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Factors associated with quality of intrapartum care in Kenya: a complex samples analysis of the 2022 Kenya demographic and health survey

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Abstract

Background

Quality of intrapartum care remains a key intervention for increasing women's utilization of skilled birth attendants in health facilities and improving maternal and newborn health. This study aimed to investigate the factors associated with the quality of intrapartum care using the 2022 Kenya Demographic and Health Survey (KDHS).

Methods

Secondary data from the 2022 KDHS of 11,863 participants, who were selected by multistage stratified sampling, was used. Quality of intrapartum care was considered if a mother had a facility-based delivery, received skilled assistance during birth, and the baby immediately placed on the mother's breast by skilled birth attendant within 1 hour after birth. We conducted multivariable logistic regression to determine the factors associated with quality of intrapartum care using SPSS (version 20).

Results

Of the 11,863 women who had recently given birth, about 52.6% had received quality intrapartum care. As part of the intrapartum care, 88.2% gave birth in a health facility, 90.4% obtained assistance from skilled birth attendants, and 59.8% had their babies placed on the breast by delivery assistants within 1 hour after birth. Women who had attained secondary education (aOR = 1.46, 95% CI: 1.23–1.90), were working (aOR 1.24, 95% CI: 1.00-1.53), had > = 3 living children (aOR = 1.31 ,95% CI: 1.02–1.68), took 31–60 minutes to reach the health facility (aOR = 1.49, 95% CI: 1.41–1.95), were assisted during child birth by doctors (aOR = 19.86, 95% CI: 2.89-136.43) and nurses/midwives/clinical officers (aOR = 23.09, 95% CI: 3.36-158.89) had higher odds of receiving quality intrapartum care. On the other hand, women in the richest wealth index (aOR = 0.64, 95% CI: 0.42–0.98), those who gave birth through cesarean section (AOR = 0.27, 95% CI: 0.20–0.36) and those whose current age of their child was > = 2years (AOR = 0.76, 95% CI: 0.60–0.96) were less likely to receive quality intrapartum care.

Conclusions

About half of the women received quality clinical intrapartum care in Kenya, with demographic characteristics seeming to be the main drivers of quality intrapartum care. There is need to empower women through increasing access to education and developing initiatives for their economic independence, as well as facilitating their increased access to skilled birth attendants to improve the quality of intrapartum care.

Introduction

Although labor is a normal physiological process, its related complications account for some of the major causes of mortality and morbidity among women of reproductive age and their neonates in low-income countries [1, 2]. The intrapartum period is defined as the time from the commencement of true labor throughout the first, second, third, and fourth stages of labor [3]. The overall objective of intrapartum care is to enable a mother to give birth to a healthy child with minimum interventions while ensuring the mother's safety [4].

Dimensions of quality intrapartum care may range from clinical to non-clinical care aspects. According to the World Health Organization (WHO), clinical aspects of intrapartum care include delivery at the health facility, skilled personnel assistance, regular monitoring during childbirth, pain management, choice of birth position, immediate kangaroo care and breastfeeding, delayed bathing of the baby until after 24 hours, and continuity of care up to 24 hours before discharge [4–7]. Non-clinical care aspects must accompany clinical intrapartum care [5]. Some of the non-clinical aspects of intrapartum care include respectful maternity care, emotional support during childbirth, effective communication, and companionship during labor, [4–7].

Literature has highlighted the need to work towards providing quality labor through skilled birth attendance and improving delivery experiences as this influences client decisions about facility-based care on the proceeding pregnancies [5, 8]. Poor quality intrapartum care that exposes mothers to negative experiences is a predictor of adverse outcomes among mothers such as post-traumatic stress disorder and dysfunctional personal relationships including poor maternal-infant bonding [9, 10].

The intrapartum period presents the most crucial period for the survival of the mother and neonate especially in circumstances when the quality of intrapartum care is not guaranteed [11, 12]. Research evidence from most low- and middle-income countries indicates that mothers and neonates receive suboptimal quality care during the intrapartum period [13, 14], as the care provided is considered not to depict the recommendations of clinical and non-clinical aspects of intrapartum care as per the WHO standards [4]. Literature has highlighted that only about 61–66% of the components of competent and respectful delivery care were performed in Kenya, indicating a big gap in the care [15].

Studies have found an association between poor quality intrapartum care and increased maternal mortality rates (MMR) [16, 17]. A study in 81 low- and middle- income countries found out that interventions at and around the time of birth are the most critical and account for about 64% of the overall impact on the quality of maternal and child health care [18]. The study also found that MMR decreased by about 21–32% just by addressing gaps in intrapartum care. Sub-Saharan Africa had the highest MMR in 2017 (542/100,000 live births) with Kenya among the 18 countries with the highest incidence [19]. Although the MMR in Kenya has decreased from 362/100,000 live births in 2014 [20] to 355/100,000 live births in 2022, this remain high when compared to global incidence rates [21]. According to the Lancet and World Bank report, the MMR incidence in Kenya is higher than the estimated

global MMR of 223/100,000 live births [22, 23], a worrying indicator of gaps in maternal and newborn care.

Notably, most maternal deaths in Kenya are caused by rather manageable maternal complications during labor [24] and are attributable to sub-optimal care [25]. Some of the associated factors to this sub-optimal care include the lack of knowledge and skills to recognize and address emerging intrapartum complications [26, 27], negative attitudes towards care among health care providers, low staffing levels and demotivation among health care providers, and poor adherence to patient management guidelines [28]. Socio-demographic factors associated with quality of intrapartum care include planned status of pregnancy, number of antenatal visits attended, duration of labor, presence of quality services by region, advanced maternal age, education level and employment status [29–31]. Other factors include the type of facility, availability of routine supplies, distance to facility, in-service training, and supervision of health care providers [12, 32–34].

In 2013, Kenya joined other countries in responding to the call of reducing maternal mortality and morbidity by abolishing delivery fees in all public facilities as per the presidential directive [35, 36]. Despite this directive among many other initiatives, the maternal mortality ratio in Kenya whose direct influencing factor is the quality of intrapartum care [17], still remains higher than the United Nations (UN) sustainable development goal 3.1 target of 2030 of having a MMR of less than 70 per 100,000 live births [37]. Above all, there are currently no nationally representative studies in Kenya exploring the factors associated with the clinical aspects of quality of intrapartum care. Therefore, this study aimed to determine these factors in order to provide insights to policymakers on how to tailor strategies to address the consistently poor quality of intrapartum care in Kenya.

Methods

Data source, sample design, and collection

This study utilized the 2022 Kenya Demographic and Health Survey (KDHS) which employed a two-stage stratified sampling design. Using equal probability with independent selection, the first stage involved the selection of 1692 enumeration areas (EAs) or clusters out of a master sample frame of 129,067 EAs from the 2019 Kenya population and housing census [38]. This was followed by house listing to create a sampling frame that was used in the second stage to select 25 households per cluster. However, all households in a cluster were sampled if they were less than 25. In total, the survey was implemented in 1691 clusters. The Inner-City Fund (ICF) facilitated the pretesting of the study tools and the training of data collectors, and data was collected between February and July 2022. All women aged 15–49 years who were usual members of the selected households or those who had slept in those households the previous night before the survey were interviewed in Swahili or English language [38]. Out of 32,156 women who responded to the survey (95% response rate), 11,863 women had recently given birth within 5 years and these were included in this analysis [38]. We requested the 2022 KDHS dataset and obtained written permission for use from the MEASURE DHS website

(https://www.dhsprogram.com/data/available-datasets.cfm). Although the dataset contains hundreds of variables, only those relevant and applicable to our study were considered and used.

Study variables

Dependent/outcome

The primary outcome of this study was receiving quality of intrapartum care, a composite variable constructed from 3 variables, namely 1) facility-based delivery; 2) receiving skilled assistance during birth, and 3) the skilled birth attendant immediately placing the baby on the mother's breast within 1 hour after birth [39]. Facility-based delivery was further categorized as Yes (giving birth at a public, private, nongovernmental, and faith-based organization's health facility or clinic) or No (others). Receiving skilled assistance was also grouped as Yes (receiving birth assistance from a doctor, and nurse/midwife/clinical officer) or No (others). Lastly, the skilled birth attendant immediately placing the baby on the mother's breast within 1 hour after birth was categorized as Yes or No. Therefore, receiving quality intrapartum care meant a woman receiving all three elements of intrapartum care which was recategorized as a binary outcome (Yes/No).

Independent variables

Based on the literature and availability of the data in DHS, factors included in the analysis were categorized into three namely, sociodemographic, obstetric, and maternal health services, and health facility-related characteristics [31, 34, 39–43]

Sociodemographic factors

We considered ten sociodemographic factors that were included in the analysis. These factors included; age in years (15–19, 20–34, 35–49), education (none/primary, secondary or tertiary), wealth index (poorest, poorer, middle, richer, and richest), residence (rural vs urban), working status (Yes vs No), marital status (single, married, or separated/divorced/widowed), religion (Muslim, Christian, or others), region (categorized into the eight provinces of Kenya; Coast, Northeastern, Eastern, Central, Rift Valley, Western, Nyanza, and Nairobi), household size (≤ 4 vs ≥ 5 members), and maternal autonomy. This was assessed through two proxy variables namely, who heads the household (male vs female) and who makes healthcare-seeking decisions for the mother/participant (self, partner, jointly with partner or another person, or others). The health and well-being of the mother's health status (bad, moderate, good), telephone ownership, and exposure to mass media such as radio, television, newspapers, and internet (Yes vs No) were also included in the analysis. It is worth noting that the wealth index was calculated by 2022 KDHS from information on household asset ownership using principal component analysis [38].

Obstetric, and maternal health services related factors.

Eleven obstetric, and maternal health services-related factors were included in the analysis such as gravidity (prime, multi, and grand multigravida), the number of children ever born, and the number of living children (≤ 2, 3–4, ≥ 5), antenatal (ANC) visits (≤ 3, vs ≥ 4), age at first birth in 5year age groups

(≤ 19yrs, 20-24yrs, 25-29yrs, 30-34yrs, ≥ 35), the birth interval in months (≤ 24 vs ≥ 25), wantedness of the pregnancy (Yes vs No), mode of delivery (vaginal or cesarean), pregnancy outcomes (Born alive, dead, miscarriage, or abortion), pregnancy loss (0 or ≥ 1), and current age of the child in years (≤ 1 vs ≥ 2). The quality of antenatal care as a composite variable was also computed and included in the analysis. The quality of antenatal care was computed from multiple binary outcomes (Yes vs No) which included whether the mother had received eight ANC services such as blood pressure measurement, urine and blood testing, fetal heartbeat monitoring, nutritional, pregnancy danger signs and breastfeeding counseling, and receipt of iron tablets. Receiving all the ANC services meant receiving quality antenatal care (Yes).

Health facility factors

Four variables related to the place of delivery were included in the analysis. These variables included the specific place of delivery (public, private, Non-governmental Organizational (NGO), and faith-based organization (FBO) health facilities or clinics), who assisted the mother during delivery (Doctor, Nurse/midwife/clinical officer, or Others), and being treated with respect at the health facility (all the time, sometimes, or not at all). Time spent to access the health facility before delivery which was measured in minutes (≤ 30, 31–60, ≥ 61) was also added to the analysis as a proxy indicator of geographical access to the health facility.

Statistical analysis

The complex samples package in SPSS (V20) was used to analyze the data, and this accounted for the complex sample design inherent in DHS data [44, 45]. The complex sample package provides valid estimates of parameters because during analysis it accounts for the sample weighting, clustering, and stratification that occurred during the Sampling of the study participants [44, 45]. Additionally, to account for the unequal probability sampling in different strata and ensure the representativeness of the study results, DHS sample weights were applied on all frequencies computed [44, 45]. Before analysis, data was cleaned, and dummy variables were created. At the univariate level, descriptive statistics such as the frequencies were computed for all categorical variables. Pearson chi-square statistics and univariate logistic regression were used to obtain independent factors associated with the quality of intrapartum care. All variables with P-values < 0.25, were entered in simple multivariate logistic regression to establish the factors associated with the quality of intrapartum care while controlling for confounders. All variables' odd ratios are reported at 95% confidence intervals. Multi-collinearity was also assessed among all the predictor variables in the model using a variance inflation factor (VIF) of greater than 10 as a cutoff [45]. None of the factors exceeded the cutoff.

Ethical consideration

No ethical approval to analyze the secondary data was needed because the data is publicly available. However, permission to access the 2022 KDHS datasets was obtained from MEASURE DHS (https://www.dhsprogram.com/data/available-datasets.cfm). Ethical approval to conduct the study

reported in datasets was obtained from the Inner-City Fund (ICF) Institutional Review Board. The study was also implemented by the Kenya National Bureau of Statistics in conjunction with other stakeholders.

Results

Demographic characteristics of the study participants

A total of 11,863 women who had recently given birth were included in this analysis (Table 1). Most were aged between 20–34 years (74.4%) with a mean age of 28.31 years (standard deviation = 6.52), were living in rural settings (61.4%), and were from the Rift Valley province (30.4%). Most had attained primary and secondary education (80.5%), were Christian by religion (88.5%), and married (80.2%). The majority of the participants were working (57.3%), belonged to the richer and richest wealth quintiles (43.9%), lived in male-headed households (71.5%), and belonged to households with more than 5 household members (79%). At the time of the interview, the majority described themselves as being in good health (80.3%) and made decisions to seek health care services jointly with either their partner or somebody else (44.9%). Many of the participants had exposure to the radio (74.3%) followed by the television (38.4%) and newspapers (17.2%). In addition, most of the participants had a mobile phone (81.1%) and nearly half of the participants had access to the Internet (47.9%). In terms of obstetrical characteristics, about half of the participants were multigravidas (53.6%) and had either ever given birth to utmost two children or had utmost two children currently alive (53.9%). The majority had attended at least four antenatal visits (67.2%) and had received quality antenatal care (61.2%). Most of the participants first became pregnant at less than 24 years (87.1%) and had a pregnancy interval of at least 2 years following their previous birth (75.4%) and wanted to conceive their last or current pregnant (91.2%). Many of the participants had undergone vaginal birth (82.9%), assisted by the doctors (62.2%), and delivered at public health facilities (65.2%). Most mothers had taken at most 30 minutes to access the health facilities (73.1%) and were always treated with respect during their stay at the health facilities (87.3%). Many of the mothers had previously given birth to live babies (88.1%), who were currently aged at most two years (68.1%) at the time of the interview. Overall, most of the respondents had never lost a pregnancy either through abortion or miscarriage (77.0%).

Table 1
Demographic characteristics of the study participants

Variable	n (weighted %)
Sociodemographic factors	
Age (years)	28.31 ± 6.52*
15–19	785 (6.6)
20–34	8825(74.4)
35–49	2253 (19)
Residence	
Urban	4574 (38.6)
Rural	7289 (61.4)
Region/province	
Coast	1107 (9.3)
Northeastern	406 (3.4)
Eastern	1336 (11.3)
Central	1380 (11.6)
Rift Valley	3605 (30.4)
Western	1253 (10.6)
Nyanza	1406 (11.8)
Nairobi	1371 (11.6)
Education	
None/primary	5311 (44.8)
Secondary	4231 (35.7)
Tertiary	2321 (19.5)
Religion	
Christians	10220 (88.5)
Muslims	1120 (9.7)
Others	209 (1.8)

*= mean ± standard deviation, ANC = antenatal care, NGO = non-government organization, FBO = faith-based organization

Variable	n (weighted %)
Marital status	
Single	1298(11)
Married	9519 (80.2)
Divorced/widowed/separated	1046 (8.8)
Working status/occupation	
Working	6791 (57.3)
Not working	5063 (42.7)
Wealth index	
Poorest	2523 (21.3)
Poorer	2062 (17.4)
Middle	2074 (17.5)
Richer	2510 (21.2)
Richest	2695 (22.7)
Sex of Household head	
Male	8483 (71.5)
Female	3380 (28.5)
Household number	
≤ 4	2493 (21)
≥ 5	9370 (79)
Health status	
Bad	263 (2.2)
Moderate	2073 (17.5)
Good	9527 (80.3)
Health seeking decision making	
Self	3618 (38.1)
Partner	1590 (16.7)

*= mean ± standard deviation, ANC = antenatal care, NGO = non-government organization, FBO = faith-based organization

Variable	n (weighted %)
Joint	4279 (44.9)
Others	32 (0.3)
Newspaper	
Yes	2037 (17.2)
No	9826 (82.8)
TV	
No	7303 (61.6)
Yes	4561 (38.4)
Radio	
Yes	8809 (74.3)
No	3055 (25.7)
Internet use	
Yes	5684 (47.9)
No	6179 (52.1)
Telephone	
Yes	9626 (81.1)
No	2237 (18.9)
Obstetric, and maternal health services related factors.	
Gravidity	
Primigravida	3392 (28.6)
Multi-gravida	6363 (53.6)
Grand- multi-gravida	2108 (17.8)
Children ever born	
≤ 2	6395 (53.9)
3–4	3360 (28.3)
≥ 5	2108 (17.8)

*= mean ± standard deviation, ANC = antenatal care, NGO = non-government organization, FBO = faith-based organization

Variable	n (weighted %)
Number of living children	
≤ 2	6395 (53.9)
3–4	3360 (28.3)
≥ 5	2108 (17.8)
ANC Visits	
≤ 3	3157 (32.8)
≥ 4	6472 (67.2)
Receiving quality ANC	
Yes	5877 (61.2)
No	3728 (38.8)
Age at first birth (years)	
≤ 19	5503 (47.3)
20–24	4630 (39.8)
25–29	1215 (10.4)
30–34	229 (2.0)
≥ 35	57 (0.5)
Preceding pregnancy interval	
≤ 24 Months	2111 (24.6)
≥ 25 Months	6475 (75.4)
Pregnancy wanted	
Yes	10823 (91.2)
No	1041 (8.8)
Mode of last delivery	
Caesarean section	1867 (17.1)
Vaginal	9043 (82.9)
Pregnancy outcome	

*= mean ± standard deviation, ANC = antenatal care, NGO = non-government organization, FBO = faith-based organization

Variable	n (weighted %)
Born alive	10452 (88.1)
Born dead	176 (1.5)
Miscarriage	1162 (9.8)
Abortion	73 (0.6)
Current Age of the child	
0–11 months	3573 (35.3)
1 yearr	3324 (32.8)
2 years	3230 (31.9)
Pregnancy losses	
≥ 1	2723 (23.0)
None	9140 (77.0)
Health facility factors	
Type of delivery assistant	
Doctor	6506 (62.2)
Nurse/midwife/clinical officer	2954 (28.3)
Others	996 (9.5)
Specific place of delivery	
Home	1246 (11.7)
Public health facility	6927 (65.2)
Private health facility	1796 (16.9)
NGO	31 (0.3)
FBO	574 (5.4)
Other facilities	55 (0.5)
Time to health facility (minutes)	
≤ 30	4515 (73.1)
31–60	1168 (18.9)

*= mean ± standard deviation, ANC = antenatal care, NGO = non-government organization, FBO = faith-based organization

Variable	n (weighted %)
≥ 61	496 (8)
Treated with respect at health facility	
All the time	3833 (87.3)
Sometimes	411 (9.4)
Not at all	145 (3.3)
*= mean ± standard deviation, ANC = antenatal care, NGO = non-government organization, FBO = faith-based organization	

Quality of Intrapartum Care

Overall, about 52.6% (95% CI: 50.6–54.6) of the study participants had received quality intrapartum care (Table 2). As part of the intrapartum care, 90.4% (95% CI: 89.6–91.2) gave birth in a health facility, 90.4% (95% CI: 89.6–91.2) obtained assistance from skilled birth attendants, and 59.8% (95% CI: 57.7–61.8) had their babies placed on the breast, by birth assistants, within the first hour.

Table 2
Component of intrapartum care received by study participants.

Variable	*n*	Weighed% (95%CI)
Overall Quality of intrapartum care	2700	52.6 (50.6–54.6)
Obtaining birth assistance from a skilled health provider	9463	90.4 (89.6–91.2)
Giving birth in a health facility	9328	88.2 (87.3–89.1)
Placing the baby on the mother's breast within 1 hour after birth	3267	59.8 (57.7–61.8)

Factors associated with the quality of intrapartum care.

Table 3 summarizes the factors associated with the quality of intrapartum care in univariate and multivariate logistic regression analysis. After controlling for significant independent variables, multivariable analysis showed that working status of the mother, type of delivery assistant, number of living children, minutes to the health facility, wealth status, current age of the child, and mode of delivery, were statistically significant predictors of receipt of quality ANC. Participating mothers who had attained at least secondary education were 1.46 (95% CI: 1.12–1.89) times more likely to receive quality intrapartum care than those with either none or primary education. Participants who were working were 1.24 (95% CI: 1.004–1.53) times more likely to receive quality intrapartum care than those who were not working. Participants who had received assistance during delivery from doctors were 19.8 (95% CI: 2.88-136.43) times more likely to receive quality intrapartum care than those who received assistance from other professionals, and those who had received assistance during delivery from nurses were 23.09 (95% CI: 3.35-158.88) times more likely to receive quality intrapartum care compared with those who had

received the care from other professionals. Participating mothers who had less than three (> 3) living children were 1.30 (95% CI: 1.02–1.67) times more likely to receive quality intrapartum care compared with those who had given birth to fewer children. Participating mothers who would access the facility within an hour were 1.49 (95% CI: 1.14–1.95) times more likely to receive quality intrapartum care compared with mothers who spent less than half an hour (Table 3).

On the other hand, mothers from the richest compared with those from the poorest quintile and mothers whose children were aged ≥ 2 years compared with those aged ≤ 1 year were 0.63 (95% CI: 0.41–0.97) and 0.75 (95% CI: 0.59–0.95) times less likely to receive quality intrapartum care, respectively. Additionally, mothers who gave birth through cesarean section birth were 0.27 (95% CI: 0.20–0.35) times less likely to receive quality intrapartum care compared to those who had a vaginal birth (Table 3).

Table 3
Factors associated with the quality of intrapartum care.

	Quality Intrapartum care				
Variable	**No, n (%)**	**Yes, n (%)**	uORs (95%CI)	*P*	aORs(95%CI)
Age (years)				0.254	
15–19 (Ref.)	181 (3.5)	162 (3.2)	1		-
20–34	1863 (36.3)	2099 (40.9)	1.25 (0.94 1.66)		-
35–49	388 (7.6)	440 (8.6)	1.263 (0.923–1.72)		-
Residence				0.658	-
Rural (Ref.)	1532 (29.9)	1728 (33.7)	1		-
Urban	900 (17.5)	973 (19)	0.959 (0.796–1.155)		-
Region/Province				< 0.001	
Coast (Ref.)	233 (4.5)	261 (5.1)	1		1
Northeastern	134 (2.6)	60 (1.2)	**0.398 (0.284–0.557) ***		1.110 (0.640–1.925)
Eastern	296 (5.8)	316 (6.2)	0.955 (0.713–1.277)		0.978 (0.638-1.500)
Central	281 (5.5)	267 (5.2)	0.849 (0.616–1.171)		0.715 (0.451–1.135)
Rift Valley	728 (14.2)	818 (15.9)	1.005 (0.787–1.284)		1.018 (0.684–1.517)
Western	191 (3.7)	338 (6.6)	**1.576 (1.161–2.139) ***		1.211 (0.771–1.901)
Nyanza	248 (4.8)	353 (6.9)	1.273 (0.969–1.670)		0.835 (0.543–1.285)
Nairobi	320 (6.2)	287 (5.6)	0.803 (0.500-1.289)		0.758 (0.424–1.354)
Education				< 0.001	

	Quality Intrapartum care				
None/primary (Ref.)	1195 (23.3)	1141 (22.2)	1		1
Secondary	771 (15.0)	1096 (21.4)	**1.488 (1.245–1.780) ***		**1.461 (1.129–1.891) ***
Tertiary	465 (9.1)	463 (9.0)	1.044 (0.833–1.308)		1.009 (0.693–1.469)
Religion				0.001	
Others (Ref.)	54 (1.1)	27 (0.5)	1		1
Christians	2009 (40.2)	2383 (47.6)	**2.378 (1.269–4.456) ***		1.916 (0.760–4.832)
Muslims	302 (6)	228 (4.6)	1.515 (0.762–3.013)		2.102 (0.770–5.739)
Marital status				0.596	
Single (Ref.)	281 (5.5)	281 (5.5)	1		-
Married	1935 (37.7)	2191 (42.7)	1.132 (0.885–1.449)		-
Divorced/widowed/separated	215 (4.2)	228 (4.4)	1.060 (0.740–1.517)		-
Wealth index				< 0.001	
Poorest (Ref.)	638 (12.4)	471 (9.2)	1		1
Poorer	405 (7.9)	518 (10.1)	**1.730 (1.394–2.147) ***		1.014 (0.735–1.398)
Middle	356 (6.9)	579 (11.3)	**2.202 (1.764–2.749) ***		1.157 (0.822–1.629)
Richer	457 (8.9)	652 (12.7)	**1.932 (1.524–2.449) ***		1.016 (0.696–1.483)
Richest	575 (11.2)	481 (9.4)	1.132 (0.872–1.469)		**0.637 (0.415–0.978) ***
Working status/occupation				< 0.001	
Not working (Ref.)	1169 (22.8)	1098 (21.4)	1		1

	Quality Intrapartum care				
Working	1261 (24.6)	1600 (31.2)	**1.351 (1.150–1.586) ***		**1.240 (1.004–1.530) ***
Household number				0.834	
≤ 4 (Ref.)	462 (9.0)	504 (9.8)	1		-
≥ 5	1969 (38.4)	2197 (42.8)	1.023 (0.825–1.269)		-
Sex of Household head				0.254	
Male (Ref.)	1700 (33.1)	1943 (37.9)	1		-
Female	732 (14.3)	758 (14.8)	0.906 (0.765–1.074)		-
Health seeking decision making				0.007	
Self (Ref.)	667 (16.2)	900 (21.8)	1		1
Partner	359 (8.7)	318 (7.7)	**0.655 (0.501–0.856) ***		0.921 (0.675–1.258)
Joint	903 (21.9)	965 (23.4)	**0.791 (0.654–0.957) ***		0.884 (0.711–1.098)
Others	5 (0.1)	7 (0.2)	0.969 (0.235–3.987)		2.554 (0.279–23.339)
Health status				0.967	
Bad (Ref.)	50 (1)	55 (1.1)	1		-
Moderate	421 (8.2)	457 (8.9)	0.973 (0.550–1.723)		-
Good	1961 (38.2)	2188 (42.6)	1.000 (0.549–1.823)		-
Newspaper				0.225	-
Yes	379 (7.4)	469 (9.1)	1.139 (0.923–1.405)		-
No (Ref.)	2053 (40.0)	2232 (43.5)	1		-
TV				0.001	

	Quality Intrapartum care				
Yes	1410 (27.5)	1736 (33.8)	**1.303 (1.116–1.522) ***		1.089 (0.841–1.409)
No (Ref.)	1021 (19.9)	964 (18.8)	1		1
Radio				< 0.001	
No (Ref.)	754 (14.7)	644 (12.6)	1		1
Yes	1677 (32.7)	2056 (40.1)	**1.435 (1.180–1.746) ***		1.105 (0.842–1.450)
Internet use				0.698	
No (Ref.)	1329 (25.9)	1454 (28.3)	1		-
Yes	1102 (21.5)	1247 (24.3)	1.035 (0.872–1.227)		-
Telephone				< 0.291	-
No (Ref.)	509 (9.9)	524 (10.2)	1		-
Yes	1922 (37.5)	2176 (42.4)	1.100 (0.922–1.312)		-
Living children				< 0.001	
≤ 2 (Ref.)	1273 (24.8)	1453 (28.3)	1		1
3–4	637 (12.4)	854 (16.6)	1.176 (0.976–1.417)		**1.308 (1.021–1.675) ***
≥ 5	522 (10.2)	394 (7.7)	**0.661 (0.534–0.819) ***		**1.308 (1.021–1.675) ***
Children ever born				< 0.001	
≤ 2 (Ref.)	1273 (24.8)	1453 (28.3)	1		1
3–4	637 (12.4)	854 (16.6)	1.176 (0.976–1.417)		1.000 (1.000–1.000)
≥ 5	522 (10.2)	394 (7.7)	**0.661 (0.534–0.819) ***		1.000 (1.000–1.000)

	Quality Intrapartum care				
Gravidity				< 0.001	
Primigravida (Ref.)	616 (12.0)	707 (13.8)	1		1
Multi-gravida	1294 (25.2)	1600 (31.2)	1.077 (0.887–1.309)		1.059 (0.788–1.424)
Grand- multi-gravida	522 (10.2)	394 (7.7)	**0.657 (0.523–0.826) ***		0.705 (0.473–1.050)
ANC Visits				< 0.021	
≤ 3 (Ref.)	740 (15.9)	744 (16.0)	1		1
≥ 4	1424 (30.7)	1734 (37.3)	**1.211 (1.029–1.425) ***		1.051 (0.835–1.322)
Receiving quality ANC				< 0.035	
No (Ref.)	864 (18.6)	897 (19.4)	1		1
Yes	1294 (27.9)	1579 (34.1)	**1.175 (1.011–1.365) ***		1.050 (0.855–1.290)
Age at first birth (years)				0.858	
≤ 19 (Ref.)	1143 (22.3)	1316 (25.6)	1		-
20–24	993 (19.4)	1061 (20.7)	0.928 (0.778–1.106)		-
25–29	242 (4.7)	270 (5.3)	0.971 (0.730–1.291)		-
30–34	49 (1.0)	47 (0.9)	0.827 (0.445–1.538)		-
≥ 35	4 (0.1)	6 (0.1)	1.431 (0.351–5.832)		-
Preceding pregnancy interval				0.123	
≤ 24 Months (Ref.)	455 (12.3)	454 (12.3)	1		-
≥ 25 Months	1281 (34.7)	1504 (40.7)	**1.176 (0.957–1.445) ***		-

	Quality Intrapartum care				
Pregnancy wanted				0.663	-
No (Ref.)	195 (3.8)	229 (4.5)	1		-
Yes	2236 (43.6)	2472 (48.2)	0.945 (0.731–1.221)		-
Mode of last delivery				< 0.001	
Vaginal (Ref.)	1813 (35.3)	2429 (47.3)	1		1
Cesarean section	618 (12.0)	272 (5.3)	**0.328 (0.260–0.415) ***		**0.270 (0.204–0.358) ***
Place of delivery				< 0.001	
FBO (Ref.)	124 (2.4)	170 (3.3)	**1**		1
Public health facility	1346 (26.2)	2059 (40.1)	1.121 (0.764–1.643)		1.317 (0.840–2.065)
Private health facility	415 (8.1)	461 (9.0)	0.815 (0.511-1.300)		1.395 (0.796–2.445)
NGO	4 (0.1)	12 (0.2)	1.941 (0.189–19.925)		3.143 (0.315–31.330)
Time to the health facility (minutes)				< 0.001	
≤ 30 (Ref.)	1717 (33.5)	1987 (38.7)	1		1
31–60	448 (8.7)	563 (11.0)	1.086 (0.889–1.326)		**1.492 (1.141–1.951) ***
≥ 61	266 (5.2)	150 (2.9)	**0.488 (0.378–0.628)**		0.822 (0.566–1.194)
Type of Delivery assistant *				< 0.001	
Others (Ref.)	473 (9.2)	2 (0.04)	1		1
Doctor	649 (12.7)	814 (15.9)	**274.352 (70.812-1062.943) ***		**19.855 (2.889-136.437) ***
Nurse/midwife/clinical officer	1302 (25.4)	1878 (36.7)	**315.997 (81.866-1219.727) ***		**23.091 (3.356-158.885) ***

	Quality Intrapartum care				
Pregnancy outcome*				0.167	
Born alive (Ref.)	2414 (47.0)	2690 (52.4)	1		-
Born dead	18 (0.3)	10 (0.2)	0.526 (0.208–1.329)		-
Pregnancy losses				0.315	
None (Ref.)	2128 (41.5)	2326 (45.3)	1		-
≥ 1	303 (5.9)	375 (7.3)	1.130 (0.890–1.436)		-
Current Age of the Child (years)				0.009	
≤ 1 (Ref.)	1565 (31.2)	1880 (37.5)	1		1
≥ 2	650 (11.9)	932 (17.1)	**0.810 (0.692–0.949) ***		**0.758 (0.599–0.958) ***
Treated with respect at health facility				0.797	
Not at all (Ref.)	57 (1.4)	71 (1.7)	1		-
All the time	1486 (35.5)	2175 (52.0)	1.165 (0.737–1.842)		-
Sometimes	164 (3.9)	230 (5.5)	1.119 (0.670–1.869)		-

Bold = significant, at 0.05, CI = confidence interval, —not evaluated in that model, uORs = unadjusted odds ratios, aORs = adjusted odds ratios, Ref. =reference category, ANC = antenatal care, NGO = non-governmental organizations, FBO = faith-based organization.

Discussion

This study aimed to establish the factors associated with the quality of intrapartum care in Kenya using the recently conducted Kenya demographic and health survey. This study indicated that 52.6% of the study participants had received quality intrapartum care. These study finding is higher than the prevalence recorded in other studies in Ethiopia at 27.3% and 13% [12, 46]. As part of intrapartum care, 88.2% gave birth in a health facility which figure is higher than the overall prevalence (66%) for Sub-Saharan Africa [47], and also higher than 81% recorded from a study in a slum of Nairobi, Kenya in 2020

[48], 39.8% recorded from a study in Guinea-Bissau [49] and 76.6% recorded in Uganda [50]. 90.4% of this study participants obtained assistance from skilled birth attendants which finding is somewhat comparable to one from a study in South Africa [51]. However, this study finding indicates a higher prevalence of skilled birth assistance when compared to figures across the sub-Saharan region (60.3%) [52], Tanzania (81%) [53] and Ethiopia (29.2%) [54].

We also found that 59.8% of the skilled birth assistants placed the baby on the breast within the first hour following childbirth. This finding related to the first-hour initiation of breastfeeding is lower than that from other countries in Sub-Saharan Africa like Uganda (68%), Ethiopia (81.8%) and Nigeria (61%) [55–57]. Overall, the seemingly improved quality of intrapartum care and its associated indicators recorded in this study could be explained by Kenya's initiatives to improve maternal and child health outcomes that have been implemented over the years including decentralization of services [35, 36, 58].

In this study, participating mothers who had attained at least secondary education were 1.46 times more likely to receive quality intrapartum care than those with either none or primary education. This study finding is consistent with a study by [59] that found that educated women have better birth preparedness practices as compared to their counterparts and are therefore more likely to receive quality intrapartum care. Literature suggests that educated women are likely to have optimal antenatal care utilization and make informed decisions about maternal healthcare utilization [29, 60, 61]. Mothers who have adequate antenatal care visits receive information and sensitization about preparedness and expectations during labor [62]. Frequent encounters with the health care system by mothers during antenatal visits enables early detection of any foreseeable complications during labor and therefore guide their readiness planning and improve their health-seeking behaviors [39].

Participants who were working were 1.24 times more likely to receive quality intrapartum care than those who were not working. This is in line with a study by [63] that found that employed mothers as compared with housewives, had higher exposure to risk factors of poor intrapartum care such as unplanned pregnancy. Other studies suggest that working women have the capacity and resources to prepare for any necessities during labor and are therefore more likely to have a better experience of intrapartum care [64–66].

On the other hand, this study found that mothers who were from the richest wealth quantile were less likely to receive quality intrapartum care as compared with those from the poorest wealth quantile. This finding, concurs with a study by [67] which found that economically disadvantaged mothers exhibited better birth preparedness and complication readiness practices as compared with their richer counterparts, and are therefore more likely to receive good quality intrapartum care. This discrepancy in findings may be explained by the fact that richer mothers may not see the need to prepare early due to their perceived ability to access any kind of health facility, and are therefore more likely to be caught off-guard when labor sets in.

Participating mothers who had three or more living children were 1.31 times more likely to receive quality intrapartum care compared with those who had given birth to fewer children. Considering the number of

children as a measure of parity, a study by [68] found that high parity is associated with proper birth preparedness and complication readiness. Multiparous women have a lot more labor experience accumulated from their previous pregnancies, therefore, know what to expect, how to prepare for it in advance, and what to demand for in terms of services. Contrary to this study finding, other studies have found that primiparous women are better prepared for delivery and its complications due to the excitement of having the first child [59, 69, 70].

Participating mothers who accessed the facility within an hour were more likely to receive quality intrapartum care compared with mothers who accessed the health facility within less than 30 minutes. This finding is inconsistent with those from many other studies that suggest that mothers who take long to reach health facilities due to long distances and transportation challenges are likely to receive poor quality intrapartum care [12, 71]. This discrepancy in findings may be explained by the fact that mothers who take longer to reach the facility are likely to arrive in a poor health state with complications due to the delays and are therefore given more attention by the health care workers as compared to their counterparts who reach the facility when no complications have happened. Also, mothers who take a little longer to reach their preferred health facility could be seeking for better health services and are therefore likely to receive quality care.

Study participants who had received assistance during delivery from doctors and nurses/clinical officers/midwifes were 19.89 and 23.09 times respectively more likely to receive quality intrapartum care than those who received assistance from others such as traditional birth attendants, or relatives. Skilled birth attendance has been highlighted as one of the best strategies in improving maternal and neonatal outcomes during labor [72]. The World Health Organization has highlighted the need to increase access to skilled birth attendance to reduce maternal mortality resulting from intrapartum period by preventing complications and timely interventions on those that arise [73]. Traditional birth attendants lack basic knowledge, skills and resources to handle complications during labor in addition to cultural practices like use of herbal medicines which may not be safe, compromising the quality of intrapartum care provided [74].

On the other hand, mothers who gave birth through cesarean section were less likely to receive quality intrapartum care compared with those who had a vaginal birth. The reason for the finding is unclear and warrantees further qualitative study exploration however this could be explained by several complications associated with cesarean section like excessive bleeding, abdominal pain, and incision hernias that call for a lot of interventions to mitigate them [75, 76]. As compared to normal vaginal deliveries, cesarean section procedures are associated with a lot of instrumentation increasing chances of errors, in addition to the fact that these are always uncomfortable and strange to mothers.

This study also found that women whose children were two years and above were less likely to receive quality intrapartum care as compared with those whose children were one year and below. This finding may be due to the fact that Kenya has had many community-owned and participation initiatives over the years to improve maternal and child health care, which may have enabled mothers to gradually access

quality intrapartum care. [77], Therefore, those mothers who delivered recently might have interfaced with an improved healthcare system as compared to those who delivered some years back. In summary, these findings seem to suggest that demographic characteristics compared with other factors are the main drivers of quality intrapartum care.

Study Limitation and strength.

This study findings were drawn from data of a nationally representative sample population. Few studies in Kenya had explored the clinical aspects of quality of intrapartum care, using a nationally representative sample population. Therefore, this study findings are generalizable to women who have given birth in Kenya and can be used to tailor interventions aimed at addressing gaps in the quality of intrapartum care at a national level. In addition, the use of complex sample analysis, ensured that the results presented are reliable.

However, this study utilized a cross-sectional design meaning the findings confer association rather than causality. The study findings are also subject to recall bias because respondents were interviewed about past childbirth events. Additionally, this study did not include non-clinical aspects of quality intrapartum care because of missing data on such variables. Such information may have enriched this study and future studies need to consider it. Despite these limitations, this study provides useful information about the predictors of quality of intrapartum care in Kenya.

Conclusion

In this study, only half of the women received quality intrapartum care in Kenya. Various socio-economic factors were associated with the quality of intrapartum care, for example, secondary education, working status, number of living children, minutes to the health facility and type of delivery assistants whereas the richest wealth quantile, the current age of the child and caesarian section delivery were predictors of low-quality intrapartum care. These findings seem to suggest that demographic characteristics compared with other factors are the main drivers of quality intrapartum care.

There is need for women empowerment through increasing access to education and initiatives that facilitate their economic independence in a bid to address knowledge and financial gaps. This will in turn address the socio-economic challenges that could be hindering skilled birth attendant utilization hence improving the quality of intrapartum care. Support supervision and monitoring should be conducted in health facilities authorized to conduct deliveries by caesarian section. In-service training of health care providers involved in care of patients delivering by caesarian section should also be carried out to improve and replenish their knowledge and skills to improve the overall quality of intrapartum care.

Abbreviations

MMR	Maternal Mortality Ratio
WHO	World Health Organization
KNBS	Kenya National Bureau of Statistics
UN	United Nations
EA	Enumeration area
aOR	Adjusted Odds Ratio
KDHS	Kenya Demographic Health Survey
CI	Confidence Interval
DHS	Demographic Health Survey
VIF	Variance Inflation Factor
uOR	Unadjusted Odds Ratio
OR	Odds Ratio
SPSS	Statistical Package for Social Science

Declarations

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Availability of data and materials

In this study, the data set used is openly available upon permission from the MEASURE DHS website (URL: https://www.dhsprogram.com/data/available-datasets.cfm). However, authors are not authorized to share this data set with the public but anyone interested in the data set can seek it with written permission from the MEASURE DHS website (URL: https://www.dhsprogram.com/data/available-datasets.cfm).

Authors' contributions

L.N and J.B.A Conceived the idea, drafted the manuscript, performed analysis, interpreted the results, and drafted the subsequent versions of the manuscript. E.A, Q.S, J.K, M.A and A.N reviewed the first draft, helped in results interpretation and drafted the subsequent versions of the manuscript. All authors read and approved the final manuscript.

Ethics approval and consent to participate.

High international ethical standards are ensured during MEASURE DHS surveys and the study protocol is performed following the relevant guidelines. The 2022 KDHS survey protocol was reviewed and approved by the ICF Institutional Review Board. Written informed consent was obtained from human participants and written informed consent was also obtained from legally authorized representatives of minor participants.

Consent for publication

This is not applicable.

Competing interests

All the authors declare that they have no competing interests.

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