

## Research Article

# Skilled Birth Attendance among Women in Tharaka-Nithi County, Kenya

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*Background.* The burden of maternal mortality is concentrated in sub-Saharan Africa with an estimation of 500 000 deaths annually. In 2012, about forty million births occurred without a skilled attendant in developing countries. Skilled birth attendance improves maternal and newborn survival. The aim of this study therefore was to establish the level of skilled birth attendance and the associated factors. *Methods.* A cross-sectional survey was carried out using structured questionnaires as tools of data collection. Systematic sampling was used to select the respondents from the facilities that were stratified. The dependent variable was skilled birth attendance. Descriptive statistics were used to generate proportions and percentages while chi-square and Fisher's exact tests were used to draw inferences. Association was significant if  $P < 0.05$ . *Results.* The level of utilisation of skilled birth attendance was 77%. Skilled birth attendance was noted to be associated with age, level of education, average family income, parity, distance to the health facility, timing of initiation of antenatal care, level of facility attended during pregnancy, and birth preparedness status. *Conclusion.* The level of skilled birth attendance among women in Tharaka-Nithi County, Kenya, despite being higher than in some counties, requires improvement.

## 1. Introduction

Maternal mortality in Kenya is 362 per 100 000 live births. This is high according to the World Health Organisation that rates figures above 300 deaths per 100 000 live births as high. Skilled birth attendance (SBA) is one of the proven interventions that can reduce maternal mortality [1]. A skilled attendant is an accredited health professional such as a midwife, doctor, or nurse who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth, and the immediate postnatal period and in the identification and management/referral of complications in women and newborns [2]. Countries like Malaysia, Sri Lanka, Thailand, and Egypt reduced at times by half the maternal mortality ratio within ten years by increasing the level of skilled birth attendance. This illustrates the impact of skilled birth attendance [3].

Maternal health is part of the social pillar in Kenya Vision 2030. It is planned that, for Kenya to achieve the vision of middle income economy by 2030, all efforts should be made to reduce maternal mortality. Skilled birth attendance

(SBA) is one of the key strategies that were adopted. It has been identified by the Kenyan government as one of the high impact interventions to reduce maternal deaths. Several initiatives including training and recruitment are underway to increase the number of skilled birth attendants. This is being coupled by improvement of infrastructure in the health facilities [1]. Tharaka-Nithi is one of the 47 counties in Kenya. According to the Kenya Health and Demographic Survey 2014/15, it is one of the middle performers in uptake of skilled birth attendance at 77%. Kiambu County is the highest at 93% while Wajir County is the lowest at 18% [4]. The main aim of this study was to establish the level and the associated factors of skilled birth attendance among women in Tharaka-Nithi County, Kenya.

## 2. Methods

*2.1. Study Design and Target Population.* This was a cross-sectional study targeting women who had delivered within a year during the study period.

**2.2. Setting.** The study was done in Tharaka-Nithi County, Kenya. It has four subcounties: Maara, Chuka/Igamba-ng'o'mbe, Tharaka North, and Tharaka South. The county falls in the former eastern province. The county has a total population of 365,330 and a surface area of 2639 km<sup>2</sup>. It has only sixty-one kilometres of bitumen (tarmac) road [5]. Tharaka South subcounty was the site of study and has only 7 km of tarmac road. The study was done among women within a catchment area of Nkondi, Lukenya, and Kamwathu dispensaries, Kibung'a, Tunyai, and Chiakariga health centres, Marimanti Level Four Hospital, and St. Orsola Matiri hospitals.

**2.3. Variables.** The independent variables were age, level of education, distance to the health facility, type of facility attended for antenatal care (level 2: dispensary; level 3: health centre; level 4: hospitals), family income, gravida, parity, uptake of focused antenatal care, timing of booking of antenatal care, and status of birth preparedness. The dependent variable was skilled birth attendance for the previous pregnancy. It is defined for the use in this study as a delivery that occurs in the health facility with necessary equipment and is attended by an approved health worker according to the World Health Organisation (WHO). It was dichotomised as "skilled birth attendance" and "nonskilled birth attendance."

**2.4. Sampling, Data Collection, and Data Analysis.** Stratified sampling was used to select the health facilities on the basis of ensuring that all the levels of the facilities were represented. The strata included the dispensaries, health centres, and hospitals. They all offer maternal and child health services. Systematic sampling was used to select the respondents. The sample size was 345 respondents determined using Kothari's (2004) formula. Semistructured questionnaires were the instruments for data collection. A pilot study was done at Nkarini mobile clinic to assess the reliability of the tools. Test-retest method was used to achieve validity. Administration was done by trained research assistants under the supervision of the principal investigator. Data was entered in Stata version 11 for analysis. Descriptive statistics, mainly percentages, were initially used after which inferences statistics were applied. Chi-square and Fisher's exact tests were the two statistical tests that were used to draw inferences (associations between the dependent and independent variables).

**2.5. Ethical and Logistical Considerations.** Ethical approval was sought from Kenyatta University Ethics and Review Committee. A research permit was obtained from the National Commission for Science Technology (NACOSTI-Kenya) and Innovation. Permission was granted by the heads of health facilities and informed consent was obtained from the respondents. Confidentiality was assured and maintained in the entire data collection period.

### 3. Results

**3.1. Skilled Birth Attendance.** The objective of this analysis was to establish the proportion of respondents whose deliveries occurred under skilled birth attendance. Skilled birth

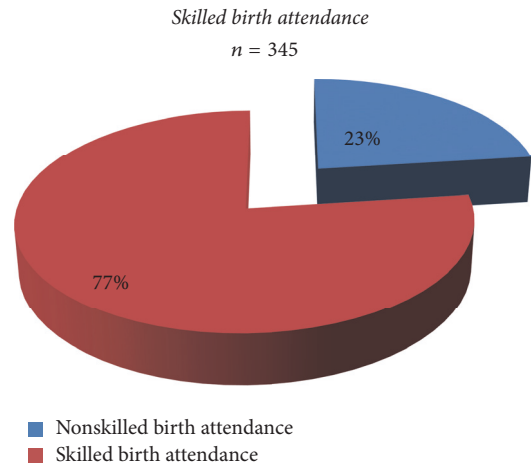


FIGURE 1: Skilled birth attendance.

attendance was deemed to have occurred if the delivery was attended in a health facility with requisite equipment and an approved health worker as prescribed by the World Health Organisation (WHO). Majority (77%) of the three hundred and forty-five women had skilled birth attendance in their most recent delivery. A birth was deemed recent if it occurred within one year of the study. Because of recall bias, births that occurred beyond a year were excluded. A small proportion (23%) delivered either at home, on the way to a health facility, or in a health facility without a skilled birth attendant. Figure 1 shows the proportion of women who had skilled birth attendance.

**3.2. Demographic and Institutional Factors Associated with Skilled Birth Attendance.** The analysis in this section was to establish the association between demographic/institutional factors that are associated with skilled birth attendance (SBA). Age in years, level of education, family income, and facility attended during antenatal care were found to be associated with SBA. The proportion of women delivering under SBA was the highest among women aged 20–24 years (90%) followed by those aged 25–29 years (80%). It was the lowest among women aged 40–44 years (50%). The proportion of women delivering under SBA increased with the increase in the level of education. This comparative increase was also noted with the increase in the level of income. There was a significant association between the distance to the health facility and skilled birth attendance ( $P < 0.001$ ). Women who attended their antenatal care in a hospital had a higher proportion of delivering under SBA compared to those who used dispensaries for their pregnancy care. Table 1 shows the demographic and institutional factors associated with skilled birth attendance.

**3.3. Pregnancy Related Factors Associated with Skilled Birth Attendance.** The analysis in this section was done to establish the association between pregnancy related factors that are associated with SBA. The increase in the number of pregnancies (gravida) and deliveries (parity) decreases the proportion of women delivering under SBA. Attendance of

TABLE 1: Demographic and institutional factors associated with skilled birth attendance.

Variable	Group	Nonskilled birth attendance	Skilled birth attendance	Statistical values
Age in years (N = 345)	Below 20	9 (28%)	23 (72%)	$\chi^2(5) = 31.32$ $P \leq 0.001$
	20–24	10 (10%)	94 (90%)	
	25–29	16 (20%)	65 (80%)	
	30–34	13 (23%)	44 (77%)	
	35–39	20 (43%)	27 (57%)	
	40–44	12 (50%)	12 (50%)	
Level of education (N = 345)	No formal education	11 (58%)	8 (42%)	$\chi^2(2) = 17.05$ $P \leq 0.001$
	Primary education	60 (23%)	196 (77%)	
	Secondary education and above	9 (13%)	61 (87%)	
Family monthly income (Kshs) (N = 345)	Below 1000	44 (32%)	93 (68%)	$\chi^2(2) = 13.76$ $P \leq 0.001$
	1000–5000	32 (20%)	124 (79%)	
	Above 5000	4 (8%)	48 (92%)	
Distance to health facility (N = 345)	More than 5 km	54 (18%)	238 (82%)	$\chi^2(1) = 23.53$ $P \leq 0.001$
	Within 5 km	26 (49%)	27 (51%)	
Facility attended during ANC (N = 327)	Dispensary	15 (21%)	56 (79%)	$\chi^2(2) = 11.66$ $P = 0.003$
	Health centre	26 (31%)	59 (69%)	
	Hospital	22 (13%)	149 (87%)	

TABLE 2: Pregnancy related factors associated with skilled birth attendance.

Variable	Group	Nonskilled birth attendance	Skilled birth attendance	Statistical values
Gravida (n = 345)	1-2	32 (17%)	159 (83%)	$\chi^2(2) = 31.72$ $P \leq 0.001$
	3-4	15 (17%)	72 (83%)	
	5+	33 (49%)	34 (51%)	
Parity (n = 345)	1-2	33 (17%)	163 (83%)	$\chi^2(2) = 27.19$ $P \leq 0.001$
	3-4	17 (20%)	70 (80%)	
	5+	30 (48%)	32 (52%)	
Attendance of focused antenatal care (n = 345)	No	56 (34%)	110 (66%)	$\chi^2(1) = 19.98$ $P \leq 0.001$
	Yes	24 (13%)	155 (87%)	
Trimester of ANC booking (n = 327)	3rd	26 (36%)	47 (64%)	$\chi^2(2) = 16.17$ $P \leq 0.001$
	2nd	31 (14%)	184 (86%)	
	1st	6 (15%)	33 (85%)	
Birth preparedness (n = 345)	Unprepared	73 (27%)	202 (73%)	$\chi^2(2) = 8.58$ $P = 0.003$
	Prepared	7 (10%)	63 (90%)	

four or more antenatal visits in a targeted manner (focused antenatal care) resulted in a higher proportion of women delivering under SBA (87%). Booking of antenatal clinics in the first and second trimester resulted in a higher proportion of women delivering under SBA compared to booking in the third trimester. Birth preparedness encompassed planning for place of delivery, means of transport, skilled birth attendance, funds for the process, and caretaker of the family during the delivery time. Birth preparedness was associated with SBA (90%) compared to nonpreparedness. Table 2 shows the pregnancy related factors associated with skilled birth attendance.

#### 4. Discussion

The main aim of the study was to establish the uptake of skilled birth attendance and the factors associated with it. The proportion of skilled birth attendance was average among the study respondents. The uptake of skilled birth attendance at Tharaka South subcounty is similar to that in Tharaka-Nithi County at 77%. This means that more than 20% still deliver at home despite the risks to the mother and to the baby. The level of skilled birth attendance was higher than the national proportion that is at 62% [1]. It is still higher than the national proportion of rural women that is at 50%. The national figure

is lowered by marginalised and hardship counties like Wajir (18%) and Tana River (32%) but also boosted by counties like Mombasa at 82% and Kiambu at 93% [4]. This finding is also higher than that found in Makueni County, Kenya [6], which was found to be at 44%. In a follow-up study in 2012 in Makueni County, it was found to be at 37% [7]. The difference may be explained by the difference in approaches of study. A study in West Pokot, Kenya, found the uptake to be much lower at 33%. West Pokot County has fewer health facilities and long distances to cover to access care which may explain the lower levels of uptake. The general socioeconomic status is low in the county coupled by poor transport/communication infrastructure. Women in these environments opt for home deliveries because of the logistical and economic limitations [8].

Skilled birth attendance is associated with age, level of education, type of employment, average family income, level of facility attended during antenatal care (dispensary, health centre, or hospital), timing of initiation of antenatal care, distance to the health facility, birth preparedness status, and parity.

An increase in age is also associated with an increase in parity. Women with advanced age may have had negative experiences in their previous hospital visits for delivery and thereby chose home deliveries. In studies in Ghana, it was found that women aged 15–19 years were more likely to deliver under skilled birth attendance compared to those aged 40–45 years [9]. Education influences decision-making. It also improves the ability to assess risks of home deliveries. Educated women are also able to synthesise the information given in health facilities or accessed in media platforms. This concurs with the findings of the Ministry of health, Kenya, where only a quarter of women without education were attended by skilled birth attendants during birth while more than 85% delivered under SBA [1]. Education has been noted in previous studies as a positive predictor of birth preparedness [10], health facility delivery [11], and focused antenatal care [12]. In South Ethiopia, education was noted to influence both skilled birth attendance and birth preparedness. Women with a higher level of education were noted to more likely prepare for birth and deliver under SBA [13].

Average family income is linked to economic status. The economic status is associated with skilled birth attendance. Birth is accompanied with costs (hospital charges, transport fees, and supplies for the baby). The ability to meet these costs influences the decision on skilled birth attendance. This agrees with findings in West Pokot County, Kenya [8]. Women in Ghana in a higher wealth index had greater autonomy in decision-making on reproductive health and more likely delivered under skilled birth attendance [9].

Distance to the health facility has implications on cost and time spent to the health facility. It by extension influences the decision to deliver in a health facility or not. Some women at times deliver on the way to the health facility due to long distances. A study in West Pokot, Kenya, found concurring results [8]. An analysis of Kenya Demographic and Health Survey 2008–2009 indicated that physical access to health facilities through distance and/or lack of transport

and economic considerations are important barriers to SBA. Access to appropriate transport for mothers in labour and improving the experiences and outcomes for mothers using health facilities at childbirth augmented by health education may increase the uptake of health facility delivery in Kenya [14]. In a related study in Makueni County, Kenya, the type of transport used to the place of delivery was associated with the place of delivery. Access to a vehicle for transport at the onset of labour was associated with a 24-fold increase in utilisation of a healthcare facility for delivery compared to other modes of transportation. The two logistical barriers to skilled birth attendance were availability and cost of transportation. For women to deliver in the presence of a skilled birth attendant, they may need support with transport and cost of services [15].

Parity (number of births) and the number of pregnancies were found to be associated with skilled birth attendance. This may be associated with previous experiences. Women who have had negative experiences and outcomes following health facility deliveries at times choose to deliver at home. There is also a category of women who have had no complications following home deliveries. This group may perceive home deliveries to be safer, though it may just be by chance. Delivery is associated with unseen complications that may not be managed at home when they set in. An occurrence, for example, of disseminated intravascular coagulation is a big risk to life that traditional birth attendants or other assistants at home may not manage because of requisite skills and facilities. This may lead to maternal death. This is consistent with other studies that have found that an increase in pregnancies and births decreases the chances of health facility deliveries [13]. Maternal mortality has been found to be higher among women with high parity [16].

Focused antenatal care, which is the attendance of at least targeted visits, was found to be associated with skilled birth attendance. The targeted visits increase the contact time of the women and the health workers for effective counselling and prompt intervention of any complications. Targeted visits place emphasis on skilled birth attendance especially during booking and the fourth visit. This is consistent with findings in a study in Ethiopia [13]. This finding also concurs with multicountry analysis on the association of antenatal care and skilled birth attendance. It was found especially in Kenya and Tanzania that the amount and quality of antenatal care have an influence on the uptake of skilled birth attendance. Quality of care and uptake of at least four antenatal visits have a positive effect on SBA [16].

Booking antenatal care early (first trimester) was noted in this study to be associated with skilled birth attendance. Early booking gives provision for more time to achieve a variety of objectives of antenatal care. This includes counselling on birth preparedness and significance of skilled birth attendance. Uptake of focused antenatal care is also feasible because of the time remaining before birth.

Birth preparedness was also noted to be associated with skilled birth attendance. The various aspects of birth preparedness could be associated with skilled birth attendance. For instance, saving money for delivery expenses and arranging for transport are expected to enable one to

reach the health facility. Identifying a skilled birth attendant early enough can also ensure that one is attended by one during delivery. Birth preparedness is one of the community strategies to reduce the two delays in accessing healthcare. When a woman is prepared for birth, she is likely to make swift decisions in seeking and reaching care. The finding in this study relates to those published on determinants of health facility delivery in Eastern Kenya where birth preparedness was found to be one of the key predictors [11]. A study in South Ethiopia on the association of birth preparedness and skilled birth attendance indicated similar findings where the probability of skilled birth attendance was increased by birth preparedness [13]. Birth preparedness uses a participatory approach where the health worker discusses with the women early enough their birth plans. It also involves the family and the community especially in the resource mobilisation part. Some resources are communal like means of transport. This involvement could be part of what results in better outcomes contrary to approaches that were unidirectional.

## 5. Conclusion

This study has shown that the level of skilled birth attendance is high (77%). Skilled birth attendance is associated with age, level of education, average family income, parity, distance to the health facility, timing of initiation of antenatal care, level of facility attended during pregnancy, and birth preparedness status.

## Additional Points

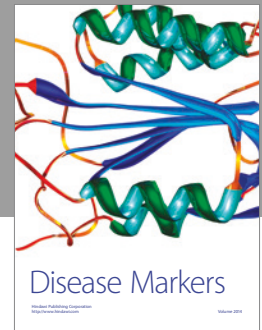
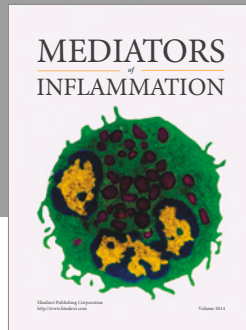
The national and county governments in collaboration with health stakeholders should initiate measures to sensitise and increase the uptake of skilled birth attendance among rural women.

## Conflicts of Interest

The researcher declares no conflicts of interest regarding the publication of this paper.

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