



Healthcare Workers Knowledge and Attitude towards Prevention of Obstetric Fistula

Oluwasomidoyin Olukemi Bello^{1*} and Olatunji O. Lawal¹

¹Urogynaecology Unit, Department of Obstetrics and Gynaecology, University College Hospital, Ibadan, Nigeria.

Authors' contributions

This work was carried out in collaboration between both authors. Author OOB designed the study, performed the statistical analysis, wrote the protocol, the first and final draft of the manuscript. Author OOL managed the analyses of the study, wrote the first and final draft of the manuscript. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/IJRRGY/2018/45352

Editor(s):

(1) Dr. Sevgul Donmez, Faculty of Health Sciences, Gaziantep University, Turkey.

Reviewers:

(1) Naoki Hashimoto, Kindai University, Japan.

(2) Mohammed Ismail Khan, ESIC Medical College, India.

Complete Peer review History: <http://www.sciencedomain.org/review-history/27636>

Original Research Article

Received 11th September 2018

Accepted 22nd November 2018

Published 5th December 2018

ABSTRACT

Background: Obstetric fistula (OF) is a preventable devastating condition mostly caused by prolonged obstructed labour and the healthcare workers (HCWs) plays a key role in its prevention.

Objective: To determine the knowledge and attitude of HCWs towards OF prevention at all levels of health care facilities in Ibadan, Nigeria.

Methods: This was a facility based cross-sectional study among 171 HCWs providing obstetric care in the primary, secondary and tertiary health centres. A self-administered questionnaire was used to gather information on their knowledge and attitude towards prevention of OF. Data was analysed using SPSS 20.0 with a level of statistical significance set at $p < 0.05$ and 95% confidence interval. The main outcome was the HCWs level of knowledge and attitude towards OF prevention. The association between HCWs knowledge and attitude and their socio-demographics and professional characteristics were also identified using logistic regression.

Results: Mean age of respondents' was 36.5 (SD= 9.3 years). Higher proportion (42.7%) of the HCWs are practising at tertiary health centre with more than one third (36.3%) of the HCWs' practising for more than 10 years. Very few 13.5% of the respondents had good knowledge of OF

prevention while 91.2% of them had a positive attitude towards OF prevention. Sex, cadre, educational status and health facility of practice were found to be significantly associated with the HCWs knowledge of OF prevention ($p < 0.05$). HCWs with MBBS/FWACS/FMCOG educational status were about four times more likely to have good knowledge of OF prevention compared to those with other educational status (OR=3.970, 95% CI=1.050-15.004).

Conclusion: Although, the HCWs studied have poor knowledge, they showed a positive attitude towards OF prevention with their educational status as an assessor of their good knowledge of the condition. Both good knowledge and positive attitude of HCWs are vital to OF prevention.

Keywords: Attitude; healthcare worker; knowledge; obstetric fistula; prevention.

1. INTRODUCTION

Obstetric fistula (OF), a preventable condition of immense public health importance which occurs when a woman leak urine or faeces through the vagina following a difficult labour rendering her debilitated with physical, mental, psychological and social problems [1]. The main cause of OF is prolonged obstructed labour (POL) which is a reflection of the poor state of emergency obstetric care (EmOC) in developing nations with associated high still birth [2,3]. Risk factors for obstructed labour include cephalopelvic disproportion, early marriage, early childbirth, malnutrition with underdeveloped pelvis, poor health seeking behaviour and cultural practises like gishiri cut (incision made from the anterior vaginal wall and extended backwards to the perineum in an attempt to widen the vagina and this is used traditionally to treat dyspareunia, pelvic organ prolapse, obstructed labour, infertility, and urinary retention) [4,5]. OF can also occur following instrumental vaginal or caesarean delivery, hysterectomy for ruptured uterus or destructive operation by unskilled or poorly skilled personnel which are termed iatrogenic OF [6,7].

In Sub-Saharan Africa (SSA), the lifetime prevalence of OF symptoms is estimated as 3 per 1,000 women in reproductive age with the greatest burden in Nigeria which has about 200,000 existing cases besides the 12,000 new cases annually [5,8]. With this heavy burden, it might take approximately 30 years to treat the back log of existing cases of OF, therefore, the need to explore the knowledge and attitude towards its prevention [9]. OF is preventable by identifying the risk factors and causes as well as ensuring prompt medical intervention especially EmOC when needed. This holistic approach can be executed through the HCWs roles in counselling, promotion of family planning, provision of quality obstetric care, management of labour and delivery including judicious use of partograph with identification of danger signs,

prompt referral, provision of EmOC and putting up good attitude to health care users which are vital to eradication of OF. Additionally, the surge in the incidence of iatrogenic fistula in relation to sub-optimal care, mismanagement and poor attitude of HCWs documented in several studies indicate the need for HCWs to have adequate knowledge and good attitude towards OF prevention at all levels of prevention – primary, secondary and tertiary [10-15].

2. METHODS

This was a cross-sectional study on 171 consenting HCWs [Doctors, Nurses, Mid-wives, Community health extension workers (CHEWs) and Community health officers (CHO)] who provide obstetrics care on daily basis using a self-administered questionnaire in the three levels of health care facilities. Ethical approval was obtained from the Oyo state ethics review committee (AD 13/479/251).

The health facilities were randomly selected and a proportional sampling of 1/6, 2/6 and 3/6 was used in the primary, secondary and tertiary health centres respectively based on their staff strength while convenience sampling was used to recruit the HCWs. A modified structured questionnaire for knowledge and attitude of HCW's assessment on OF prevention by Engender Health Fistula Care was adapted [4,16]. Information obtained included sociodemographic and professional characteristics, knowledge of OF and its prevention and their attitudes towards OF prevention. Knowledge was evaluated using a 35 stem multiple choice questions and a correct response on knowledge was scored 1 while wrong response was scored 0.

Knowledge was scored based on Banke-Thomas et al study on the knowledge of OF prevention amongst community young women where correct responses of >50% indicated good knowledge [17]. However, because this study was among

trained and certified HCWs who are more knowledgeable a higher cut-off at > 60% was set. Respondents with 21 or more ($\geq 60\%$) correct responses were classified as having good knowledge.

HCWs attitude was evaluated using a 5-point Likert type scale with each question having the same weight and mean cut-off of 4.0 and above was used for a positive attitude. Data collected was cleaned, entered and analysed using the Statistical Package for the Social Sciences (SPSS) version 20. Cross tabulations and

multivariate analysis with logistic regression was done with the level of statistical significance set at $p < 0.05$ and 95% confidence level.

3. RESULTS

The mean age was 36.5 (SD= 9.3 years) and ranged between 20 and 65 years. Almost two-third (74.3%) were females and majority (73.1%) were married. More than half (55.0%) of the HCWs' were nurses followed by doctors (31.6%), CHO (12.9%) and CHEW (0.6%) respectively.

Table 1. Descriptive analysis of respondents' socio demographic characteristics

Variable	Frequency (N=171)	Percent (%)
Age (Years)		
20-24	11	6.4
25-29	29	17.0
30-34	39	22.8
35-39	38	22.2
40-44	21	12.3
45-49	15	8.8
50-54	9	5.3
55-59	6	3.5
60-64	2	1.2
65-69	1	0.6
Sex		
Male	44	25.7
Female	127	74.3
Marital status		
Single	43	25.1
Married	125	73.1
Widowed	2	1.2
Separated	1	0.6
Cadre		
Doctor	54	31.6
Nurse	94	55.0
Community health officer	22	12.9
Community health extension worker	1	0.6
Educational status		
Registered Nurse	52	30.4
Registered Midwife	28	16.4
Bachelor of Science (BSc)	23	13.5
Master of Science (MSc)	5	2.9
Doctor of Philosophy (Phd)	1	0.6
MB;BS	47	27.5
FWACS/FMCOG	1	0.6
School of Health Hygiene	14	8.2
Health facility of practice		
Primary Health centre	30	17.5
Secondary Health Centre	68	39.8
Tertiary Health Centre	73	42.7
Years of practice		
< 1 year	26	15.2
1-3 years	24	14.0
4-6 years	26	15.2
7-9 years	33	19.3
> 10 years	62	36.3

MB; BS - Bachelor of Medicine; Bachelor of Surgery; FWACS/FMCOG – Fellow West Africa College of surgeon/Fellow Medical College of Obstetrics and Gynaecology

Less than half (42.7%) of the HCWs are practising at the tertiary health centre, 39.8% and 17.5% are practising at secondary and primary health centres respectively. More than one third (36.3%) of the HCWs' had been practising for more than 10 years, 19.3% for 7-9 years and 15.2% for less than 1 year (Table 1).

Majority (88.3%) could identify POL as the commonest risk factor/cause of OF and above half (56.1%) of the respondents identified all the stated contributing factors to maternal mortality and morbidity including OF. The common complications of prolonged and/or obstructed labour were correctly identified by about 58.5% of the respondents while 19.3% of them identified OF as the only common complication. However, less than half (42.1%) rightly identified the impact inadequate nutrition can have on a woman's health (Table 2).

Only 13.5% of the HCWs had good knowledge. The HCWs cadre, sex, educational status and health facility of practice were found to be statistically significantly associated with their knowledge on OF prevention ($p < 0.001$). Among

the doctors, above a third of them had good knowledge about OF prevention; but this was lower among the nurses and other HCWs. Also, a higher proportion (11.7%) of the HCWs with postgraduate qualifications had good knowledge. Comparing their level of knowledge based on their health facility of practice 1.8%, 2.3% and 9.4% had good knowledge of OF prevention in the primary, secondary and tertiary health facility respectively which was statistically significant ($p = 0.017$). Higher proportion of the males 7.6% had good knowledge compared to only 5.8% of the females with good knowledge of OF prevention ($p = 0.001$) (Table 3).

Almost all 91.2% of the HCWs had positive attitude towards OF prevention. All the HCWs characteristics were not statistically associated with their attitude towards OF prevention.

Majority, (62.0%) of the respondents less than 40 years of age had positive attitude towards OF prevention and more (69.0%) of the female HCWs had positive attitude towards OF prevention compared to the males (22.2%).

Table 2. Descriptive analysis of knowledge of HCWs about causes/risk factors of OF

Variable	Frequency	Percent (%)
The most common reason women develop obstetric fistula		
Female genital mutilation	5	2.9
Sexual violence	8	4.7
<i>Prolonged /obstructed labour</i>	151	88.3
Accidental injuries during surgeries or episiotomy	6	3.5
Missing	1	0.6
Common complication of prolonged/ and obstructed labour		
Avascular necrosis of the symphysis pubis	1	0.6
Nerve compression which can result in foot drop	19	11.1
Scarring in the vagina leading to vaginal stenosis	12	7.0
Obstetric fistula	33	19.3
<i>All of the above</i>	100	58.5
Missing	6	3.5
Inadequate nutrition can impact a woman's health by:		
Causing short stature and misshapen pelvic bone.	12	7.0
Increasing risk of anaemia.	75	43.9
Interfering with reproductive hormones, her menstrual cycle and the health of pregnancies.	10	5.8
<i>All of the above</i>	72	42.1
Missing	2	1.2
Factors that contribute to maternal mortality and morbidity including obstetric fistula are:		
A. Lack of equipped health facilities and trained providers.	15	8.8
B. Low status of women.	4	2.3
C. Delay in decision to seek care, reaching care and receiving care.	12	7.0
D. Geographic barriers and lack of transportation.	2	1.2
<i>All of the above</i>	96	56.1
A, C and D only	41	24.0
Missing	1	0.6

NB: no multiple responses and the most appropriate correct responses highlighted in Italics

Table 3. Bivariate analysis of HCWs sociodemographics and professional characteristics with knowledge on OF prevention

Variable	Knowledge (%)		Total	Chi-square	P-value
	Good	Poor			
Age					
≤39	18 (10.5)	99 (57.9)	117 (68.4)	1.191	0.275
≥40	5 (2.9)	49 (28.7)	54 (31.6)		
Sex				13.184	0.001**
Male	13 (7.6)	31 (18.1)	44 (25.7)		
Female	10 (5.8)	117 (68.4)	127 (74.3)		
Marital status				0.009	1.000**
Married	17 (9.9)	108 (63.2)	125 (73.1)		
Others	3 (3.5)	40 (23.4)	46 (26.9)		
Cadre				37.717	<0.001**
Doctors	20 (11.7)	34 (19.9)	54 (31.6)		
Nurses and others	3 (1.8)	114 (66.7)	117 (68.4)		
Educational status				33.353	<0.001**
Nurses and others	3 (1.8)	110 (64.3)	113 (66.1)		
Post graduate	20 (11.7)	38 (22.2)	58 (33.9)		
Health facility of practice				8.148	0.017**
Primary health centre	3 (1.8)	27 (15.8)	30 (17.5)		
Secondary health centre	4 (2.3)	64 (37.4)	68 (39.8)		
Tertiary health centre	16 (9.4)	57 (33.3)	73 (42.7)		
Years of practice				0.010	0.920
≤3 years	10 (5.8)	66 (38.6)	76 (44.4)		
≥4 years	13 (7.6)	82 (40.0)	95 (55.6)		

**Fishers exact

Table 4. Analysis of HCWs sociodemographics and professional characteristics with attitude of HCWs towards OF prevention

Variable	Attitude (%)		Total	Chi-square	P-value
	Positive	Negative			
Age					
≤39	106 (62.0)	11 (6.4)	117 (68.4)	0.184	0.668**
≥40	50 (29.2)	4 (2.3)	54 (31.6)		
Sex				1.752	0.186
Male	38 (22.2)	6 (3.5)	44 (25.7)		
Female	118 (69.0)	9 (5.3)	127 (74.3)		
Marital status				3.267	0.071
Married	117 (68.4)	8 (4.7)	125 (73.1)		
Others	39 (22.8)	7 (4.1)	46 (26.9)		
Cadre				0.540	0.463
Doctors	48 (28.1)	6 (3.5)	54 (31.6)		
Nurses and others	108 (63.2)	9 (5.3)	117 (68.4)		
Educational status				0.271	0.602
Nurses and others	104 (60.8)	9 (5.3)	113 (66.1)		
Post graduate	52 (30.4)	6 (3.5)	58 (33.9)		
Health facility of practice				0.391	0.822**
Primary health centre	28 (16.4)	2 (1.2)	30 (17.5)		
Secondary health centre	61 (35.7)	7 (4.1)	68 (39.8)		
Tertiary health centre	67 (39.2)	6 (3.5)	73 (42.7)		
Years of practice				0.033	0.856
≤3 years	69 (40.4)	7 (4.1)	76 (44.4)		
≥4 years	87 (50.9)	8 (4.7)	95 (55.6)		

**Fishers exact

Comparing the attitude of the HCWs based on their educational status, higher proportion (60.8%) of the nurses and midwives had positive attitude compared to the HCWs who had post graduate qualification 30.4%. Likewise, there was no statistically significant association between health facilities of practice and attitude towards OF prevention however; the HCWs

Table 5. Multivariate analysis of knowledge and attitude of HCWs on OF prevention

Variable	Odd ratio (OR)	P value	95% CI
Sex			
Male	2.239	0.190	0.670-7.487
Female (ref)	-	-	-
Educational status			
MB;BS/FWACS/FMCOG	3.970	0.042	1.050-15.004
Others (ref)	-	-	-
Health facility of practice			
Primary Health centre	1.288	0.753	0.268-6.197
Secondary Health Centre	0.345	0.092	0.100-1.189
Tertiary Health Centre (ref)	-	-	-

*MB; BS - Bachelor of Medicine; Bachelor of Surgery; FWACS/FMCOG – Fellow West Africa College of surgeon/Fellow Medical College of Obstetrics and Gynaecology

practicing in the tertiary health facilities had a higher proportion (39.2%) of positive attitude compared to those practicing in the secondary health facility and primary PHC with 35.7% and 16.4% respectively. All at $p > 0.05$ (Table 4).

The doctors were about four times more likely to have good knowledge of OF prevention compared to HCWs with other qualifications (OR=3.970; 95%CI=1.050-15.004) (Table 5).

4. DISCUSSION

This study aimed at determining the knowledge and attitude of HCWs in Ibadan on OF prevention in order to recommend actions to address the high rate of OF in Nigeria.

Majority of the HCWs were between 25-44 years with female predominance and nurses/midwives constitute more than half of the study population. This is similar to reports from other studies among HCWs that practice obstetrics and the national health report in Nigeria - "Health Work Force Country Profile of Nigeria" [18-21]. This was not unexpected as more than half of the HCWs' were from primary and secondary health facilities where nurses/midwives constitute the bulk of their work force and most midwives are female. This was also reflected in the educational status where about half of the respondents were registered nurses/midwives.

In this study, about half of the HCWs had knowledge of underlying risk factors/causes of OF and majority (88.3%) correctly identified POL as the major risk factor for OF. This is similar to the findings in a study among nurses/midwives in Ethiopia with majority (84.5%) recognising early identification of obstructed labour as a preventive measure for OF and childhood malnutrition and early marriage as a predisposing factor. In

addition, further assessment of individual causes of POL showed about half of the HCWs' correctly identified the common complications of prolonged/obstructed labour, predisposing factors that indirectly impact on the causes of OF such as malnutrition, the three levels of delay, and other factors that contribute to maternal mortality and morbidity [22-25]. This knowledge gap on the individual causes of OF among HCWs may be attributed to lack or inadequate training on OF prevention among those that offer obstetrics care.

The HCWs identified factors such as lack of equipped health facilities and trained providers, low socioeconomic status of women, delay in decision to seek care, reaching care and receiving care, geographic barriers and lack of transportation as contributing factors to maternal mortality and morbidity as risk factors for OF. These findings support Mselle et al and Melah et al report from studies in Tanzania and northern Nigeria where similar contributing factors were identified [14,26].

In this study there was deficiency in the HCWs knowledge of OF prevention evident by more than half of the HCWs having poor knowledge of OF prevention. This deficiency in the overall HCWs knowledge on OF prevention despite their educational qualifications corroborate reports from different studies that showed educated HCWs lacked adequate knowledge of fistula and identified mismanagement at health facilities and lack of trained HCWs as factors for development of OF [11,27-28]. This could be because of lack or inadequate training opportunities on OF prevention especially for those who do not specialise in pregnancy and delivery complications but offer obstetrics care because of the practice of task shifting in related fields.

The higher level of education and cadre was significantly associated with good knowledge. Doctors and other HCWs' with postgraduate education had a higher proportion with good knowledge of OF prevention compared to those who belonged to other cadres and lower degrees. The doctors and those with postgraduate education were also about four times more likely to have good knowledge of OF prevention compared to HCWs with other educational qualifications. This is similar to findings by Saeed et al in Ghana where an increase in educational status was associated with an increase in awareness level of fistula [29]. The observed finding is expected because the higher the level of a person's education, the more and broader the knowledge amassed. This contrasted with an Ethiopian study where a higher proportion of SBAs with midwife diploma had good knowledge of OF prevention and was followed by those with nursing degrees and master's qualifications [22]. These discrepancies may be attributed to differences in methods by which knowledge was assessed in both studies as well as variations in qualifications and study curriculum in Nigeria and Ethiopia.

In addition, HCWs practicing in the tertiary health facility had a higher proportion with good knowledge of OF. This buttresses the findings of inadequate knowledge of OF among the HCWs at the lower level health facilities in northern and southern Nigeria [28]. This trend is expected as HCWs in tertiary health facilities have higher educational qualifications, are more skilled and proficient based on the composition of their staff compared to PHCs which on the recommendation of the National Primary Health Development Agency consists mainly of HCWs with lower levels of qualifications such as community health officer (CHO), community health extension officer (CHEW) and Nurse/Midwives [30].

Though there was no socio demographic or professional characteristics found to be associated with the HCWs attitude towards OF prevention, almost all had positive attitude towards OF prevention. Similarly, a study that assessed the practice of nurses/midwives towards OF prevention reported two third (66.2%) of their respondents had good practice [22]. This might possibly be because this study explored the attitude of all the cadres of HCWs while their study assessed the practice of only the nurses/midwives.

The high number of HCWs with a positive attitude towards OF is of great advantage as this could translate to their proper interaction and handling of women in labour. This positive attitude could have a positive effect on obstetrics services especially intrapartum care.

The strengths in this study lies in the fact that the data is representative of HCWs of the state cutting across different cadres, all levels of health care and using the same data collection tool thus supporting its generalisability. In addition, this is the first study in Nigeria to the best of our knowledge that assessed the knowledge and attitude of HCWs towards prevention of OF thus it will fill the knowledge gap which is crucial to the eradication of OF and provide baseline reference for further research on the knowledge and attitude of all cadres of HCWs towards OF prevention. However, a limitation in this study was in the small sample size. A larger sample size in different geopolitical zone in the country would give a better reflection of the true knowledge and attitude of HCWs towards OF prevention in the country at large. Also, it will allow for separation of different cadres due to discrepancies in their training curriculum and increase the statistical power of the study. Additionally, a mixed method (quantitative and qualitative) will give opportunity to assess the in-depth knowledge and attitude of HCWs on OF prevention.

5. CONCLUSION

The overall findings of poor knowledge of HCWs towards OF prevention could explain the reason for the increase in new cases of OF because good knowledge and positive attitudes of HCWs is crucial to the prevention and eradication of OF. Therefore, it is pertinent for all HCWs to be trained and re-trained on knowledge reorientation. In addition access to standard fistula prevention training manual with evaluation of their knowledge on this from time to time will enhance quality obstetrics healthcare. The medical and nursing schools/universities should also revise their training curriculum on OF prevention so as to improve the HCWs knowledge.

CONSENT

A written informed consent was obtained from all the participants.

ETHICAL APPROVAL

Ethical approval was obtained from the Oyo state ethics review committee with approval number AD 13/479/251.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. World Health Organization (WHO). Obstetric fistula: Guiding principles for clinical management and program development; 2006. Available:http://whqlibdoc.who.int/publications/2006/9241593679_eng.pdf (Accessed 3 February 2016)
2. Roka Z, Akech M, Wanzala P, Omolo J, Gitta S, Waiswa P. Factors associated with obstetric fistulae occurrence among patients attending selected hospitals in Kenya, 2010: A case control study. *BMC Pregnancy Childbirth*. 2013;28:56. doi.org/10.1186/1471-2393-13-56
3. Hawkins L, Spitzer R, Christoffersen-Deb A, Leah J, Mabeya H. Characteristics and surgical success of patients presenting for repair of obstetric fistula in western Kenya. *Int J Gynaecol Obstet*. 2013;120:178-82. doi.org/10.1016/j.ijgo.2012.08.014
4. Fistula Care. Prevention and recognition of obstetric fistula training package: Participant handbook. Chapel Hill, NC: Fistula Care/IntraHealth International; 2012. Available:<https://www.medbox.org/prevention-and-recognition-of...fistula.../download.pdf> (Accessed 18 July 2016)
5. Ijaiya MA, Rahman A, Aboyeji PA, Olatinwo A, Esuga S, Ogah O, Raji H, Adebara I, Akintobi A, Adeniran A. Vesicovaginal fistula: a review of Nigerian experience. *West Afr J Med*. 2010;29:293-98. PMID: 21089013.
6. Raassen TJ, Ngongo CJ, Mahendeka MM. Iatrogenic genitourinary fistula: an 18-year retrospective review of 805 injuries. *Int Urogynecol J*. 2014;25:1699-1706. DOI: 10.1007/s00192-014-2445-3.
7. Maheu-Giroux M, Filippi V, Samadoulougou S, Castro MC, Maulet N, Meda N, Kirakoya-Samadoulougou F. Prevalence of symptoms of vaginal fistula in 19 sub-Saharan Africa countries: A meta-analysis of national household survey data. *Lancet Global Health*. 2015; 3:e271-78. DOI: 10.1016/S2214-109X(14)70348-1
8. Nigeria Ministry of Health (Nigeria MOH). National Strategic Framework for the Elimination of Obstetric Fistula in Nigeria: 2011-2015. Abuja, Nigeria; 2012. Available:https://fistulacare.org/archive/files/5/5.4/Nigeria_National_Strategy_2011-2015.pdf (Accessed: 28 December 2016)
9. Daru PH, Karshima JA, Mikah S, Nyango D. The burden of vesico-vaginal fistula in North central Nigeria. *J West Afr Coll of Surg*. 2011;1:50-62. PMID: 25452953.
10. Barageine JK, Tumwesigye NM, Byamugisha JK, Almroth L, Faxelid E. Risk Factors for Obstetric Fistula in Western Uganda: A Case Control Study. *PLoS ONE*. 2014;9:e112299. doi.org/10.1371/journal.pone.0112299
11. Phillips BS, Ononokpono DN, Udofia NW. Complicating causality: Patient and professional perspectives on obstetric fistula in Nigeria. *Cult Health Sex*. 2016; 18:996-1009. DOI: 10.1080/13691058.2016.1148198
12. Onsrud M, Sjøveian S, Mukwege D. Cesarean delivery-related fistulae in the Democratic Republic of Congo. *Int J Gynaecol Obstet*. 2011;114:10-14. DOI: 10.1016/j.ijgo.2011.01.018
13. Mselle L, Moland K, Mvungi A, Evjen-Olsen B, Kohi T. Why give birth in health facility? Users' and providers' accounts of poor quality of birth care in Tanzania. *BMC Health Serv Res*. 2013;13:174. DOI: 10.1186/1472-6963-13-174
14. Mselle L, Kohi T, Mvungi A, Evjen-Olsen B, Moland K. Waiting for attention and care: birthing accounts of women in rural Tanzania who developed obstetric fistula as an outcome of labour. *BMC Pregnancy Childbirth*. 2011;11:75. doi.org/10.1186/1471-2393-11-75
15. Mselle LT, Kohi TW. Perceived health system causes of obstetric fistula from accounts of affected women in rural Tanzania: A qualitative study. *Afr J Reprod Health*. 2015;19:124-32. PMID: 26103702.
16. Fistula Care. Urinary Catheterization for Primary and Secondary Prevention of

- Obstetric Fistula: Report of a Consultative Meeting to Review and Standardize Current Guidelines and Practices, March 13-15 at the Sheraton Hotel, Abuja, Nigeria. New York: EngenderHealth/Fistula Care; 2013.
Available:http://pdf.usaid.gov/pdf_docs/PA00JFDJ.pdf
(Accessed 14 July 2016)
17. Banke-Thomas AO, Kouraogo SF, Siribie A, Taddese HB, Mueller JE. Knowledge of obstetric fistula prevention amongst young women in Urban and Rural Burkina Faso: A Cross-Sectional Study. *PLoS ONE*. 2013;e85921.
doi.org/10.1371/journal.pone.0085921
 18. Labiran A, Mafe M, Onajole B, Lambo E. Health Work Force Country Profile of Nigeria; 2008.
Available:www.afro.who.int/index.php?option=com_docman&task=doc_download
(Accessed 1 March 2017)
 19. Arulogun O, Okereke C. Knowledge and practices of intermittent preventive treatment of malaria in pregnancy among health workers in a southwest local government area of Nigeria. *J Med Med Sci*. 2012;3:415-22.
 20. Mathew L. Where have all the good men gone? A discussion about men in the field of obstetrics and gynaecology. *UTMJ*. 2012;89:115-17.
 21. Fawole AO, Hunyinbo KI, Adekanle DA. Knowledge and utilization of the partograph among obstetric care givers in south west Nigeria. *Afr J Reprod Health*. 2008;12:22–29.
PMID: 20695151.
 22. Legesse M. Knowledge and practice on prevention of obstetric fistula among skilled birth attendants in public health centers in Addis Ababa, Ethiopia. *Int J Dev Res*. 2016;6:10072-79.
 23. Nnebue CC, Ebenebe UE, Adogu PO, Adinma ED, Ifeadike CO, Nwabueze AS. Adequacy of resources for provision of maternal health services at the primary health care level in Nnewi, Nigeria. *Niger Med J*. 2014;55:235-41.
DOI: 10.4103/0300-1652.132056
 24. Kasamba N, Dan K, Scovia N. Community awareness about risk factors, presentation and prevention and obstetric fistula in Nabitovu village, Iganga district, Uganda. *BMC Pregnancy Childbirth*. 2013;13:229.
doi.org/10.1186/1471-2393-13-229
 25. Nambala N, Mweemba P, Labib M. Women's Intention to Prevent Vesico Vaginal Fistula Recurrence in Two Repair Centres in Zambia. *Med J Zam*. 2012; 39:54-58.
 26. Melah GS, Massa AA, Yahaya UR, Bukar M, Kizaya DD, El-Nafaty AU. Risk factors for obstetric fistulae in north-eastern Nigeria. *J Obstet Gynaecol*. 2007;27:819-23.
doi.org/10.1080/01443610701709825
 27. Ngoma J. Prevention of vesicovaginal fistula– a literature review and experience from Zambia. Dissertation, Turku University of Applied Sciences; 2010. Available:<https://publications.theseus.fi/bitstream/handle/10024/26462/Josephine%20ngoma%20thesis.pdf?sequence=1>.
(Accessed 8 March 2017)
 28. Warren CE, Agbonkhese R, Ishaku, SM. formative research on assessing barriers to fistula care and treatment in Nigeria; 2016.
Available:http://www.popcouncil.org/uploads/pdfs/2016RH_FistulaCare_Nigeria.pdf.
(Accessed 9 January 2017)
 29. Saeed M, Alhassan A, Opare-Asamoah K, Kuubiere C. A survey on obstetric fistula awareness in Northern Ghana. *Euro J Exp Bio*. 2014;4:178-82.
 30. National Primary Health Care Development Agency (NPHCDA). Minimum Standard for Primary Health Care in Nigeria; 2016.
Available:<http://www.nphcda.gov.ng/Reports%20and%20Publications/Minimum%20Standards%20for%20Primary%20Health%20Care%20in%20Nigeria.pdf>
(Accessed 5 March 2017)

© 2018 Bello and Lawal; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:

<http://www.sciencedomain.org/review-history/27636>