and filled out, giving a response rate of 100%. The ages of the

Table 1: Sociodemographic Characteristics of Respondents

Variable	Frequency	(%)
(n = 427)		
Age (in years)		
<20	58	13.6
21 – 30	243	56.9
31 – 40	102	23.9
41 above	24	5.6
Marital status		
Married	404	94.6
Divorced	18	4.2
Separated	5	1.2
Educational level		
None	117	27.4
Primary	44	10.3
Secondary	111	26.0
Tertiary	155	36.3
Occupation		
Full time house wife	179	41.9
Civil servant	98	23.0
Student	45	10.5
Farmer	12	2.8
Business	87	20.4
Others	6	1.4
Education of husband/partner		
None	74	17.3
Primary	16	3.7
Secondary	101	23.7
Tertiary	236	55.3
Occupation of husbands/partner		
Unemployed	38	8.9
Civil servant	190	44.5
Student	26	6.1
Farmer	46	10.8
Business	121	28.3
Others	6	1.4
Parity		
Primigravida	70	16.4
Multigravida	300	70.3
Grand multi	57	13.3

participants ranged from 17 to 50 years (mean = 28.3 ± 7.1); the majority, 243 (56.9%) of the participants were

between 21 to 30 years of age. Most, 404 (94.6%), were married, 155 (36.3%) had attained tertiary education, and 179 (41.9%) were full-time housewives. More than half, 236 (55.3%) of the participants' spouses had attained the tertiary level of education, whereas 190 (44.5%) of them were civil servants. Most, 300 (70.3%) of the participants were multigravidas. (Table 1)

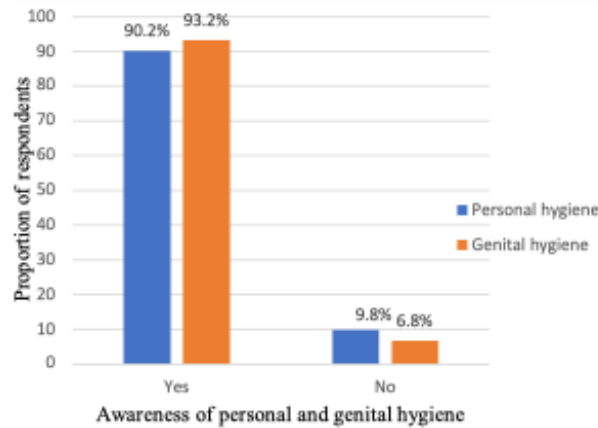


Figure 1: Awareness of Personal and Genital Hygiene

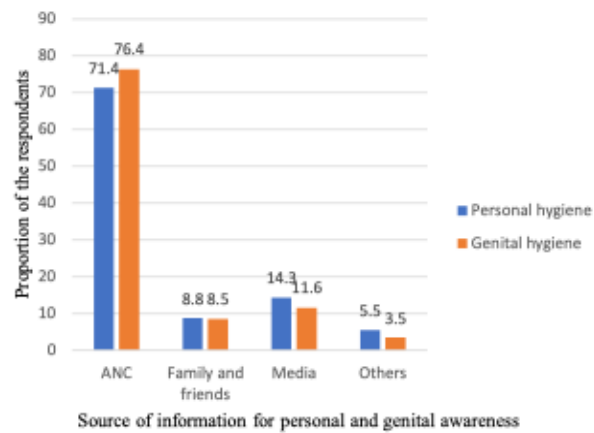


Figure 2: Source of Information for Personal and Genital Hygiene Awareness

Knowledge of Personal and Genital Hygiene

The majority (90.2%) and (93.2%) of the participants were aware of both personal and genital hygiene, respectively. (Figure 1). Most (71.4%) of the participants heard about personal and genital hygiene during their antenatal clinic (ANC) visits. The majority, 388 (91.1%) of the participants had good knowledge of genital and personal hygiene, 395 (92.7%) of the participants knew about the requirement for both personal and genital hygiene. (Table 2).

Table 2: Participants' Knowledge of Personal/Genital Hygiene

Variable	Frequency (n = 427)	Percentage (%)
Do you know the requirement for personal hygiene		
Yes	395	92.7
No	31	7.3
Do you know the requirement for Genital hygiene		
Yes	396	92.7
No	31	7.3
Do you know the difference between personal and genital hygiene		
Yes	387	88.5
No	49	11.5
Do you know the harm from not maintaining personal hygiene		
Yes	377	88.3
No	50	11.7
Do you know the harm from not maintaining genital hygiene		
Yes	382	89.5
No	45	10.5
Knowledge grade		
Good	388	91.1
Poor	38	8.9

Table 3: Participants' Correct Responses to Practice of Personal/Genital Hygiene

Variables	Frequency (%) (n=427)
Bath three times and more a day	195 (45.7)
Clean the genital area three times or more per day	312 (73.1)
Use water only to clean the genital area	262 (61.4)
Does not use genital disinfectant	214 (50.1)
Had sexual intercourse three times or less per week	284 (66.5)
Genital cleaning before sexual intercourse	339 (79.4)
If yes, with water alone	202 (59.8)
Genital cleaning after sexual intercourse	392 (91.8)
If yes, with water alone	263 (67.1)
Do you use under wears?	370 (86.7)
Use cotton material for underwear	250 (67.6)
Use night gown during sleep	268 (62.8)
Remove pubic hair	391 (91.6)
Reason for pubic hair removal, Hygienic	275 (70.3)
Use new shaving stick or razor blade for pubic hair removal	286 (67.0)
After shaving do you use anything to prevent itching or rash?	166 (38.9)
Clean the genital with water alone after urinating	285 (66.9)
Had vaginal discharge in the last three months	139 (32.6)
Yes, took treatment for that	103 (74.1)
Use water alone to clean after defecation	206 (48.2)
I clean from forward to the back	253 (59.3)
Wash my hands before and after leaving the toilet	283 (66.3)
Grading of practice	
Appropriate	354 (82.9)
Inappropriate	73 (17.1)

Table 4: Relationship Between Sociodemographic Characteristics of Respondents and Knowledge of Personal/Genital Hygiene

Variable	Knowledge score (n=427)		P value Test statistic	OR (95% CI)
	Good n (%)	Poor n (%)		
Age group (years)				1.159 (0.593 - 2.266)
17 – 25	160 (90.4)	17 (9.6)	$\chi^2 = 0.185$ p = 0.667	
26 – 50	228 (91.6)	21 (8.4)		
Marital status				
Married	373 (92.3)	31 (7.7)	FE= NA p = 0.002	1.90 (0.073 – 0.497)
Unmarried	16 (69.6)	7 (30.4)		
Educational level				
Formal	291 (93.9)	19 (6.1)	$\chi^2 = 10.709$ p = 0.001	2.962 (1.511 – 5.837)
Informal	98 (83.8)	19 (16.2)		
Occupation of the respondents				
Gainfully employed	184 (91.1)	15 (8.9)	$\chi^2 = 0.000$ p = 0.994	0.997 (0.512 – 1.943)
Not gainfully employed	205 (91.1)	20 (8.9)		
Education of the Husband/partner				
Formal	328 (92.9)	25 (7.1)	$\chi^2 = 8.296$ p = 0.004	2.796 (1.356 – 5.766)
Informal	61 (82.4)	13 (17.6)		
Occupation of the husband				
Gainfully employed	331 (91.2)	32 (8.8)	$\chi^2 = 0.021$ p = 0.885	1.070 (0.428 – 2.673)
Not gainfully employed	58 (90.6)	6 (9.4)		
Parity				
Primigravida	64 (91.4)	6 (8.6)	$\chi^2 = 0.011$ p = 0.916	0.952 (0.382 – 2.371)
Multigravida	325 (91.0)	32 (9.0)		

Table 5: Predictors of Knowledge of Genital Hygiene

Variables	aOR	Knowledge of genital hygiene 95% Confidence Interval		p value
		Lower	Upper	
Marital status (Married* Vs Unmarried)	0.207	0.076	0.566	0.002
Educational level of the respondents (Formal* vs informal)	0.405	0.177	0.929	0.033
Educational level of the husband (Formal* vs informal)	0.707	0.286	1.745	0.452
Formal education = primary, secondary and tertiary, informal = none. *Reference value, aOR- adjusted odds ratio				

Table 6: Relationship Between Sociodemographic Characteristics of Participants and Practice of Personal/Genital Hygiene

Variable	Practice grading (n=427)		Test statistic P value	OR (95% CI)
	Appropriate n (%)	Inappropriate n (%)		
Knowledge of genital hygiene				
Good	367 (94.3)	22 (5.7)	Fisher's exact = NA	3.767 (1.492 – 9.511)
Poor	31 (81.6)	7 (18.4)	p = 0.009	
Age group (years)				
17 – 25	165 (93.2)	12 (6.8)	$\chi^2 = 0.001$	0.997 (0.464 – 2.143)
26 – 50	233 (93.2)	17 (6.8)	p = 0.993	
Marital status				
Married	381 (94.3)	23 (5.7)	Fisher's exact = NA	0.171 (0.062 – 0.475)
Unmarried	17 (73.9)	6 (26.1)	p = 0.003	
Educational level				
None	99 (84.6)	18 (15.4)	$\chi^2 = 18.798$	4.942 (2.257 – 10.22)
Formal	299 (96.5)	11 (3.5)	p < 0.001	
Occupation of the participants				
Gainfully employed	197 (97.5)	5 (2.5)	$\chi^2 = 11.282$	4.704 (1.760 – 12.577)
Not gainfully emplyd	201 (89.3)	24 (10.7)	p = 0.001	
Education of the Husband/partner				
None	61 (82.4)	13 (17.6)	$\chi^2 = 16.420$	4.489 (2.056 – 9.802)
Formal	337 (95.5)	16 (4.5)	p < 0.001	
Occupation of the husband				
Gainfully employed	347 (95.6)	16 (4.4)	$\chi^2 = 21.741$	5.528 (2.512 – 12.164)
Not gainfully emplyd	51 (79.7)	13 (20.3)	p < 0.001	
Parity				
Primigravida	62 (88.6)	8 (11.4)	$\chi^2 = 2.844$	2.065 (0.875 – 4.870)
Multigravida	336 (94.1)	21 (5.9)	p = 0.92	

χ^2 = Pearson's Chi square test, NA – Not available, p = p value (0.05)

χ^2 = Pearson's Chi square test, NA – Not available, p = p value (0.05)

Practice of Personal and Genital Hygiene

Most, 354 (82.9%) of the participants had an appropriate practice of personal and genital, and more than half used cotton material for underwear and water only to wash the genital area 250 (67.6) and 262 (61.4), respectively. (Table 3).

There was statistically significant association between knowledge of genital hygiene and marital status $p = 0.002$; participants who were married had a significantly better knowledge (92.3%) of genital/personal hygiene compared to those who were not. Similarly, those with formal education had significantly ($p = 0.001$) better knowledge (93.9%) than those who were not (Table 4). Participants' marital status and educational levels were found to be predictors of

knowledge, as those who were unmarried were 5 times less likely to have good knowledge of genital hygiene as compared to those who were married (aOR = 0.207, $p = 0.002$, 95%CI = 0.076 – 0.566). Participants who had no formal education were 2.5 times less likely to have good knowledge of genital hygiene as compared to those have formal education (aOR = 0.405, $p = 0.033$, 95%CI = 0.177-0.929) (Table 5).

There was a statistically significant association between participants' knowledge of genital hygiene ($p = 0.009$), marital status ($p = 0.003$), educational level ($p < 0.001$), occupation ($p = 0.001$), spouses' education ($p < 0.001$), spouses' occupation ($p < 0.001$) and practice of genital hygiene. Participants who had formal education (96.5%) were involved in more appropriate practice than those not educated. Similarly, the proportion of

Table 7: Determinants of Personal/Genital Hygiene Practice Among Respondents

Variables	aOR	Practice of Genital Hygiene		p value
		95% Confidence Interval		
		Lower	Upper	
Marital status (married vs unmarried*)	0.207	0.051	0.845	0.028
Educational level of the respondents (Formal vs informal*)	0.375	0.147	0.957	0.040
Occupation of the respondents (employed vs unemployed*)	0.317	0.110	0.913	0.033
Occupation of the husbands (employed vs unemployed*)	0.321	0.132	0.784	0.013

Formal education = primary, secondary and tertiary, informal = none. Employed = civil servant, farmer, business, others, unemployed = house wife, student. *Reference value, aOR- adjusted odds ratio

participants whose husbands were gainfully employed was higher than those not employed (Table 6). Participants' marital status, educational level, occupation and that of the husbands were found to be the predictors of genital and personal hygiene practices, as participants with formal education were 0.4 times more likely to have a better practice of personal/genital hygiene (aOR = 0.0375, 95%CI = 0.147 – 0.957. p = 0.040) (Table7)

DISCUSSION

In this study, we assessed the knowledge and practice of pregnant women on personal and genital hygiene. More than half of the respondents were between the ages of 21 and 30 years; it is not surprising because, in the study area, which is in northwest Nigeria, most women marry before or by 18 years of age and expected to start childbearing in their early 20s, this contrasts the findings in Lagos where a high proportion of the respondents were in their 30s indicating that they must have married a little late compared to what was obtainable in the north(13). The study also revealed that most of the respondents were married. This is not unexpected as most cultures/traditions and religions in Nigeria mandate couples to be married before having children; a similar finding was reported in another part of Nigeria.

Most of the respondents in the study were aware of personal and genital hygiene and confirmed receiving such information from healthcare workers during ANC. This is in conformity with what was reported in a previous study from Turkey, where the majority of the study participants received information about genital hygiene from healthcare professionals (5, 6). However,

in contrast to this finding, a study from Cameroon noted that more than half of the respondents admitted to receiving information on genital hygiene from family members. (10) Good knowledge of personal and genital hygiene was demonstrated by the majority of the respondents, most of whom believed to have known the requirements for both personal and genital hygiene and knew the harm that could arise from not maintaining proper genital hygiene. This could be attributed to the high literacy level observed among the respondents. A significant finding from this study was the fact that the proportion of respondents with good knowledge of genital and personal hygiene was higher among those with formal as compared to those with informal education. Other studies also reported similar findings where the study participants with higher education exhibited a good understanding of genital hygiene (13, 14). In contrast to our findings, a similar study from Kenya reported that barely half of the women attending ANC clinic had moderate knowledge of personal and genital (15).

Appropriate genital and personal hygiene practices were reported by most of the respondents in this study, where a high proportion of the respondents reported washing their genital area more than three times a day and using water only, indicating that there may be fewer chances of genital infection developing among the pregnant women. This is in line with previously reported findings of good hygiene practices among pregnant women (10, 13-15). Even though most women desire genital cleaning and see it as an important aspect of hygiene, the current study revealed an interesting finding when only a few of the respondents admitted using antiseptic in genital cleaning. This finding may not be

unrelated to the fact that some women may consider antiseptic to be irritating to the genital area or might have been warned against its use during ANC.

A study by Fashemi et al. suggested that some vaginal cleansing products may be harmful to *Lactobacillus* bacteria and alter the vaginal immune environment (16). Once the normal flora of the genitalia is altered, it becomes a safe haven for various microorganisms to flourish and wreak havoc in the forms of various infections with far-reaching effects. A similar study conducted in Cameroon observed that only a few women used antiseptic in genital cleaning. (10) More than half of the respondents in our survey admitted having coitus three times or less in a week; this is hygienically good as frequent sexual intercourse is reported to increase the risk of urinary tract infection among pregnant women (17) and also associated with recurrent cystitis (18, 19). As part of good hygiene practice, most of the respondents in our study used cotton underwear, which is reported to reduce the risk of genital infection. Cotton underwear absorbs perspiration, keeps the perineum dry and makes it less likely for genital tract infections to develop (20).

A study in Turkey showed that the rate of wearing cotton linen was found to be below average (21). Our study revealed that participants' marital status and the occupation of their spouses were the predictors of personal and genital hygiene practices, and this is not unexpected as the more educated an individual is, the more likely that he/she is aware of health protection and promotion behaviors; this conforms with the findings of a previous study (21). Another study observed that the lack of a regular source of water supply and the distance to the source of water supply were among the factors that affected practices of personal hygiene among the respondents (13).

CONCLUSION

Respondents in this study demonstrated a high level of awareness and knowledge of personal and genital hygiene, and most of them got the information from healthcare workers; a high proportion of the respondents reported having appropriate practice of personal and genital hygiene. The marital/educational statuses of the respondents, as well as the occupation of their spouses, were the determinants of knowledge and practice of personal/genital hygiene. There is an urgent need for public enlightenment and sensitization to create more awareness of personal/genital hygiene. Improving women's literacy level and empowering them will improve their knowledge and practice of hygiene.

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Conflict of Interest

The authors declare that they have no conflicts of interest with respect to this paper.

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Authors Contribution

MOO conceived the study and reviewed the entire work, ZAK and SB participated in the design of the study, data collection and drafting of the manuscript, HA and MY participated in data analysis and interpretation, AZE and AMD wrote the discussion and reviewed the analyzed data. All authors read and approved the work and each author believes that the manuscript represents honest work.

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