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Uptake of skilled birth deliveries in women of reproductive age: Results of a cross-sectional survey following implementation of free maternal services in Nyatike Sub-County, Kenya

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Abstract
Background: *As is the trend globally, in Kenya, maternal mortality ratio remains high at 546/100,000 and 362/100,000 live births, respectively. Approximately 830 women die from pregnancy- or childbirth-related complications around the world every day, with 88% of these deaths occurring in Africa and Asia. In Kenya, skilled birth attendants (SBA) is estimated at 62% while in Nyatike Sub-County, it is 68%. The factors influencing skilled birth attendants are still largely unknown in Nyatike despite the government provision of free maternal services.*
Methods: *Across-sectional study was carried among367 women aged 15-49 years old who had a live birth and living in Nyatike Sub-County. Quantitative data were collected using structured questionnaires, while qualitative data was collected from 20 key informant interviews and 6 Focus Group Discussions. Quantitative data were analysed using Chi-square test and binary logistic regression while qualitative data were analysed using content analysis.*
Results: *The prevalence of skilled delivery was 32.2% (118/367). Of the 367 women interviewed, 293 (80.3%) were aware of the nearest health facility. Amongst those who were aware of nearest health facility, (32%, n=94) utilized SBA. Women with high school education were 2.9 times more likely to use SBA (high school vs primary; OR=2.9; 95% CI=1.1-8.2, p=0.039). Women who perceived health workers' attitude to be 'very friendly' were 2.8 times more likely than those with no opinion to use SBA (40.5% vs 19.7%, OR=2.8; 95% CI=1.3-6.1, p=0.010). Only 40% of health facilities surveyed provided quality care. Choice of place of delivery was perceived to be due to availability of free professional care for both mother and baby, high standard of hygiene and equipment, free referral services if complications arise and privacy at the health facilities.*
Conclusion: *The prevalence of skilled birth delivery was generally low. Women with secondary education or higher were more likely to utilize skilled birth delivery compared to those with primary education. Overall, the attitude of health workers was significantly associated with higher odds of skilled birth delivery and a higher percentage of the health facilities provided poor quality services.*
Keywords: *Uptake, skilled birth deliveries, pregnancy, women of reproductive age.*

Introduction

Childbirth is a fundamental part of human existence. Approximately 830 women die from pregnancy- or childbirth-related complications around the world every day, with 88% of these deaths occurring in Africa and Asia. Sub-Saharan Africa suffers from the highest maternal mortality ratio – with an estimated 546 maternal deaths per 100,000 live births, or 201,000 maternal deaths a year[1].

Globally, it is estimated that 34% of mothers deliver with no skilled attendant, thus implying that there an estimated 45 million births occur at home without any skilled health personnel annually. Skilled attendants assist in more than 99% of births in developed countries as compared to 62% in developing countries[1]. Globally, the goal was to have 80% of all births assisted by skilled attendants by 2005, 85% by 2010 and 90% by 2015[2], an estimate that is yet to be achieved post-2015.

In contrast to the principles of WHO's Safe Motherhood Initiative, hospital deliveries only account for a minority of births in many regions of Sub-Saharan Africa (SSA). As a consequence, maternal mortality rates (MMR) are among the highest in SSA, comparing unfavorably with other regions that have relatively constrained resources, such as South-East Asia and South America[3].

Factors associated with unskilled deliveries include the education level and wealth of the mother, with 84% of children whose mothers have no education being born at home, relative to 30% of those whose mothers have secondary education [4]. In a study conducted in Tanzania, it was observed that improving coverage of health facilities is a necessary prerequisite for raising awareness for both men and women on danger signs during pregnancy/delivery and strengthening counselling on facility delivery and individual birth preparedness[5].

Maternal mortality and morbidity are directly and indirectly related to societal and cultural factors that impact women's health and their access to services[6]. Thus, lack of access and control over resources, limited educational opportunities, poor nutrition, and lack of decision-making contribute significantly to adverse pregnancy-related outcomes[7]. Review of the international literature implicates factors like cultural beliefs, socio-demographic status, women's autonomy, economic conditions, physical and financial accessibility, disease pattern and health service issues as important determinants of the use of maternal health care services[8]. For example, a study in India pointed out that the low utilization of maternity services seems to be due to low levels of household income, high illiteracy and ignorance, and a host of traditional factors[9]. A similar study in Pakistan described poor socio-economic status, lack of physical accessibility, cultural beliefs and perceptions, low literacy level of the mothers and large family size as the leading causes of poor utilization of primary health care services[10]. In another study from Ethiopia, it was observed that the use of maternal health services can be influenced by socio-demographic characteristics of women, cultural context, and accessibility to these services[11].

Women feel reluctant to go for health facility-delivery because of negative attitudes of the health professionals which include: poor reception, caning, shouting, and refusing to attend to women in pain (especially during weekends and at night)[12]. The women have the perception that the health facility is a harsh setting for childbirth[13]. In a study focusing on low use of skilled attendants' delivery services in rural Kenya[13], one community health worker said, *"They leave you alone during your labour pain at the health centre; the Traditional Birth Attendants (TBAs) stays with you and helps you to deal with the pain."* This perception may closely be related to and be driven by under-staffing situation of the health facilities[13]. The lack of doctors, nurses and midwives posses' serious problems for developing countries [14].

Ghana's free delivery care policy was seen as an effective approach to an important problem as was believed to have substantially increased utilization

of skilled care for delivery[12]. However, this proved to be wrong because even when the delivery-fee-exemption policy had increased utilization of delivery services, poor quality of care, low staff strength, poverty, transportation, long distances to health facilities, socio-cultural barriers, and the custom of using traditional birth attendant still remains and these hinder access to skilled delivery[15]. The Kenya National Guidelines for quality Obstetric and prenatal care, (2004) addresses needs of service provider that if met would contribute to facilitating the provision of quality services that in turn address rights of the clients. These include offering training, infrastr-ucture, supplies, guidelines, encouragement, respect and information[16].

Prevalence of skilled birth deliveries in Nyatike Sub-County in Kenya was 68% compared to national estimate of 62%[4,17]. Despite this, the factors influencing uptake of skilled birth deliveries amongst women of reproductive age in Nyatike Sub-County, Kenya remains un-established. As such, the current cross-sectional study assessed the factors influencing uptake of skilled birth deliveries amongst women of reproductive age in Nyatike Sub-County, Kenya.

Methods and Materials

Study Site

This study was conducted in Nyatike Sub-County, Migori County located between latitudes South1° 6' 51" S, North 0° 45' 34" S, and longitudes West 34° 2' 24" E, East 34° 21' 42" E with a minimal elevation of 1133m and a maximal elevation of 2254m land/water, mainland, Lake Victoria, Kenya. In Migori, 61.9% of women delivered in health facilities, 61.4% sought advice or treatment from a health facility or provider. In Nyatike Sub-County 68% of women had skilled birth deliveries in 2012[17].

Study Design

This was a descriptive cross-sectional study where both quantitative and qualitative research methods were employed. The study was carried out between June-July, 2015.

Study Population and Sampling procedures

The study population was women of reproductive age resident in Nyatike Sub-County, Health Facility in-charges, Traditional Birth Attendants (TBAs), Community Health Workers (CHWs), and health workers. The sampling unit were mothers and the inclusion criteria were those who had a live birth and permanent residents of Nyatike Sub-County within the data collection period and who provided informed consent. Mothers who did not provide informed consent were excluded from the study.

Sampling Procedure

Systematic random sampling was used to select the respondents to participate in the study.Every third woman of reproductive age who had a live birth one year before the survey was selected on a random start between 1 and the sampling interval (3) resulting in a total of 367 women of reproductive age being voluntarily recruited into the study. Purposive sampling was used to identify participants for Traditional Birth Attendants (TBAs), community health workers (CHWs), Health care Workers (HCWs)and key informants (KIs) from health facilities depending on their experience and past involvement with matters related to uptake and utilization of skilled deliveries by women of reproductive age.

Data Collection methods

Structured questionnaires were administered at the household level while KIIs were done with healthcare providers working in the Department of Maternal and Child Health (MCH) and the CHWs. A list of potential KII respondents were drawn and appointments made to interview them at the official work locations. Participants in the focused group discussions (FGDs) were reached through snow-balling and through established community health strategy structures. A FGD guide was used during discussions with TBAs, women who had a live birth and CHWs. Each FGD consisted of between 6-12 members.

Data Analysis

Data were analysed using the Statistical Package for Social Scientists (SPSS) (version 18.0). The dependent variable was defined as uptake of skilled delivery, which referred to deliveries in health facilities and assistance by health professional. The independent variables included socio-demographic characteristics (age in years, marital status, educational level, occupation, monthly income), knowledge on safe motherhood (nearest health facility, importance of facility delivery, HIV status and benefits of ANC attendances),attitude of health care staff (friendliness of health workers) and quality of skilled delivery services (22 indicators of quality of care consisting of trainings the health workers have undergone, equipment availability, presence or absence of supply stock outs and availability of night maternal services). Descriptive statistics and frequency were used to conduct univariate analysis. Binary logistic regression was used to assess the factors associated with the uptake of skilled birth attendance. Odds Ratio (OR) and 95% confidential intervals (95% CI) are reported. A$p \leq 0.05$ were considered statistically significant in all analyses. Discussions on FGDs and KIIs were recorded on audiotapes and later transcribed. Content and thematic analysis approach was used to align the views, perceptions and experiences with the objective of the study.

Ethical Considerations

This study commenced after approval had been received from the Maseno University Ethical Review Committee. Permission was also obtained from Migori County Government Department of Health, which administratively covers Nyatike Sub-County. Informed consent was obtained from all participants. For all the participants who were not able to read, they were informed about the study by translating the information into the local *Dholuo* language. All information collected were treated as confidential.

Results

Level of Knowledge on Safe Motherhood among Women of Reproductive Age

Of the 367 women interviewed, 293 (80.3%) of them were aware of the nearest health facility of skilled birth attendance (SBA) while 72 (19.7%) were not aware. Amongst those who were aware of the nearest health facility for SBA, 32% (n=94) utilized SBA as compared to 30.6% (n=22) who utilized but were not aware. However, the differences between those who were aware and those who were not aware of the nearest health facility were comparable (p=0.803). The women were further asked if they were aware of importance of health facility delivery and the result indicated that only 37.9% (n=139) knew the importance while majority 62.1% (n=228) thought health facility delivery was not important. Of those who thought it was important, 20.9% (n=29) utilized the SBA as compared to 39.0% (n=89) who utilized SBA but thought it was not important. Those who thought that the health facility delivery was more important were 50% more likely to utilize SBA (OR=0.5; 95% CI=0.4-0.8, p=0.001). The proportions between the different reasons provided for use and no use were comparable (Table 1).

Focus Group Discussion (FGDs) results

The following were the areas of focus for FGDs:

What prevents women in the community from going for skilled delivery?

Some participants' described some of the reasons that can prevent women in the community from going to dispensary as:*"Attitude of the women towards health facility", "Distance to health facility", "Availability of claimed TBA's", "Closure of health facilities at night, weekend and holidays", "Illiteracy and ignorance","Traditions and customs of community", "Lack of delivery beds in some facilities" and "Transport costs".*

The influence of socio-demographic characteristics of women of reproductive age in Nyatike Sub-County and uptake of skilled birth delivery

The age of women at time of delivery (p=0.088), monthly income (p=0.562) and marital status (p=0.705) had no influence on uptake of SBA services. However, there was significant influence of education level of the woman and utilization of SBA. Result indicated that compared to 27.4% (n=32) of women with primary education who utilized SBA services, 36.6% of those with college education were 2.9 times more likely to utilize SBA services (OR=2.9; 95% CI=1.1-8.2, p=0.029) and 52.1% of those with college level were 1.8 times more likely to utilize SBA services (OR=1.8; 95% CI=0.8-4.3, p=0.0001). Those with no education were about three times less likely to utilize SBA services compared to those with primary education (34.7% *vs* 27.4%, OR=3.1, 95% CI=1.3-7.5, p=0.009). Source of income had a significant association with utlization of SBA. For example, compared to women who were students and utilized SBA, farming women were 3 times more likely to utilize SBA (40.2% *vs* 27.3%; OR=3.0; 95% CI=1.1-4.8, p=0.023). The level of income and marital status, however, did not have any influence on utilization of skilled birth delivery (Table2).

Focus Group Discussion and Key Informant Interview Results

The themes merging from FGD with women and which were related to the place of delivery;

For health facility delivery;

[There is] "Free professional care for both mother and baby", "High standard of hygiene and equipment", "Free referral services if complications arises", "Early detection of danger signs" and "*Privacy and confidentiality"*.

The strong opposing views against health facility delivery were:

"Distance to facility" [facilities too far from houses], "Unfriendliness of the health workers", "Fear of caesarean sections".

One participant expressed strong support for TBA delivery due to:

"*Friendliness*", "*Easier to access*" *[many live nearby] and* "*Kindness*" [can offer gift after delivery].

Key Informant Interviews

Skilled deliveries and benefits attached to it: The key informant mentioned benefits of SBA and these included "*Hygiene in facility", "Low infant deaths*" and "*Early detections of complications*".

Factors associated with skilled deliveries: One of the key components affecting access to skilled delivery is "*Long distance to health facility* ", "*Poverty levels of the mothers"* and "*Existence of TBAs"* which still influenced lack of skilled delivery.

Effect of free delivery policy to skilled delivery uptake: Generally, reaction to how free delivery policy brought value addition was positive. Examples of responses included, *"Reduced maternal deaths", "Safety of infection to baby in case mother is HIV positive", "Immediate help in case of emergency",* and *"Knowledge of HIV status and turn up for antenatal care services"*.

Health Workers Attitude and Uptake of Skilled Delivery Services by Women of Reproductive Age

When we assessed the influence of friendly health workers' attitude and behaviours on utilization of SBA, the results showed that about 86% of the women utilized the SBA as compared to those who had no firm opinion (19.7%). Those who had no firm opinion on the worker's attitude and behaviours were 2.8 times less likely of utilizing SBA (OR=2.8, 95% CI=1.3-6.1, p=0.010). About 16.4% (n=56) felt the health workers were unfriendly, 18.8% felt they were very unfriendly (n=64). There was no significant difference in utilization of SBA between those who felt the attitudes of health workers were very friendly and those who felt it was very unfriendly (40.5% vs

34.4%, OR=1.3; 95%CI=0.7-2.6, *p*=0.456) (Table 3).

Quality of Skilled Delivery Services

A total of 22 variables according to Kenya National Quality Reproductive guideline (2012) were used as indicators of quality of care consisting of trainings the health workers have undergone, equipment availability, presence or absence of supply stock outs and availability of night maternal services. The sum of quality score was 22 (100%), with a mean=13.1 and median=14.

Of the 20 facilities evaluated for quality, 40% of the health facilities (8/20) provide good quality while the rest 12/20 (60%) had poor quality of care (Table 4).

Indicators for Quality of Skilled Delivery Service

Results on table 5 show indicators for quality of care in provider's perspective (n=20). Out of the 20 health providers interviewed, 7 (35%) of the health care givers in the facilities have been trained on Prentice Ambulatory Care (PAC) trainings, only 3 (15%) have received EmOC trainings, 1 (5%) have been trained on Comprehensive Emergency Obstetric Care (CEmOC) while the rest (n=9; n=45%) of the providers were trained in Manual Vacuum Aspiration (MVA). In terms of availability of the important equipment of quality of care, in all facilities (n=20), thermometers and fetoscopes were available, in 19 (95%) facilities, there were BP machines while in 18 (90%) facilities, there were baby-scales. The result further showed that 35% of the health facilities had national reproductive health policy guidelines. Others included reproductive health communication strategy implementation guide, Kenya National guideline for obstetric and prenatal care and EmOC guidelines representing 25.0%, 25.0% and 15.0%, respectively (Table 5).

Table 1: Level of Knowledge on Safe Motherhood and Association with Uptake of Skilled Birth Delivery

	Overall (N=367)	**Utilized skilled birth delivery**	**Unskilled birth delivery**	***Odds Ratio (95% CI)**	***p*-value**
Overall	n (%)	n (%)	n(%)		
Were you aware of nearest Health facility of SBD					
Yes	293 (80.3)	94(32.1)	199(67.9)	1.0[0.6-1.9]	0.803
No	72 (19.7)	22(30.6)	50(69.4)		
Do you think health facility delivery is important?					
Yes	139 (37.9)	29(20.9)	110 (79.1)		
No	228 (62.1)	89(39.0)	139(61.0)	0.5[0.4-0.8]	**0.001**
Reasons for Hospital delivery					
Access to skilled delivery					
Yes	322 (87.7)	106(32.9)	216 (67.1)	0.8[0.5-1.3]	0.400
No	45(12.3)	12(26.7)	33(73.3)		
Prevent delay in getting emergency care					
Yes	311 (84.7)	102(32.8)	209(67.2)		
No	56(15.3)	16(28.6)	40(71.4)	0.9[0.6-1.4]	0.533
Immediate treatment to the mother and baby					
Yes	313(85.3)	100(31.9)	213(68.1)		
No	54(14.7)	18(33.3)	36(66.7)	1.0[0.7-1.6]	0.841

*Logistic regression was used to assess associations. Chi-square analyses were used to compare proportions. *P*-value in bold is statistically significant.

Table 2: Influence of Socio-demographic Characteristics on Access to Skilled Delivery Services among Women of Reproductive Age

	Overall (N=367)	Utilized skilled birth delivery	Unskilled	Odds Ratio (95% CI)	*p*-value
Overall	n (%)	n (%)	n(%)		
Age In years					0.884[a]
Less than 15	67	18(26.9)	49(73.1)	1.0[0.4-2.7]	0.933
15-20	72	22(30.6)	50(69.4)	Ref*	-
21-30	101	37(36.6)	64(63.4)	1.1[0.5-2.6]	0.768
31-40	78	26(33.3)	52(66.7)	1.2[0.5-2.6]	0.659
41-49	49	15(30.6)	34(69.4)	0.8[0.3-2.3]	0.738
Marital Status					0.705[a]
Single	66	18(27.3)	48(72.7)	0.6[0.3-1.6]	0.321
Married	130	49(37.7)	81(62.3)	Ref	-
Separated	45	13(28.9)	32(71.1)	0.5[0.2-1.2]	0.124
Divorced	54	18(33.3)	36(66.7)	0.6[0.2-1.2]	0.243
Widowed	72	20(27.8)	52(72.2)	0.1[0.3-1.3]	0.207
Education Level					0.038[a]
No education	75	26(34.7)	49(65.3)	1.4[1.1-2.6]	**0.009**
Primary	117	32(27.4)	85(72.6)	Ref	-
Secondary	127	35(27.6)	92(72.4)	1.1[0.6-1.7]	0.282
College	48	25(52.1)	23(47.9)	2.9[1.4-5.8]	**0.029**
Occupation					0.050[a]
Full time house wife	32	9(28.1)	23(71.9)	0.4[0.1-1.1]	0.076
Employed/ working	38	14(36.8)	24(63.2)	0.4[0.1-1.0]	0.055
Student	44	12(27.3)	32(72.7)	3.1[1.1-4.8]	**0.023**
Farming	82	33(40.2)	49(59.8)	Ref	-
Mining	66	19(28.8)	47(71.2)	0.6[0.2-1.4]	0.210
Fishing	52	21(40.4)	31(59.6)	1.0[0.4-2.4]	0.926
Others	42	9(21.4)	33(78.6)	0.4[0.1-1.1]	0.073
Monthly Income					0.562[a]
≤5000	53	15(28.3)	38(71.7)	Ref	-
5001 - 10000	45	31(68.9)	31(68.1)	0.9[0.3-2.6]	0.907
10001 - 20000	70	31(44.3)	39(55.7)	2.1[0.8-5.6]	0.126
20001 - 30000	63	18(28.6)	45(71.4)	0.7[0.2-1.8]	0.415
30001 - 40000	59	11(18.6)	48(81.4)	0.6[0.2-1.8]	0.359
40001+	62	24(38.7)	38(61.3)	0.9[0.3-2.5]	0.806

#Logistic regression was used to assess associations. [a]Chi-square analyses were used to compare proportions. *Ref: reference category assume odds ratio of 1.0. Proportions in other categories are compared to this reference category.

Table 3: Anassociation between health workers attitude and uptake of skilled delivery services

	Overall (N=367)	Utilized skilled birth delivery	Unskilled delivery	Odds Ratio (95% CI)	*p*-value
Overall	n (%)	n (%)	n(%)		
Health Worker Attitude					-
Very friendly	74(21.7)	30(40.5)	44(59.5)	Ref*	-
Friendly	86(25.2)	39(45.3)	47(54.7)	0.8[0.4-1.5]	0.541
Unfriendly	56(16.4)	15(26.8)	41(73.2)	1.9[0.9-4.0]	0.105
Very Unfriendly	64(18.8)	22(34.4)	42(65.6)	1.3[0.7-2.6]	0.456
No firm opinion	61(17.9)	12(19.7)	49(80.3)	2.8[1.3-6.1]	**0.010**

*Logistic regression was used to assess associations. Chi-square analyses were used to compare proportions.

Table 4: Distribution of Health Facility Quality Scores

Number of Facilities (n=20)	*Scores (n=22)	Quality
1	4	Poor
1	8	Poor
3	9	Poor
1	10	Poor
1	11	Poor
5	14	Poor
2	15	Good
2	16	Good
2	17	Good
2	18	Good

*Mean =13.1 and median 14.0; Good quality were based on scores above median.

Table 5: Indicators for Quality of Skilled Delivery Service

N=20	N	%
Residence of health care givers		
Market	5	25
Facility	11	55
Home	4	20
Distance to facility from place skilled attendant lives		
<500m	13	68.42
500-1km	1	5.26
1km-1.5km	1	5.26
>1.5km	4	21.05
Trainings undergone by health care givers		
EmOC	3	15.0
CEmOC	1	5.0
PAC	7	35.0
MVA	9	45.0
Availability of basic equipment**		
Thermometer	20	100.0
BP machine	19	95.0
Fetoscope	20	100.0
Baby scale	18	90.0
MVA set	7	35.0
Virginal Exam Pack	13	65.0
Delivery pack	17	85.0
Suture pack	13	65.0
Drip stand	16	80.0
Suction machine	10	50.0
Autoclave	13	65.0
Sharp disposal	18	90.0
Baby blanket	1	5.0
Delivery bed	13	65.0
Resuscitation kit	7	35.0
Screen	14	70
Room heater	0	0
Clean linen	9	45.0
Any month's supplies missed		
Yes	**10**	50
No	**10**	50
Night maternal service		
Yes	13	65.0
No	7	35.0

**Descriptive statistics used to describe data for key indicators of quality. A 100% availability of equipment was a key determinant of quality of services at the 20 health facilities. EmOC=3; CEmOC=1; PAC=7; MVA=9.

Discussion

The study indicated that, amongst those who were aware of the nearest health facility for SBA, 32% utilized SBA as compared to 30.6% who utilized but were not aware. This is contrary to a previous reports[1] in which it was demonstrated that skilled attendants assist in more than 99% of births in developed countries relative to 62% in developing countries. It also contradicts with the goals previously set[2], of having 80% of all births assisted by skilled attendants by 2005, 85% by 2010 and 90% by 2015 globally.

The results indicated that only 37.9% of the participants knew the importance while majority (62.1%) thought health facility delivery was not important hence delivered without skilled attendant. This is similar to statistics reported by the WHO 2015 that, globally, it is estimated that 34% of mothers deliver with no skilled attendant, implying that 45 million births occur at home without skilled health personnel annually. In contrast to the principles of WHO's Safe Motherhood Initiative, hospital deliveries only account for a minority of births in many regions of SSA. As a consequence, maternal mortality rates (MMR) are among the highest in SSA, comparing unfavorably with other regions that have relatively constrained resources, such as South-East Asia and South America[3].

This study established that education level of the women had an influence on utilization of SBA. The higher the education level of the woman, the more likely she would utilize skilled birth attendance. This observation is similar to that of a previous study[4] which demonstrated that factors associated with unskilled deliveries include the education level and wealth of the mother, with 84% of children whose mothers had no education being born at home, relative to 30% of those whose mothers had secondary education. Collectively, our current and previous studies affirm that education level is critical in mothers' accessing SBA or not.

According to our current findings, source of income had a significant association with utlization of SBA. For example, compared to women who were students and utilized SBA, farming women were 3 times more likely to utilize SBA. This observation concur with a previous study in which factors like cultural beliefs, socio-demographic status, women's autonomy, economic conditions, physical and financial accessibility, disease pattern and health service issues were shown to be important determinants of the use of maternal health care services[8]. The findings also supports previous observations from India which pointed out that the low utilization of maternity services seems to be due to low levels of household income, high illiteracy and ignorance, and a host of traditional factors[9].

On the influence of friendly health workers attitude and behaviours on utilization of SBA, our results show that about 86% of the women utilized the SBA as compared to those who had no firm opinion (19.7%). Those who had no firm opinion on the worker's attitude and behaviours were 2.8 times less likely of utilizing SBA. In addition, about 16.4% felt the health workers were unfriendly, while 18.8% felt they were very unfriendly. Our findings are in line with those in a previous study where women felt reluctant to go for health facility-delivery because of negative attitudes of the health professionals which were largely associated with poor reception, caning, shouting, and refusing to attend to women in pain (especially when they presented to the facilities outside official working hours—0800 to 1700hrs) [12]. Our findings are also similar to a previous study[13], in which it was indicated that women have the perception that the health facility is a harsh setting for childbirth. As such, the health workers' attitude and behaviour on the mothers seem a critical factor in their access to SBA and necessary support to improve the workforce's attitude towards the mothers should be encouraged as a way of encouraging SBA.

Through the FGDs, the participants' described reasons that prevent women in the community from going to dispensary as: *"Attitude of the*

women towards health facility", "*Friendliness*", "*Easier to access*" *[many live nearby] and* "*Kindness*" [can offer gift after delivery] by TBA as opposed to the health caregivers. This concurs with a study on low use of skilled attendants' delivery services in rural Kenya[13], in which one community health worker said, *"They leave you alone during your labour pain at the health centre; the TBA stays with you and helps you to deal with the pain."* This perception as much as may be true, could be due to under-staffing situation of the health facilities[13], a condition that renders the health workers over-whelmed with the numbers of patients they have to attend to at a particular time.

The lack of doctors, nurses and midwives posses' serious problems for developing countries[14]. Out of the 20 health providers interviewed, (35%) of the health care givers in the facilities have been trained on PAC, only (15%) have received EmOC trainings, 1 (5%) have been trained on CEmOC while the rest (45%) of the providers were trained in MVA. Our result further showed that 35% of the health facilities had national reproductive health policy guidelines, including but not limited to reproductive health communication strategy implementation guide, Kenya National guideline for obstetric and prenatal care and EmOC guidelines representing 25.0%, 25.0% 15.0%, respectively. This in line with the Kenya National Guidelines for Quality Obstetric and Prenatal Care, (2004) addresses needs of service provider that if met would contribute to facilitating the provision of quality services that in turn address rights of the clients. These include offering training, infrastructure, supplies, guidelines, encouragement, respect and information[16].

Some participants' described some of the reasons that can prevent women in the community from going to dispensary as: *"Attitude of the women towards health facility", "Distance to health facility", "Availability of claimed TBA's", "Closure of health facilities at night, weekend and holidays",* "*Illiteracy and ignorance", "Traditions and customs of community", "Lack of delivery beds in some facilities"* and *"Transport costs".* In terms of availability of the important equipment of quality of care, in all facilities (n=20), thermometers and fetoscopes were available, in 19 (95%) facilities, and there were BP machines in 18 (90%) facilities. Not all the facilities are equipped with the necessary machines in the backdrop of the government directive that pregnant women should not pay delivery fees at any government run health facilities[18]. In Ghana, free delivery care policy was seen as an effective approach to an important problem that substantially increased utilization of skilled care for delivery[12]. However, it may be worth noting that as much as the delivery-fee-exemption policy had increased utilization of delivery services, poor quality of care, low staff strength, poverty, transportation, long distances to health facilities, socio-cultural barriers, and the custom of using traditional birth attendant still remains and these hinder access to skilled delivery [15].

Conclusion

The prevalence of skilled birth delivery was generally low. Women with secondary education or higher were more liklely to utilize skilled birth delivery compared to those with primary education. Overall, the attitude of health workers was significantly associated with higher odds of skilled birth delivery and a higher proportion of the health facilities provided poor quality services. The increase of knowledge on the importance of skilled birth delivery and positive attitude by health care providers would increase the uptake of skilled birth delivery.

Declarations

Ethics approval and consent to participate

This study commenced after approval had been received from the Maseno University Ethical Review Committee. Permission was also obtained from Migori County Government Department of Health. Informed consent was obtained from all participants. The nature, purpose, and procedure

of the study together with the time commitment required were explained to each participant on an information sheet. Participants were made aware that they were at liberty to refuse to answer any questions or drop out of the study at any time and that it would not affect them. Participants who were not able to read were informed about the study by translating the information into the *Dholuo* language. It was ensured that the translation carried the same meaning as it appeared in English. Consent was then obtained from each participant in the study where they appended their signatures or thumbprints.

In addition, all participants were assured that their responses would be treated with utmost confidentiality. The researcher analyzed the data as it was collected from the respondents without manipulations. The adolescents gave informed assent with guardians' and parental notification. Minor's confidentiality was thereafter protected as it was implicit in maintaining the participants' privacy.

The study was conducted in the participants' own environment. There was no threat of potential risk since neither drugs nor chemicals were administered. Participants would benefit from the study since interventions on improvement of skilled delivery services was to be put in place.

Conflicts of interest

The authors declare that they have no competing interests.

Authors' contributions

GO, HA, CO, SG, VW conceived, designed and drafted manuscript. Additionally, GO and VW analysed the data. All authors read and approved the final manuscript.

Disclaimer

The findings and conclusions presented in this manuscript are those of the authors and do not necessarily reflect the official position of Maseno University or Kenya Medical Research Institute. The corresponding author had full access to the study data and had final responsibility for the decision to submit for publication.

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References

1. WHO: World Health Statistics. *Publications of the World Health Organization* 2015:17-18.
2. UN: Human Rights and the Millennium Development Goals in Practice: A review of country strategies and reporting. *United nations publications* 2010, 1(1):12-42.
3. Hogan MC, Foreman KJ, Naghavi M, Ahn SY, Wang M, Makela SM, Lopez AD, Lozano R, Murray CJ: Maternal mortality for 181 countries, 1980-2008: a systematic analysis of progress towards Millennium Development Goal 5.*Lancet* 2010.
4. KDHS: Estimates of Maternal Mortality. *Kenya Demograhic and Health Survey* 2014:127,129,329.
5. Mushi DL, Mpembeni RM, Jahn A: Knowledge about safe motherhood and HIV/AIDS among school pupils in a rural area in Tanzania. *BMC Pregnancy Childbirth* 2007, 7:5.
6. Mat L, Duan-Rung C, Song-Lih H: Social and Cultural Factors Affecting Maternal Health in Rural Gambia: An Exploratory Qualitative Study. *Public Library of Sciences* 2016, 1(2):1-16.
7. Tsegay Y: Determinants of Antenatal Care, Institutional Delivery and Skilled Birth Attendant Utilization in Samre Saharti District, Tigray, Ethiopia. *Ministry of Health Ethiopia publications* 2010, 1(3):12.
8. Abou Zahr C: Global burden of maternal death and disability. *Oxford Journal of Public Health* 2003, 1(1):24-84.

9. Shariff A, Singh G: Determinants of Maternal Health Care Utilisation in India:. *National Council of Applied Economic Research-India* 2002, 2(1):4-11.
10. Babar TS, Hatcher J: Health seeking behaviour and health service utilization in Pakistan: challenging the policy makers. *Oxford Journal of Public Health* 2004, 1(2):6-56.
11. Mekonnen Y, Mekonnen A: Factors Influencing the Use of Maternal Healthcare Services in Ethiopia. *Journal of Health, Population, and Nutrition* 2003 (25-Dec-2003):9.
12. Enchill CE: Factors Influencing Skilled Delivery in the Asante Akim North Municipality of Ghana. *Kwamen Nkuruma University publications* 2010, 1(1):36.
13. Kristen A, Mark H, Marleen T: Low Use of Skilled Attendants' Delivery Services in Rural Kenya. *Journal of Health, Population, and Nutrition* 2006, 4(3):12-26.
14. UNFPA: delivering into good hands. *United nations publications* 2004, 6(1):4-21.
15. Witter S, Adjei S, Armar-Klemesu M, Graham W: Providing free maternal health care: ten lessons from an evaluation of the national delivery exemption policy in Ghana. *Glob Health Action* 2009, 2.
16. MOH: Kenya National Guidelines for Quality Obstetrics and Perinatal Care. *Ministry of Health Kenya publications* 2004, 1(3):34-56.
17. DHIS N: Maternal health. *Health information and records;Nyatike* 2012.
18. Wanjira C, Mwangi M, Mathenge E, Mbugua G, Ng'ang'a Z: Delivery practices and associated factors among mothers seeking child welfare services in selected health facilities in Nyandarua South District, Kenya. *BioMedical Center* 2011, 11:36-56.

List of Abbreviations

BP—Blood pressure
SSA—Sub-Saharan Africa
EmOC—Emergency Obstetric Care
CHW—community health workersand key informants (KIs)
CEmOC—Comprehensive Emergency Obstetric Care
FGDs—Focus Group Discussions
HCW—Health Care Workers
KII—Key Informant Interviews
MMR—maternal mortality rates
MVA—Manual Vacuum Aspiration
SBA—Skilled Birth Attendance
TBA—TraditionalBirth Attendants
PAC—Prentice Ambulatory Care
WHO—World Health Organization