

Original Research Article

Factors associated with home delivery and outcomes: a case study of homesteads in Kapoeta North County, South Sudan

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ABSTRACT

Background: Delivering infants in homesteads is still considered the norm in many parts of the world. However, the practice is fraught with health risks for both pregnant women and newborns. Kapoeta North County in the eastern part of South Sudan is known to have high levels of maternal and infant deaths with an estimated 97.8% of women delivering outside health facilities. This study investigated demographic, socio-economic, and health system factors associated with home deliveries in Kapoeta North County, South Sudan.

Methods: A cross-sectional analytical research design was used. A sample of 400 women of reproductive age who had delivered in the past six months were interviewed. Cluster, stratified and simple random sampling were used to identify the study areas and to select study respondents. Quantitative and qualitative techniques of data collection were employed.

Results: Homestead delivery was found to be high, 272 (68%) women of reproductive age delivered at home. Being educated (OR=9.93, 95% CI: 2.56-38.47), distance to the health facility (OR=10.87, 95% CI: 0.04-0.20), gender of the birth attendant (OR=2.61, 95% CI: 1.25-5.45) and availability of the amenities (OR=1.83, 95% CI: 0.86-3.90) were significantly associated with home delivery.

Conclusions: The study concluded that homestead delivery at Kapoeta North County of South Sudan is high at 68%. There is a need for expansion of the health infrastructure, financial empowerment of the vulnerable women, and improved awareness through social media about the consequences of delivering at home.

Keywords: Factors associated with home delivery, Home delivery, Home outcomes, Women of reproductive age, Health care facilities

INTRODUCTION

Globally, 47% of maternal mortalities are estimated to occur in Africa, Sub-Saharan Africa contributing the largest portion.¹ Over 60% of the deliveries in these countries take place at home with unskilled birth attendants.¹ In most Sub-Saharan African countries, reducing maternal mortality has remained a persistent challenge despite improvements in the past 2 decades.² The majority of pregnancy and childbirth-associated deaths and disabilities especially in developing countries are contributed by pregnancy and childbirth-

related complications which are preventable.³ Mortality reductions for both mothers and newborns are influenced by deliveries in health facilities.⁴ As recommended by WHO access to skilled delivery care including emergency and basic obstetric services are key steps to reducing maternal and newborn deaths.²

According to recent statistics, a high maternal mortality ratio of 789 per 100,000 live births was reported in South Sudan contributing to the high mortality cases reported in the world.⁵ In a household survey carried out in South Sudan, only 11% of the deliveries took place in health facilities with about 19.4% being attended to by a

skilled health professional.⁶ A current large experimental research conducted in South Sudan focused on the dynamics of health institutions' usage for deliveries and post-natal care services in conflict arrested backgrounds to improve maternal and neonatal care.⁷ In addition, 50% of the population in South Sudan commute for hours to access public health institutions.⁷ Nonetheless, divergencies in outcomes of women's delivery at home and factors associated with home deliveries are not well documented. Thus, this study explored demographic factors, socio-economic and cultural factors, and health system factors associated with home deliveries among women of reproductive age in Kapoeta North County, South Sudan. Moreover, outcomes of women delivering at home were established.

METHODS

Study design

The study was analytical with a cross-sectional study design which generated in-depth information based on quantitative and qualitative techniques of data collection. To cross-validate the findings, concurrent triangulation was done from mixed-method data employed. Participants were presented with informed written consent after being explained the purpose of the study. The participants were given options to freely choose to participate, refuse or leave during the interview process. Participants' consent for women under 18 years was sought from their guardians (husband or parents) and was recorded in the form of the guardian signed on behalf of the participant.

Study location

The study was conducted in Kapoeta North County in South Sudan because of the high percentage of deliveries occurring at homes.⁶ The total population of reproductive age was calculated to be 21,529 from which the same size of 400 women was drawn.

Sample size

The sample size was calculated using the Yamane formula which amounted to 400 respondents for quantitative research. The qualitative study was guided by the point of saturation. Yamane Formula (1967) was used to determine sample size from this population of 21,529 women of reproductive age as follows:

$$n = N \div 1 + N e^2$$

Where n is the estimated study sample, e is the desired precision at a 0.05 level of significance and N is the number of women in the reproductive age group is 21,529. Thus putting the values in above equation sample size was calculated to be of 400 respondents.

Target population

The target populations were women of reproductive age (15-49 years) in Kapoeta North County, South Sudan, whereas the study population was women of reproductive age in the six strata.

Sampling strategy

The inclusion criteria to participate in the study included: the participant had delivered infants within the past six months; was of reproductive age (for those under 18 years the guardian signed an assent form); was an inhabitant of the six strata identified for sampling. The study area was divided into six sub – Counties which were classified as strata. Stratified sampling was used to select study participants from the six strata. Proportionate sampling was used to get the sample in each cluster. Respondents in each stratum were recruited into the study using simple random sampling.

Data collection methods and procedure

A local team of research assistants who were familiar with the local language and English were identified and trained for both qualitative and quantitative data collection tools. Furthermore, in one week, they were trained on human subjects' protection. A pre-tested semi-structured was used to collect quantitative data. The tool captured tools from participants on demographic factors; socio-economic factors; outcomes of home delivery among WRA and health system factors associated with home delivery. Research assistants recorded the responses in hardcopy questionnaires.

The qualitative data were collected using a peer-reviewed focus group discussion (FGD) guide and key informant interview (KII) guide to gain an in-depth understanding of demographic factors, socio-economic factors, outcomes of home delivery, and health system factors associated with home delivery. Participants who were identified during the quantitative study and confirmed their availability for qualitative research were purposively recruited for FGDs. Health care providers who were experts in this subject matter were purposively selected for KII. Qualitative data were audio-recorded in the local language and back-translated later into English. The audio-recorded data was transcribed verbatim.

Data analysis

The quantitative data collected was entered into excel for cleaning purposes. Cleaned data were imported into SPSS version 26 for analysis. Since all data was categorical, frequencies, numbers, and percentages were used to describe the data. A Chi-square test was performed to check for an association between independent variables and dependent variables.

A p-value of less than 0.05 was considered significant. All variables which were significant in bivariate analysis were fitted into the binary logistic regression model. Variables that had a p-value of less than 0.05 were concluded to be associated with home deliveries. The recorded qualitative data was transliterated into a textual format and cleaned in Microsoft word. The cleaned data was uploaded into NVIVO version 11 and analyzed thematically.

RESULTS

Prevalence of women who delivered at home in the last 6 months

As illustrated in (Figure 1), more than half (68%) of respondents reported having delivered at home with only 32% delivering at the health facility. A large proportion (66.1%) of study participants were assisted by traditional birth attendants. Some of the common reasons cited by the majority of the participants in the focus group discussion for delivering at home included distance and fear. A segment of the discussants noted: “when the mothers go for ANC, some fear abdominal palpation touching the baby inside the uterus makes them fear (FGD1, R5).

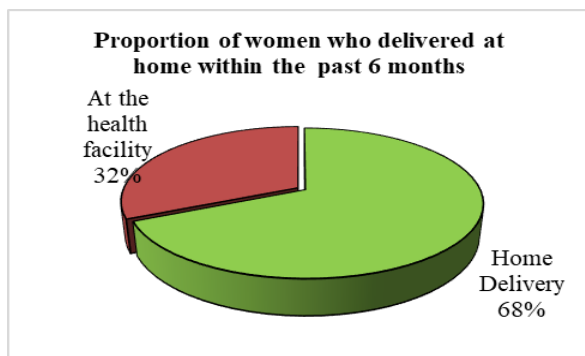


Figure 1: The proportion of women who delivered at home.

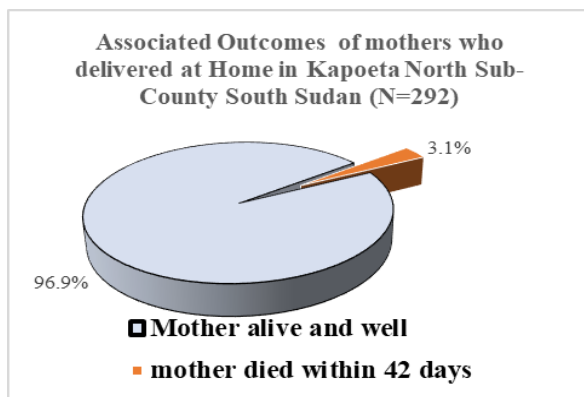


Figure 2: Deaths amongst women within 42 days of delivery.

Table 1: Socio-demographic and economic characteristics of the study participants.

Variables	Frequency	%
Age (years)		
<20	212	49.6
>20	215	50.4
Total	427	100.0
Marital status		
No	60	14.1
Yes	367	85.9
Total	427	100.0
Proportion of first wife among married women		
No	122	33.3
Yes	244	66.7
Total	366	100.0
Number of children delivered		
<2	163	38.2
>2	264	61.8
Total	427	100.0
Cost of transport to health facility		
0-2000 SSP	198	46.4
>2000 SSP	229	53.6
Total	427	100.0
Household breadwinner		
Wife	364	85.2
Husband	63	14.8
Total	427	100.0
Ever been in school		
No	382	89.5
Yes	45	10.5
Total	427	100.0

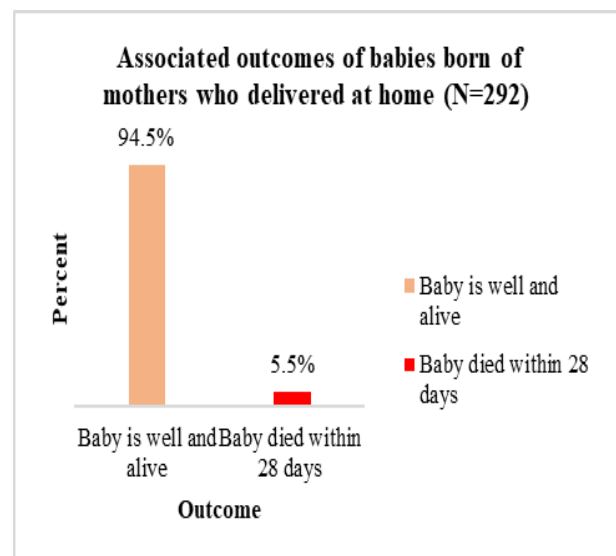


Figure 3: Outcomes of babies associated with home delivery.

Outcomes associated with delivery at home

Deaths amongst women within 42 days of delivery: as displayed in figure 2, 3% of the women who delivered at home lost their lives. Outcomes of babies associated with home delivery: as demonstrated in figure 1, 5.5% of the babies who were born at home died within 28 days of birth. Outcomes of both the mother and child associated with home delivery: as indicated in (Figure 3) home delivery led to death of 1.9% of both mothers and children as was reported by the participants. Univariate analysis of socio-demographic and socio-economic factors: as shown in (Table 1). Total 50.4% of the sampled participants were aged ≥ 20 years. More than three-quarters (85.9%) were married.

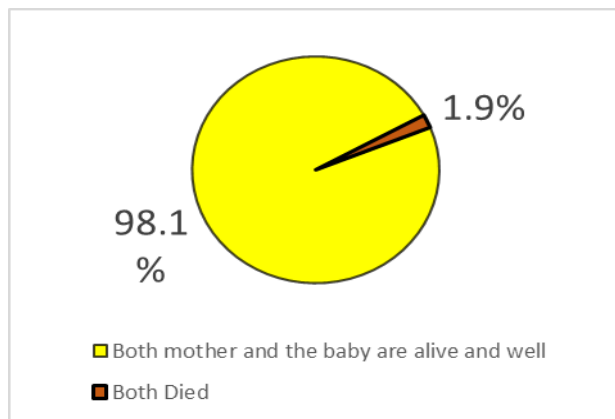


Figure 4: Outcomes of both the mother and child associated with home delivery.

Univariate analysis of health facility-related factors

As presented in (Table 3), almost all respondents (98.4%) cited that health facilities were open during the day. More than half (64.9%) of respondents resided more than five kilometers from the health facility. About 51.2% of the sampled respondents reported to have been attended to by a male health care professional, whereas close to a half (48.8%) were attended to by a female health care professional. More than half (68.9%) of respondents in Close to three-quarters of the participants (61.8%) had more than two children. Regarding the cost of transport, half of the respondents noted that the cost of transport exceeded 2000 South-Sudanese pounds. Only 10.5% reported having ever gone to school. Bivariate and multivariate analysis of socio-demographic factors: as indicated in (Table 2), when socio-demographic factors were analyzed in the Chi-square test for independence, a significant relationship was revealed between the dependent variable and the following independent variables: Age ($\chi^2=6.213$, $df=1$, $p=0.01$), has ever been to school ($\chi^2=32.32$, $df=1$, $p<0.00$), and household breadwinner ($\chi^2=19.59$, $df=1$, $p<0.00$) were statistically associated with home delivery. Besides, participants who had a formal level of education were 9.9 times more likely to

give birth in the hospital in comparison to those who had never been to school as demonstrated in binary logistic regression analysis in (Table 5). As opined by most of the respondents in KIIs, these results agreed with quantitative findings. The nursing officer-in-charge narrated that. "Illiteracy among women as they can't give accurate dates of their last menstrual period (LMP) to estimate the expected date of delivery and you find that some of the women deliver at home abruptly irrespective of their ANC attendance" (KII2, Nursing officer in charge). This survey perceived cordial treatment by health care workers. About a third (31.1%) of them claimed to have been rudely treated by health care workers at the health facility.

Bivariate and multivariate analysis of health system factors

As mentioned in (Table 4), when several health system factors were analyzed in the Chi-square test for independence, a significant association was manifested by the dependent variable and the following independent variables: distance to the health facility ($\chi^2=74.45$, $df=1$, $p=0.00$), gender of the women ($\chi^2=9.88$, $df=1$, $p=0.00$), perceived health care worker treatment ($\chi^2=7.41$, $df=1$, $p=0.01$), and perceived availability of amenities for delivery ($\chi^2=51.122$, $df=1$, $p<0.001$). In the same line with bivariate analysis, as shown in the table, the perceived availability of amenities at the health facility increased the odds of hospital delivery by WRA by 1.8. There was a prevailing notion among the FGDs respondents which was in keeping with quantitative findings on the high prevalence of home delivery because of the unavailability of amenities at the health facilities.

A discussant in FGD narrated. "Closure of facilities on holidays like Saturdays and Sundays and during night hours, so those women in labor on those days end up giving birth at home" (FGD 4, R2). Besides, long distances of more than five kilometers also decreased the odds of home delivery by 11.11 times compared to short distances of five kilometers and below which was the reference category. Consistently, these results were armored by qualitative findings as cited by a large proportion of participants that health facilities were located a long distance from their vicinity, thus increasing home delivery.

A segment of the in-depth-discussants opined that; "accessibility as many women live a far distance from the facility" (FGD 3, R5). "Insecurity in the county and distance that put women at high risks of traveling to the facility" (FGD1, R4). Lastly, individuals who were attended by a female birth attendant were 2.61 times more likely to deliver at the hospital contrary to those who were attended by male birth attendants. Congruently, a larger proportion of participants in qualitative research indicated that being attended by female health professionals increased the likelihood of

women delivering at the hospitals in comparison to male attendants. One discussant perceived that; “Some women fear to come to the facility because they are not

comfortable to be attended by male nurses because of cultural factors” (FGD3, R6).

Table 2: Bivariate analysis of socio-demographic and socio-economic factors.

Variables	Age N (%)		Chi-square test values
Place of the previous delivery	<20	>20	
At home	133 (45.5)	159 (54.5)	X ² =6.21, df=1, p=0.01
At the health facility	79 (58.5)	56 (41.5)	
Marital status	No	Yes	
At home	40 (13.7)	252 (86.3)	X ² =0.10, df=1, p=0.76
At the health facility	20 (14.8)	115 (85.2)	
Ever schooled	No	Yes	
At home	278 (95.2)	14 (4.8)	X ² =32.32, df=1, p<0.001
At the health facility	104 (77)	31 (23)	
Household breadwinner	Wife	Husband	
At home	264 (90.4)	28 (9.6)	X ² =19.59, df=1, p<0.001
At the health facility	100 (74.1)	35 (25.9)	
Estimate cost of travel to health facility	0-2000 SSP	>2000 SSP	
At home	128 (43.8)	164 (56.2)	X ² =2.39, df=1, p=0.12
At the health facility	70 (51.9)	65 (48.1)	

Table 3: Binary logistic regression model analysis

Variables	OR	P value	95% CI	
Age of respondents (years)			Lower	Upper
<20	Reference			
>20	1.62	0.21	0.76	3.45
Marital status				
No	Reference			
Yes	1.04	0.95	0.35	3.05
Ever been to school				
No	Reference			
Yes	9.93	<0.001	2.56	38.47
Distance to health facility (km)				
<5	Reference			
>5	11.11	<0.001	0.04	0.20
Gender of birth attendant				
Male	Reference			
Female	2.61	0.01	1.25	5.45
Perceived availability of amenities at the health facility				
No	Reference			
Yes	1.83	0.12	0.86	3.90
Health worker treatment at health facility				
Cordially	Reference			
Rudely	0.58	0.17	0.27	1.27
Constant	2.26	0.24	0.58	8.85

DISCUSSION

One of the goals of this study was to document the proportion of women who deliver at home in Kapoeta county. A larger percentage of women 68% were reported to give birth at home. Based on the above findings, there is an improvement from the 2010 household survey which revealed 89% of the women

delivered at home.^{6,7} The great emphasis made by the government of South Sudan to lessen pregnancy complications and maternal mortalities could account for the improvement in the number of women giving birth at home. These results were in agreement with a similar result of a research carried out in West Pokot County of Kenya. Correspondingly, research carried out in Ethiopia documented consistent reports.⁹

Nevertheless, it contradicted another study in Kilifi which showed a much lower percentage of women delivering at home.¹⁰ The huge disparities observed between the above-mentioned research and this current

study could be linked to high-level campaigns and interventions including beyond zero campaigns placed by the government of Kenya and other health stakeholders to reduce maternal mortalities.¹¹

Table 4: Bivariate analysis of health system factors

Variables	Age N (%)		Chi-square test values
Distance to health facility (km)	<5	>5	
At home	63 (21.6)	229 (78.4)	X ² =74.45, df=1, p=0.00
At the health facility	87 (64.4)	48 (35.6)	
Gender of birth attendant	Male	Female	
At home	52 (65)	28 (35)	X ² =9.88, df=1, p=0.00
At the health facility	55 (42.6)	74 (57.4)	
Perceived health care worker treatment	Cordially	Rudely	
At home	45 (57.7)	33 (42.3)	X ² =7.41, df=1, p=0.01
At the health facility	97 (75.8)	31 (24.2)	
Health facility open hours	Day	Night	
At home	45 (57.7)	33 (42.3)	X ² =0.99, df=1, p=0.32
At the health facility	97 (75.8)	31 (24.2)	
Preferred age of healthcare worker	Young	Old	
At home	55 (58.5)	39 (41.5)	X ² =3.17, df=1, p=0.09
At the health facility	91 (70)	39 (30)	
Perceived availability of amenities for delivery	No	Yes	
At home	185 (64.5)	100 (35.1)	X ² =52.12, df=1, p<0.001
At the health facility	36 (27.1)	97 (72.9)	

Table 5: Binary logistic regression model analysis

Variables	OR	P value	95% CI	
Age of respondents (years)			Lower	Upper
<20	Reference			
>20	1.62	0.21	0.76	3.45
Marital status				
No	Reference			
Yes	1.04	0.95	0.35	3.05
Ever been to school				
No	Reference			
Yes	9.93	<0.001	2.56	38.47
Distance to health facility (km)				
<5	Reference			
>5	11.11	<0.001	0.04	0.20
Gender of birth attendant				
Male	Reference			
Female	2.61	0.01	1.25	5.45
Perceived availability of amenities at the health facility				
No	Reference			
Yes	1.83	0.12	0.86	3.90
Health worker treatment at health facility				
Cordially	Reference			
Rudely	0.58	0.17	0.27	1.27

Concerning education, women who had not gone to school were more likely to give birth at home. Likewise, Kimario et al, Gebremichael et al, and Bado et al have shown that a lack of education significantly reduced the likelihood of women giving birth at health facilities.¹²⁻¹⁴ Decision-making power and economic solvency of women are influenced by the level of education which

in turn influence their preferences.¹⁵ Nevertheless, this did not hold true in a study conducted in three Asian countries which found uneducated women had higher odds of facility delivery compared to educated women.¹⁵ According to our results, distance to the health facility played a detrimental role in influencing the place of delivery; women who considered the distance to the health facility to be challenging had higher odds of giving birth at home. These results were harmonious with several prior reports in Africa.^{12,14,16,17} Due to the dual influence portrayed by distance to the health facility, it is a real hindrance to access to care and it can also be used as a reason for not seeking health services.¹⁸ However, increased accessibility to health facilities in a study carried out in Zambia, was not associated with increased odds of home delivery.¹⁹ Remarkably, women were 2.61 times more likely to seek skilled attendance at the health facility is attended by a female health care provider compared to a male

provider. Female health care providers are viewed to be easier to relate with unlikely male providers on gender preventive health services and emotional levels.²⁰ These results conformed with findings from Kenya which showed a statistically significant association between the gender of the health care provider and place of delivery.²¹

Regarding the availability of amenities, participants who reported its availability were more likely to give birth at the hospital contrary to those who reported unavailability of health amenities. Reliably, these findings concur with Sara et al who established that increased amenities upsurged the number of hospital deliveries amongst women.²²

Limitations

Limitations of current study were; temporal and causative inferences between home delivery and independent variables could not be allowed by the cross-sectional study design. Self-reporting by respondents might have caused social desirability bias.

CONCLUSION

Women may be exposed to a higher risk of infant mortality and morbidity if they deliver outside health facilities and if they are attended by unskilled health care professionals. Despite improvement in the number of women giving birth at the hospitals, the proportion of those delivering at home is still high in South Sudan. Improved availability of maternal services through the establishment of community health centers could decrease significantly the number of women giving birth at home. Improved educational sensitization targeting uneducated women should be made to increase levels of education among uneducated women.

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