Original Research Article

Predictors of birth preparedness among women in Laikipia County, Kenya

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ABSTRACT

Background: Maternal complications are the second leading cause of death among women after HIV/AIDS. World Health Organization (WHO) estimates that about 94% of all maternal deaths worldwide occur in developing countries. Evidence shows that birth preparedness; the process of strategizing for normal spontaneous vaginal delivery and anticipating the action plan in an obstetric emergency, reduces maternal mortality.
Methods: The study assessed the predictors of birth preparedness among women in Laikipia county, Kenya. It was a mixed method, cross-sectional analytical study conducted among 259 women who had delivered within one year prior to the study. Facilities were selected through simple random sampling, whereas participants were selected through systematic sampling. It was a facility-based study using structured questionnaire and key informant interview guide, and data analysed using Statistical package for the social sciences (SPSS).
Results: The level of birth preparedness was 23.2%. Inferential statistical tests showed that education, occupation and income, were statistically significant associated with the level of birth preparedness p<0.05, CI=95%). Logistic regression showed that tertiary education (AOR=8.469), formal employment (AOR=4.898) and, income above Kshs 39,000 (AOR=4.834) had a positive association with birth preparedness.
Conclusions: The level of birth preparedness was low in Laikipia County. Woman's education, occupation and household monthly income were the predictors of birth preparedness.

Keywords: Birth preparedness, Maternal mortality, Predictors, Birth plan, Danger signs, Pregnancy

INTRODUCTION

World Health Organization (WHO) estimates that about 94% of all maternal deaths worldwide occur in low- and middle-income countries. These countries are mostly in the sub-Saharan Africa and southern Asia.[1] Birth preparedness helps in preventing occurrence of the three delays associated with maternal morbidity and mortality.[2] One of the underlying causes of high maternal mortality is lack of birth preparedness.

In Kenya, despite all the efforts to improve maternal health, ranging from free maternity services to universal health coverage, maternal mortality rate is still high.[3] In 2017, maternal mortality ratio was estimated at 342 deaths per 100,000 live births. According to district health information system (DHIS2) database, in Laikipia county, the ratio increased from 71 deaths to 112 deaths per 100,000 live births. Laikipia East sub-county in particular, had a maternal mortality ratio of 138 deaths per 100,000 live births in 2019 up from 79 deaths per 100,000 live births in 2018. This is an upward trajectory contrary to the WHO target.[4] There is insufficient data relating to birth

preparedness in Laikipia.[5] The role of birth preparedness in maternal health has been overlooked.[6]

The objectives of the study were: to determine the level of birth preparedness and the socio-demographic factors influencing birth preparedness among women in Laikipia county, Kenya. Information generated from this study demonstrated the role of birth preparedness in reducing maternal morbidity and associated mortality.[7]

METHODS

Study design

The facility based mixed method cross-sectional analytical study was conducted in selected health facilities in Laikipia county namely; Nanyuki Teaching and Referral Hospital, Makutano, Sweetwaters and Baraka health centres between the months of April 2021 and May 2021.

Study population

The study included women who had given birth in Laikipia county one year prior to the study and health care providers who had worked in the child welfare clinic for at least six months. Only those who voluntarily consented were recruited. We excluded women who refused to consent and those who could not be able to participate due to a medical or mental disorder. A sample size of 260 was estimated using Cochran's formula as applied by Fisher with an estimation of 10% non-response.[8]

Sampling

Laikipia county was purposively sampled because of the increasing maternal mortality rate in the recent years. Laikipia East sub-county was purposively sampled because it had consistently recorded the highest maternal deaths compared to the other sub-counties of Laikipia county. Facilities were sampled from every ward using simple random sampling method.

The number of respondents was determined based on the monthly child welfare clinic's clients which served approximately 1,253 women per month.[9] We used an interval of 4 to systematically randomly sample the participants. Six key informant interviewees were purposively sampled based on their experience on maternal health, and sample size determined by point of data saturation.

Research instruments

A pretested structured questionnaire was used to collect quantitative data while key informant interview guide was used to collect qualitative data. To validate the research instruments, we conducted a pre-test among 26 responded drawn from Ndaragwa sub-county of Nyandarua county which has similar characteristics to the study sub county. The questionnaire contained four sections on socio-

demographic, maternal related, health system related factors and information on birth preparedness. Birth preparedness was assessed using the six basic components of birth plan as provided by WHO. The KII guide had five questions on maternal health and birth preparedness in Laikipia county.

Data collection and analysis

Data was collected by 5 research assistants. Whereas mothers were interviewed as they exited the child welfare clinic, health care providers were interviewed in their working stations. The data was then analysed using Statistical Package for Social Sciences (SPSS) version 25. Inferential statistics was used to test hypothesis whereas logistic regression model was used to assess the trend and strength of association. Thematic analysis was applied for qualitative data.

Ethical consideration

Ethical clearance was obtained from Kenyatta University ethics review committee (KUERC).

RESULTS

Socio-demographic characteristics of the respondents

Majority 109 (42.1%) were aged between 30-39 years, with the highest proportion 101 (39%) having attained secondary school education. Likewise, those who were married 201 (77.6%), protestants 160 (61.7%), housewives 99 (38.2%) and rural residers 203 (78.4%) constituted the majority. On monthly household income majority 95 (36.7%) had less than or Kshs 10,000.

Level of birth preparedness

The overall level of birth preparedness in Laikipia county was found to be very low at 23.2%. Birth preparedness was assessed using the six WHO basic components of birth preparedness namely; arrangement for health facility for delivery, finances, birth companion, birth attendant, home caretaker and transport. The least planned for was the component of a compatible and willing blood donor while finance was the most planned for component.

Bivariate associations between independent factors and birth preparedness

Highest level of education attained, occupation and monthly household income were the socio-demographic factors that had significant statistical association with birth preparedness.

Predictors of birth preparedness

Variables that had significant statistical association at 95% level of confidence, were further tested on logistic regression to show the strength and direction of

association. A woman who had attained university or college education, formal employment and a monthly household income of above Kshs 39,000 were associated with highest practise of birth preparedness than other categories.

Table 1: Socio-demographic characteristics of the respondents (n=259).

Variables	Frequency	Percentage (%)
Age (years)		
18-19	17	6.6
20-29	103	39.8
30-39	109	42.1
40-49	30	11.6
Current education level		
Primary	98	37.8
Secondary	101	39.0
College/university	49	18.9
Never attended school	11	4.2
Religion/denomination		
Catholic	85	32.8
Protestants	160	61.8
Muslim	10	3.9
Other	4	1.5
Marital status		
Single	29	11.2
Widowed	13	5.0
Separated	12	4.6
Divorced	4	1.5
Married	201	77.6
Current occupation		
Business woman	76	29.3
Formally employed	30	11.6
Housewife	99	38.2
Casual labourer	54	20.8
Place of residence		
Urban area	56	21.6
Rural area	203	78.4
Household income (Kshs)		
0-10,000	95	36.7
>10,000-19,000	57	22.0
>19,000-29,000	55	21.2
>29,000-39,000	41	15.8
Over 39,000	11	4.2

Kshs=Kenya shillings.

Table 2: Association of socio-demographic factors and birth preparedness.

Variable and category	Unprepared	Prepared	Value	df	P value
Age (years)					
18-19	14 (82.4)	3 (17.6)	Fisher-Freeman-Halton exact test=4.549		0.201
20-29	74 (71.8)	29 (28.2)			
30-39	84 (77.1)	25 (22.9)			
40-49	27 (90.0)	3 (10)			
Highest education level					
Primary	84 (85.7)	14 (14.3)	Fisher-Freeman-Halton exact test=12.056		0.005*
Secondary	75 (74.3)	26 (25.7)			
Tertiary	30 (61.2)	19 (38.8)			
No school	10 (90.9)	1 (9.1)			

Continued.

Variable and category	Unprepared	Prepared	Value	df	P value
Marital status					
Single	24 (82.8)	5 (17.2)	Fisher-Freeman-Halton exact test=3.689[a]	4	0.664
Widowed	10 (76.9)	3 (23.1)			
Separated	10 (83.3)	2 (16.7)			
Divorced	4 (100.0)	0 (0.0)			
Married	151 (75.1)	50 (24.9)			
Religion/denomination					
Catholic	59 (69.4))	26 (30.6)	Fisher-Freeman-Halton exact test=4.422		0. 194
Protestants	127 (79.4)	33 (20.6)			
Muslims	9 (90.0)	1 (10.0)			
Others	4 (100.0)	0 (0.0)			
Occupation					
Business woman	54 (71.1)	22 (28.9)	Pearson's X^2=8.146	3	0.043*
Employed	19 (63.3)	11 (36.7)			
Housewife	79 (79.8)	20 (20.2)			
Casual laborer	47 (87.0)	7 (13.0)			
Income					
<10,000	80 (84.2)	15 (15.8)	Freeman-Halton exact test=11.616		0.017*
10,000-20,000	48 (84.2)	9 (15.8)			
>20,000-30,000	37 (67.3)	18 (32.7)			
>30,000-39,000	26 (63.4)	15 (36.6)			
>39,000	8 (72.7)	3 (27.3)			
Residence					
Urban area	38 (67.9)	18 (32.1)	Pearson's X^2=3.235	1	0.065
Rural area	161 (79.3)	42 (20.7)			

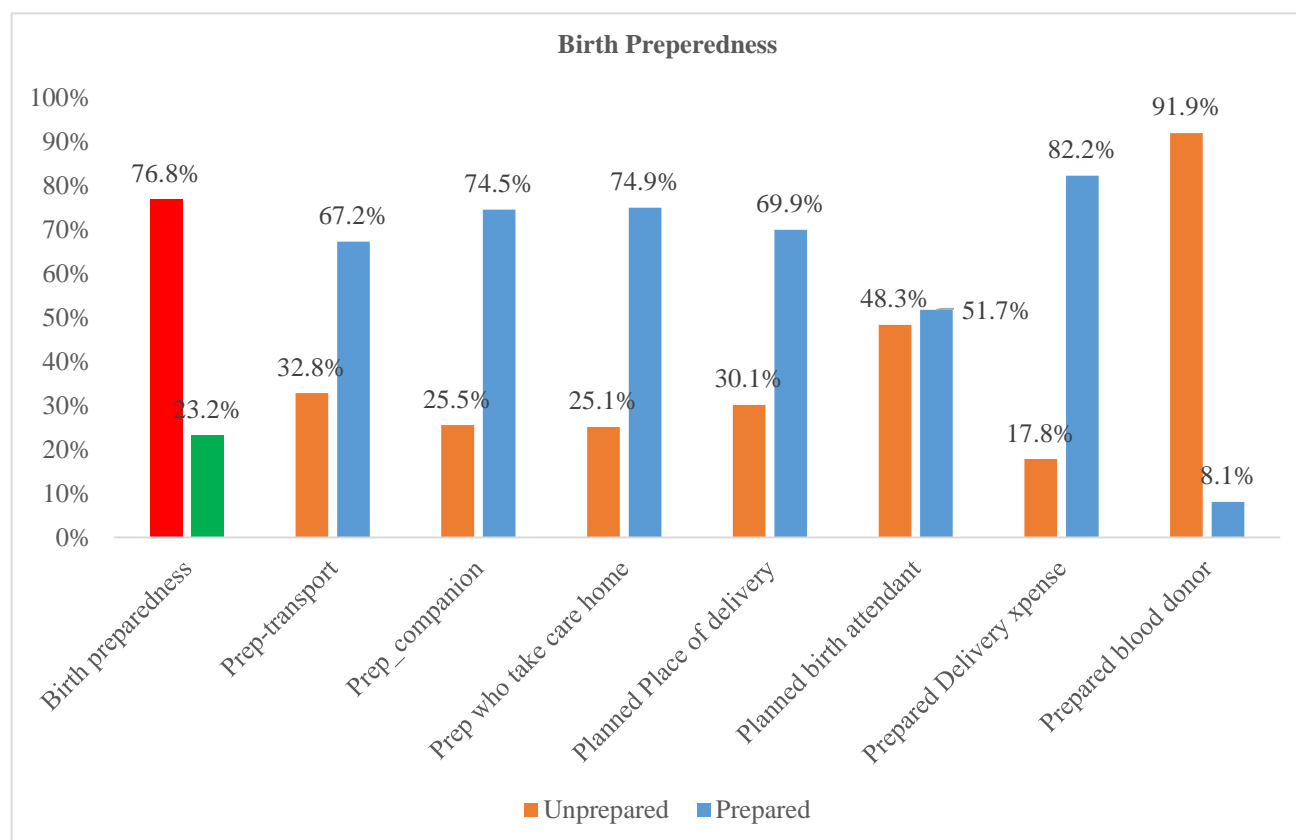Kshs=Kenya shillings, *P<0.05 is significant, X2 = Chi Square, df = degrees of freedom.

Figure 1: Level of birth preparedness.

Table 3: Predictors of birth preparedness.

Variable	B	S. E.	Wald	Df	Sig.	OR	95% C. I. for AOR	
							Lower	Upper
Education								
Never attended school (ref)			13.321	3	0.004			
Primary	0.593	1.166	0.259	1	0.611	1.809	0.184	17.764
Secondary	1.643	1.151	2.036	1	0.154	5.169	0.541	49.360
University/college	2.136	1.172	3.321	1	0.005	8.469	0.851	84.272
Occupation								
Casual laborer (Ref)			9.174	3	0.027			
Housewife	0.675	0.532	1.610	1	0.204	1.964	0.692	5.569
Business woman	1.352	0.539	6.302	1	0.012	3.865	1.345	11.106
Formally employed	1.589	0.646	6.046	1	0.014	4.898	1.380	17.383
Income (Kshs)								
<10,000 (ref)			15.339	4	0.004			
10,000-20,000	0.043	0.497	0.008	1	0.930	1.044	0.395	2.765
>20,000-30,000	1.240	0.449	7.628	1	0.006	3.456	1.433	8.331
>30,000-39,000	1.545	0.512	9.105	1	0.003	4.687	1.718	12.782
>39,000	1.576	0.819	3.701	1	0.020	4.834	0.971	24.066

Kshs=Kenya shillings, *p<0.05 is significant, CI=confidence interval, AOR=adjusted odds ratio

DISCUSSION

Level of birth preparedness

The study findings of 23.2% level of birth preparedness in Laikipia county were close to a study conducted in rural Rwanda where birth preparedness was 22.3%.[10] However, the level of birth preparedness was lower than in the rural settings of Jardega Jarte district, Western Ethiopia where the level was 27.5%.[11] A study in Ghana found the level of birth preparedness to be as low as 15%.[12] However, this study integrated birth preparedness and complications readiness, something that may have contributed to such low prevalence. In another similar study in a rural setting in Bangladesh, the level of birth preparedness was found to be lower at 12%. However, in that study preparedness was measured based on emergency obstetric preparedness including plan for emergency caesarean surgery.[13] This study results correlates with a similar study conducted in Karnataka, India, which found the level of birth preparedness to be very low.[14] Though majority agreed that birth preparedness is an important concept for enhancing complications-free delivery, they maintained that it was not realistic. However, the study disagreed with a similar study conducted in Bengal, India that found birth preparedness to be quite high at 75 percent.[15]

Socio-demographic factors of the respondents

Significant statistical association between birth preparedness and independent variables; education, income, occupation was found at 5% level of significance. These findings correlate with the finding in a study conducted in Thailand.[16] The level of education of a woman influences her perception and decision making towards birth preparedness. These findings agree with a study conducted among nomadic pastoralist women in West Pokot County. Increase in the level of education and income was associated with increased birth preparedness.[17] In Laikipia county and Kenya at large, access to information has improved due to mainstream and social media.[18] Therefore, women have good access to information including reproductive health information and consume it differently depending on one's level of education. However, a similar study conducted in Ethiopia, found age to be a predictor of birth preparedness, unlike in this study.[19]

CONCLUSION

The study found low level of practice of birth preparedness of 23.2%, among women in Laikipia county, Kenya. Financial preparation was the component of birth preparedness that was highly planned for at 82.2% while identification of a compatible willing blood donor was the least planned for at 8.1%. Socio-demographic factors found to have a significant statistical association with birth preparedness were education, occupation and household income. On logistic regression analysis, an increased in level of education of a woman was associated with increase in the odds of practicing birth preparedness. Formally employed and businesswomen were more likely to practice birth preparedness compared to housewives and casual laborers who had low odds of birth preparedness. Increase in the amount of monthly household income was associated with increased in odds of birth preparedness.

Recommendations

The national government and the county government of Laikipia should invest more on programs that can increase women's income in the county. Monthly household income was associated with practice of birth preparedness. The county government should also focus on strengthening

programs related to women education. The researcher recommends for further studies on the impact of utilization of birth preparedness concept on maternal health in Laikipia county.

REFERENCES

1. Cooper. World health statistics overview 2019: monitoring health for the SDGs, sustainable development goals. Available at: https://www.who.int/publications/i/item/world-health-statistics-2019-monitoring-health-for-the-sdgs-sustainable-development-goals. Accessed on 05 December 2021.
2. World Health Organization (WHO) Birth and emergency preparedness in antenatal care. Intergrated Manag. pregnancy childbirth. 2015. Available at: https://apps.who.int/iris/bitstream/handle/10665/250796/9789241549912-eng.pdf. Accessed on 05 December 2021.
3. UNICEF. Situation analysis of children and women in Kenya. 017. Available at: https://www.unicef.org/kenya/media/136/file/SITAN-report-2017-pdf.pdf. Accessed on 05 December 2021.
4. Kenya Demographic and Health Survey. Available at: https://dhsprogram.com/pubs/pdf/fr308/fr308.pdf. MOH, M. of H. (2017). Kenya Country Summary—Selected Demographic and Health Indicators Data. K Accessed on 05 December 2021.
5. Laikipia County Government. County Intergrated Development Plan. 2018. Available at: https://repository.kippra.or.ke/handle/123456789/932. Accessed on 05 December 2021.
6. Cheptum J, Omoni G, Mirie W. Role of Men in Birth Preparedness: A Qualitative Study of Women Attending Antenatal Clinics in Migori County, Kenya. J Midwifery Reprod Heal. 2019;7:1506-13.
7. World Health Organization. WHO recommendations on antenatal care for a positive pregnancy experience. 2016. Available at: https://www.who.int/publications-detail-redirect/9789241549912. Accessed on 05 December 2021.
8. Fisher RA. Statistical method for research workers. 1926. Available at: http://www.haghish.com/resources/materials/Statistical_Methods_for_Research_Workers.pdf. Accessed on 05 December 2021.
9. DHIS. DHIS 2 Pivot Tables. 2019. Available at: https://hiskenya.org/dhis-web-pivot/index.html. Accessed on 05 December 2021.
10. Smeele P, Kalisa R, van Elteren M, van Roosmalen J, Van den Akker T. Birth preparedness and complication readiness among pregnant women admitted in a rural hospital in Rwanda. BMC Pregnancy Childbirth. 2018;18:1-7.
11. Asrat T, Baraki N, Assefa N, Alemkere G. Birth Preparedness among Women Who Gave Birth in the Last Twelve Months in Jardega Jarte District, Western Ethiopia. J Pregnancy. 2019;6473725.
12. Saaka M, Alhassan L. Prevalence and predictors of birth preparedness and complication readiness in the Kassena-Nankana district of Ghana: An analytical cross-sectional study. BMJ Open. 2021;11:1-9.
13. Pervin J, Nu TU, Rahman AMQ, Rahman M, Uddin B, Razzaque A, Johnson S, Kuhn R, Rahman A. Level and determinants of birth preparedness and complication readiness among pregnant women: A cross sectional study in a rural area in Bangladesh. PLoS One. 2018;13:1-14.
14. Johnson AR, Ajay S. Are Pregnant Women in Rural Areas Aware of Birth Preparedness? Evidence from a Rural Maternity Hospital in South Karnataka. J Med Sci Heal. 2021;7:25-31.
15. Sau B, Ghosh S, Samanta A. Assessment of Birth Preparedness and Complication Readiness among Postnatal Mothers in Tertiary Care Hospital, West Bengal. J Clin Diagnostic Res. 2021;15:4.
16. Kiataphiwasu N, Kaewkiattikun K. Birth preparedness and complication readiness among pregnant women attending antenatal care at the faculty of medicine Vajira hospital, Thailand. Int J Womens Health. 2018;10:797-804.
17. Kasmai EK. Birth Preparedness and Complication Readiness Among Pokot Nomadic Pastoralists' Pregnant Women in East Pokot District, Midwest-Kenya. Am J Biomed Life Sci. 2018;6:17.
18. Kimani C. Socio Economic Factors Influencing Access to Reproductive Health Services Among Youth of Laikipia County, Kenya. 2018.
19. Bejitual K, Jabessa Z, Care A. Birth Preparation and Complication Readiness among Antenatal Care Attendants in Bule Hora Governmental Health Facilities in Oromia Region, Ethiopia, in 2019. 2019.