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Appreciating the Essence of Post Natal Care Services from Mothers' Perspective in Kiambu, Kenya

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Authors' contributions

This work was carried out in collaboration between all authors. Author NMN designed the study, managed the literature searches and wrote the protocol. Authors GOO and PM managed the execution of the study. Author SKC performed the statistical analysis and wrote the first draft of the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: The first 42 days after delivery is a critical period in the lives of mothers and newborn babies. Most maternal and infant deaths occur during this time. The government of Kenya has recommended that all mothers and newborns receive three postnatal (PNC) checkups this period. These are; within 48 hours before discharge from post-natal ward, at 2 weeks and again at 6 weeks. Nonetheless, uptake of postnatal services particularly visit two remains low. For instance 25% of mothers in Kiambaa Sub County access PNC at two weeks.
Study Design: A cross sectional descriptive study design was conducted among 399 mothers to determine the factors that influence utilization of PNC services.
Study Area and duration: This research was undertaken in Kiamba, Kiambu County between August and September, 2013.

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Methodology: This was a mixed qualitative and quantitative study. Simple random sampling was used to select participating administrative units and respondents selected systematically. Sample size distribution was by probability proportionate to size. Quantitative data was analyzed using Stata version 13, while qualitative data was analyzed manually based on themes.
Results: Utilization of PNC services was at 45.1%. Over half (53%) of the respondents made their first PNC post-delivery visit after 14 days, 11% and 36% within 7 and 14 days respectively. The health care workers had informed only 15 % of the women, to attend the PNC services. College education (OR=12.292, p<0.001); high household wealth status (OR=3.6211, p<0.001); formal employment (OR=2.705, p=0.008); delivery at a private facility (OR=2.9269, p< 0.000) and high knowledge of PNC services (OR=2.2307, p=0.008) were synonymous with utilization of PNC services. Perceived good quality of care (OR=5.2607, p< 0.000), and a positive attitude (OR=3.6507, <0.000) were other determinants.
Conclusion: Uptake of postnatal care services remains a challenge among mothers and is predicted by several overt and covert constraints. Quality of delivery services and providers respective care practices were key predictors. Nevertheless, close to half of the women sought postnatal care at least twice in the post-natal period. The services were mainly accessed at or after 6 weeks. The timing of first PNC, post- delivery visit varies. Uptake of PNC visit two remains low.

Keywords: Utilization; post natal services; quality of services and mothers' perspectives.

1. INTRODUCTION

1.1 Maternal and Child Health Trends

Globally, maternal and child health remains a major challenge [1]. The global Maternal Mortality Ration (MMR) in 2013 was 210 maternal deaths per 100 000 live births, developing countries accounted for 99% of these deaths and Sub-Sahara alone accounting for 62% [2]. The adult lifetime risk of maternal death as measured in 2013 is highest in sub-Saharan Africa (at 1 in 31), in contrast to 1 in 3800 in developed countries. In Kenya, the adult lifetime risk of maternal death is 1:55 [3] translating to maternal mortality ratio of 400/100,000 live births. These maternal deaths represent 11.3% of all deaths among women aged 15-49 years; which has largely remained unchanged over the last 10 years [2]. The most common causes of maternal mortality in sub-Saharan Africa include haemorrhage (34%), sepsis/infections (10%), hypertensive disorders (9%), HIV and AIDS (6%) and other direct causes (5%); other indirect causes contribute approximately 17%. In addition to maternal deaths, almost 40% of women experience complications after delivery and an estimated 15% develop potentially life-threatening problems. Infants are not spared either; of the approximately 130 million infants born annually, four million infants die in the neonatal period, representing almost 40% of deaths of children below 5 years of age and developing countries account for 98% of these deaths. Over 25% of these deaths occur in Africa. The causes of neonatal deaths are preterm birth (40.8%) and intra-partum complications (27.0%) and nearly half of all deaths occur from infectious causes 47.6% [2].

Owing to these dramatically increased risks, it is essential to provide a seamless continuum after birth. Care in the period following birth is critical not only for survival but also to the future of mothers and newborn babies [2]. Major changes occur during this period that determines their well-being and potential for a healthy future. The period is defined by World Health Organization [4], as the period one hour after the delivery of the placenta and includes the six weeks that follow. This period is called postpartum period when referring to the mother alone and post-natal when referring to both mother and baby. The services provided during this period are referred to as post-natal care (PNC) services. Post-natal care (PNC) services are aimed at maintaining and promoting the health of the woman and her baby and to foster an environment that offers help and support to family and community on health needs [2,5]. These needs involve physical and mental health as well as social and cultural issues that can affect health and wellbeing. Additionally, new parents need support for parenting and its responsibilities. The principle is to promote the delivery of individualized and customized post-natal care in partnership with the woman and her family [6]. World Health Organization suggests that post-natal period covers "crucial" and critical moments when contact with the formal health system could be instrumental in identifying and responding to needs and complications after

childbirth [2]. On the other hand, childhood mortality rates are identified as basic indicators of a country's socio-economic level and quality of life. Child health remains a challenge and needs more attention. Despite renewed focus and recent progress in child survival, a lot of effort need to be directed at child health to achieve the global goal of ending preventable deaths of newborns and under-five children by year 2030 [1].

The post-natal period covers a critical transitional time for a woman, her newborn and her family on a physiological, emotional and social [2]. Post-natal period care enables health professionals to identify potential complications in newborns, and to provide treatments promptly as well as initiating vaccinations. However, it has been noted that many women who give birth at health facilities in the developing world are discharged within hours after childbirth without an appointment for further care and/or support [7,8].

1.2 Kenya Context

In Kenya, this has remained a neglected area in child and maternal health-care services. The PNC guidelines recommends three visits- within 48 hours before discharge from post-natal ward, at 2 weeks and again at 6 weeks [5]. Although, the general PNC utilization has marginally increased nationally from 47% in 2009 [9] to 51%, visit two remains low [10]. For example, only about 25% of mothers who deliver in facilities in Kiambaa Sub County access PNC at two weeks [11]. This is far from the desired universal access of all maternity services [2,12]. Identification of the gaps in the use of PNC services is paramount for improved maternal child health strategies. The study adopted Andersen's Behavioral Model to discover the conditions that either facilitate or impede consumption of a service [13]. The model advocate that the use of health services is a function of the predisposition to use the services, factors that enable or impede use and need for the service.

2. MATERIALS AND METHODS

2.1 Study Design and Participation

The study used a cross-sectional design with quantitative and qualitative methods. The study population comprised women in the reproductive age group (15–49 years old), residing in study areas, whose previous delivery was within one year preceding the study and the infant was more than two weeks old and less than 12 months. Quantitative data was collected using interviewer administered structured questionnaire while qualitative research was conducted through focus group discussion and informant interviews. Descriptive and inferential statistical analysis by chi-square test and logistic regression were used.

2.2 Study Area

The study was carried out in Kiambaa sub-County in Kiambu County within the greater Nairobi City. This is a unique area with an increasing urban population and is predicted to be anchor to the capital city, Nairobi. It also has as a large high-density rural population. It covers an area of 2,449.21 Sq. Km and a Population of 1,623,282 (National Census 2009). The county is endowed with several hospitals. The ANC attendance and skilled delivery are at 97% and 92.6% respectively [10]. In contrasts, PNC utilization at visit two remains low at 25% [11].

2.3 Sampling and Sampling Procedure

Purposive and random sampling techniques were applied**.** Kiambaa sub-County was purposively sampled. The sub-county is made of four locations and two were randomly selected. In each location, two sub-locations were again randomly picked. The study respondents were then drawn from the sampled sub locations. Systematic random sampling was applied. Households without a women with a child below one year were replaced until the desired sample size was obtained. Probability proportionate sampling to size was applied. The sample size was calculated using Fisher et al. of 1998 [14] with 95% confidence interval, a precision of 0.05 and proportion of interest of 47% [11]. The first respondent was identified randomly.

2.4 Study Response Model and Data Analysis

A binary response model was used for this study because the dependent variable PNC utilization is binary with only two possible outcomes (PNC utilization or none). The probit model was used both to estimate the impact of the independent variables on PNC utilization and to predict probabilities of change in PNC utilization under several simulated variable levels. Utilization of

PNC services was looked at from two aspects; proportion of mothers who utilized services and timing of the visits in the post-natal period. In this study, a woman was deemed to have utilized services if she was attended to, at a health facility at least twice in the post-natal period (within 42 days). Chi-square test was applied to observe significant association at bivariate. The significant variables were subjected to multinomial regression to determine category significance. Data were entered and analyzed using the Stata version 13 [15]. Pearson's chi-square test was used to find association between nominal categorical factors and utilization of postnatal care. The Fisher's exact test was used whenever count cells were less the five. Chi-square test for trend was used for association of ordinal categorical factors and postnatal care. The Odds Ratio (OR) and its 95% Confidence Interval (CI) were calculated to measure the strength of the association between significant variables at bivariate and postnatal care.

2.5 Ethical Considerations

The research observed ethical principles and guidelines for the protection of human subjects of research. Ethical approval for conducting the study was obtained from the Kenyatta University ethical review committee and National Commission of Science, Technology, and Innovation Kenya (NACOSTI). Likewise, the right to briefs, consenting and confidentiality were maintained.

3. RESULTS

3.1 Demographic Information of Respondents

The results are derived from 399 respondents. The average age was 26± 4.9 years while the median number of children was two. Majority of the respondents were Christians (97%) and Married (75.7%). Many of the women were literate, with parity in primary (29.8%) and post-secondary (27.1%) while the remaining (43.1%) had secondary school education. Similar level of education for the spouses were reported. Most of the spouses were formally employed (41.4%), self-employed (32.1%) while 26.2% were casuals.

3.2 Utilization of Post Natal Care Services

The uptake of postnatal care services was 45.1%. Notably; over half (53%) of the women sought postnatal care in a health facility for the first time after more than 14 days post-delivery, while 11% and 35.6% within 7 days and between 7-14 days respectively. Several reasons informed the timing of care. These included; child check-up (71%), wellness of the baby and mother (58.2%), child immunization (30%) as crosscutting compound reasons. Similar reasons were advanced in qualitative study. One focus group discussant stated, "*We go to the clinic primarily for the baby's health".* Another mother echoed, "*I take the baby at two weeks for immunization and to have the baby weighed*". Likewise, key informant noted that few women go for PNC for their own wellbeing *"PNC services are associated with the baby's health and few women go for their own health, unless there are complications".*

Lack of awareness on the importance of PNC services (69.1%) and perception that the visit was unnecessary as long the mother and baby were well (43.6%) were inhibitive factors. This was well explained by FGD one participant who said, *"Asking us to attend clinic two weeks after delivery is too early; one can hardly walk".* There was a rejoinder, "There *is no need of going to clinic so soon after delivery if the baby is fine and am fine".* A third participant said that "*it was a waste of time going to the clinic soon after delivery if the vaccinations for the baby are not due."* Many reported that they had not been informed about the visit at two weeks. This was in congruence with the sentiments of one key informant who said, *''The focused PNC visits is a new concept and many of the HCW may not be aware of it and are used to the six week visit".* Socio cultural barriers was explored during the FGDs but none was cited.

3.3 Individual Factors in Relation to Utilization of Post Natal Care

Table 1 shows the socio-demographic factors and uptake postnatal care. Post-natal care was significantly associated with woman's level of education χ^2 =99.3; df=2; p<0.001) with bias to college education. Similarly, spouse level of education (χ^2=56.69; df=2; p<0.001) statistically influenced uptake of postnatal care.

Women whose spouse was educated upto college level 81 (72.3%) were more PNC services utilizers compared to those whose spouse had secondary education (26.2%) or primary education (27.9%). Uptake of post-natal care was not significantly different among diverse

age groups (χ^2 = 8.7 df 4, p = 0.07), religion (Fischer's Exact p-value= 0.86), marital status (χ^2=2.01; df=2; P=0.37), women's number of children (χ^2=0.04; df=2; p=0.98) at 95% confidence interval. The finding on parity was crowned by a multipara mothers during FGD who said; "*I have delivered several times and I have the experience to look after myself and the baby".* Employment (χ^2=39.4; df=3; P<0.001) was synonymous with PNC utilization. Employed respondents were utilizers (32.7%) than self-employment (24.4%). Narratives from FGD seconded this finding. During FGD the mothers said; "*Women in formal employment enjoy maternity leave and are thus able to visit the clinic several times".* Another said; *"Those in casual jobs do not have the luxury of visiting the clinic as often as may be required because every day matters and they have to work daily, and some even resume work within a week after delivery".*

The wealth status of respondents house hold (χ^2= 23.57; df=2; p <0.001) was associated with postnatal care. This wealth status variable was calculated based on household's ownership of selected assets. All the interviewed households were categorized into three groups; lowest, the middle and the highest. The utilization of PNC services was uppermost (43.9%) among wealth

Table 1. Individual factors in relation to utilization of post natal care

Variables	Utilization of PNC services			Bivariate analysis		
	Utilized *	Did not *	Total+	χ^2	df	p value
Respondent's age						
<19	4 (20.0)	16 (80.0)	20 (5.0)	8.70	4	0.069
20-24	67 (42.1)	92 (57.9)	159 (39.9)			
25-29	68 (52.7)	61 (47.3)	129(32.3)			
30-34	33(44.6)	41 (55.4)	74(18.5)			
>35	8 (47.1)	9 (52.9)	17 (4.3)			
Level of education						
Primary	31 (28.7)	77 (71.3)	108 (27.1)	99.3	2	0.000
Secondary	50 (29.1)	122 (70.9)	172 (43.1)			
College	99 (83.2)	20 (16.8)	119 (29.8)			
Marital status						
Married	131 (43.4)	171 (56.6)	302 (75.7)	2.01	2	0.37
Singles	31 (53.5)	27 (46.5	58 (43.1)			
Divorced	18 (46.2)	21 (53.8)	39 (29.8)			
Parity						
1	58 (44.6)	72 (55.4)	130 (32.6)	0.041	2	0.98
2-3	97 (46.3)	118(54.8)	215 (53.9)			
>4	25(46.3)	29(53.7)	54 (13.5)			
Employment status						
self-employed	44 (30.4)	65 (59.6)	109 (27)	39.3	3	0.000
casual	27 (50.9)	26 (49.1)	53 (13)			
formal	59 (73.8)	21(26.3)	80 (20)			
housewife	50 (31.9)	107 (68.2)	157 (40)			
Spouse education						
Primary	12 (27.9)	31 (72.1)	47 (15.6)	59.69	2	0.000
Secondary	38 (26.2)	107 (73.8.)	145 (48.0)			
College	81 (72.3)	31 (27.7)	110 (36.4)			
Wealth status						
Lowest	41 (32.8)	84 (67.2)	125 (34.7)	23.57	2	0.000
Middle	56 (48.3)	60 (51.7)	116 (32.2)			
Highest	76 (63.9)	43 (36.1)	119(33.1)			
Religion				Fischer's Exact		
Muslim	4 (33.3)	8 (66.7)	12 (3.0)	p-value= 0.86		
Catholic	71 (47.6)	78 (52.3)	149(37.3)			
Protestant	105 (44.1)	133 (55.9)	238(59.7))			

*Abbreviations: n = total number of respondents, χ^2 = Chi square test; df= degree of freedom. *Column percentages, + row percentage; fisher exact test applied appropriately*

women ranked highest by wealth status variable as compared to those women who ranked middle (30.6%) and lowest (23.6%). This finding resonated with qualitative finding that facility visit is informed by availability of resources. This was well captured by one FGD mothers who said*; "Going to the clinic requires money which is not enough",* another echoed, *"It is not just about money for paying for services, you just need to have some extra money to buy medicines and other provisions".*

3.4 Health Systems Factors Relative to Utilization of Post Natal Care

Table 2 tabularizes the factors examined under health systems. Distance to health facility (χ^2 = 9.97 df=1; P=0.002) was synonymous with utilization. Respondents were asked to name the mode of transport, one used to the nearest health facility. Utilization of PNC services was significantly different by mode of transport (Fischer's exact p-value<0.001). Uptake was identical to private transport (92.1%) than public (52.2%) and walking (20%). Mothers were asked how much they were required to pay to access post-natal services. Cost was in levels: Free services (48%), those who paid <ksh100 (28%), those who paid between Ksh 101-500 (12%) and those who paid from Ksh 501 or more (12%). The cost of care was one and the same with utilization of PNC services (χ^2=33.17; df=3; p=<0.001) The proportion of those utilizing PNC services was highest among those who paid more than Ksh.500 at 77.6% and lowest among those who had free services at 34.6%. However, cost was not conclusive from qualitative research. For example, mothers reported that they did not mind paying as long as they were attended to quickly and got the services they wanted while others reported that clinic visits required money to buy medicines and supplies and this put them off. From the study, mothers delivered in four places; in public health facilities (57%), private health facilities (22%), faith-based health facility (17%) and home (4%). Place of delivery influenced utilization of PNC services (χ^2=26.63, df=3, p<0.001). Faith based health facilities had the highest utilizers (67%). The quality of services may explain these, as expounded from qualitative findings.

Table 2. Health systems factors relative to utilization of post natal care

Variables	Utilization of PNC service (n=399)			Bivariate analysis		
	Utilized*	Did not*	Total+	χ^2	df	p value
Distance to facility						
< 5 km (n=330)	137 (41.5)	193 (58.5)	330 (82.7)	9.97	1	0.002
> 5 km (n=69)	43 (62.3)	26 (37.7)	69 (17.3)			
Services fees (Ksh)						
Free	65 (34.6)	123 (65.4)	188 (47.1)	33.17	3	0.000
1- 100	49 (44.1)	62 (55.9)	111(27.8)			
101-500	28 (59.6)	19 (40.4)	47 (11.8)			
>500	38 (77.6)	11 (22.4)	49 (12.3)			
Place of last delivery						
Government hospital	92 (40.2)	137 (59.8)	229 (57.4)	26.63	3	0.000
Private hospital	57 (66.3)	29 (33.7)	86 (21.5)			
Mission Hospital	11 (66.7)	5 (33.3)	15 (3.8)			
Home	21 (30.4)	48 (69.57)	69 (17.3)			
Four ANC visit				4.62	1	0.032
Yes	171 (46.7)	195 (53.3)	366 (91.7)			
No	9 (27.3)	24 (72.7)	33 (8.3)			
Quality of care						
Good	137 (73.3)	50 (26.7)	187 (46.9)	48.87	2	0.000
Average	57 (41.1)	82 (58.9)	139 (34.8)			
Poor	25 (34.3)	48 (65.8)	73 (18.3)			
Mode of transport				Fischer's exact		
Walking	27 (20.0)	108 (80.0)	138 (34.7)	p-value=0.000		
Public transport	118 (52.2)	108 (47.8)	226 (56.8)			
Private transport	35 (92.1)	3 (7.9)	38 (9.5)			

*Abbreviations: n = total number of respondents, χ^2 = Chi square test; df= degree of freedom. *Column percentages, + row percentage; fisher exact test applied appropriately*

During FGD one mother who delivered at a private facility reported; "*The nurses were very kind and helpful I had no problem going their several times to ask for assistance"*. Another said, "*I declined to go to the clinic as informed because I felt they just wanted money as I was feeling well and the baby was fine as well*. This was seconded by a rejoinder from a mother using the public facility who said, "*The nurses are unfriendly and the queues are so long, that put me off"*. A statement expounded by Key informant, who said, "*There is shortage of nurses at the public facilities resulting in delayed services and clients may not get enough attention.* Similarly, attendance of fourth ANC visit (χ^2 =4.62 df =1 p=0.032) influenced utilization of PNC services. Higher proportion (95%) of women who attended the fourth ANC visit utilized the PNC services compared to those who had not completed (5%). This finding was explained qualitatively. During FGD the mothers stated that at the fourth ANC visit they received a lot of counselling on the post-natal care, one of the mothers reported "*she used to wait until 6 weeks to start PNC care but with the last pregnancy she was encouraged by the nurse to go after two weeks".*

Women were asked several questions, which assessed perceived quality of care received during their most recent health facility visit. These questions were designed using a 5-point likert scale and they included; friendliness of health workers, availability of staff when needed, privacy accorded during examination, availability of medicines, reasonable health facility working hours, and cleanliness of facility. The clients were asked to rank their experience from 1 to 5 representing very poor to very good servicers respectively. Using these questions, a composite quality of care indicator was constructed whereby nearly half of the women perceived quality of services as poor 46.6%, while 34.8% and 18.1% perceived health services as average and good quality respectively. Utilization of PNC services was significantly associated with the woman's perceived quality of health services (χ^2=48.87, df = 2; P<0.001). The reasons adopted from qualitative finding ranged from facility opening late, absenteeism and unfriendly staff. In, FGD sessions participants reported that; *"The nurses often report to work late and take long breaks thus keeping us in the facility for too long and we have numerous chores to complete at home".* Another participant asked; ''*Could the facility open on saturdays to enable us to attend with our spouses?"* Several mothers reported that they preferred being attended to by the Traditional Birth Attendants (TBAs), one said *''The TBA does not keep you waiting and is available at any time''.* Another had this to say; *"The nurses were very rude to me during delivery I cannot go back there".* Another added, *"You are in pain and all she (nurse) does is give you a harsh and rude answers; that is why I don't go to the hospitals, I am not used to somebody who roughs me up."* Key informant said, *"The work load is high and the nurses may not have much time to spend with a client and this may make the client feel rushed, though undignified care cannot be ruled out.*

3.5 Knowledge and Attitude in Relation to PNC Utilization

Knowledge regarding PNC services was inquired using a 5 point Likert scale, included knowledge of; breast feeding counseling, mother health check, health check on baby, immunization, family planning, HIV counseling and nutrition guidance services. Using these questions, a composite knowledge indicator was constructed whereby slightly over a quarter of the women were categorized as very knowledgeable about PNC services (28.6%), while 50.1% and 20.8% of woman had average and low knowledge respectively. Utilization of PNC services (χ^2 =9.26, df=2; P= 0.010) was significantly associated with the woman's' knowledge of the services offered during PNC. This however, contrasted, with results from qualitative finding, which reported low awareness levels as captivated by FGD: One mother said, "*The only PNC services that I know off, is immunization for the baby and the family planning Clinic.''* Another echoed this and said *''these are the only two services that take us to the facility after delivery and these are offered at six weeks after delivery.* Several said, *"We do not know about the two weeks visit, and the return date I received was for sixth week.*

Likewise, attitudes regarding PNC services was assessed using a 5-point Likert. Using these questions, a composite indicator was constructed whereby more than two thirds of the respondents' (69.4%) had positive attitude towards PNC services. utilization of PNC services was associated with the woman's attitude towards PNC services (χ^2 =13.19, df=1; P< 0.001). For instance, during FGD when asked if they would in future utilize the PNC service as per guidelines from the G.O.K one

Table 3. Knowledge and attitude in relation to PNC utilization

Variables	Utilization of PNC service (n=399)			Bivariate analysis		
	Utilized *	Did not *	Total+	χ^2	df	p value
Attitude on PNC services						
Positive	143 (51.6)	134 (48.4)	277 (69.4)	13.19	1	0.000
Negative	39 (32.0)	83 (68.0)	122 (30.6)			
Knowledge on PNC services						
PNC High	57 (50.0)	57 (50.0)	114 (28.6)	9.26	2	0.010
Average	97 (48.5)	103 (51.5)	200 (50.1)			
low	26 (30.6)	59 (69.4)	85 (21.3)			

*Abbreviations: n = total number of respondents, χ^2 = Chi square test; df= degree of freedom. *Column percentages, + row percentage; fisher exact test applied appropriately.*

mother said *''No I still feel the visit at six weeks is enough," another said "I would only go to the facility before the immunization at six weeks if the baby or I; are unwell."* Another felt that it is important to keep the appointments as given by the health care workers; *she* said. *''They know the best for us.''* key informant said "*There is need to educate the community on post-natal services because the mothers feel that they do not need further care after delivery; that is the reason between the high proportions of mothers attending ANC compared to PNC services."* Majority of the women were resolute that PNC services are for the child's welfare.

3.6 Multinomial Logistic Regression Analysis on Determinants of PNC Utilization

A multinomial logistic regression analysis was performed on multiple factors to eliminate confounding factors and examine the effect of predictive factors, which significantly associated (independently), with utilization of PNC services at bivariate analysis. The results are tabulated in Table 4. Women's level education was significant; those with college education were more likely to be utilizers (OR=12.292, p<0.001) compared to those with primary level. Utilization of PNC services was enhanced with employment status with those respondents who were in formal employment being more likely to utilize the services compared to those who were self-employed or in the casual employment. Similarly, household wealth index boosted respondent's utilization level; those in high income (OR=3.6211, p<0.001) and middle-income earners (OR= 1.9121, p=0.015) respectively were more likely to seek PNC service than those in low-income category.

Adjusting place of delivery, respondent who delivered in private and mission hospitals respectively were three times more likely to be PNC service utilizers (OR 2.926912, P<0.001) and (OR 2.978261, P=0.053) than respondents who delivered in government facilities. Mode of transport affected utilization of PNC service. Walking to a health facility (OR 0.0214, P<0.001) and using a public transport (OR 0.0936, P<0.001) reduced the odds of seeking PNC services compared to those using private transport. Utilization of PNC services were inversely proportional to cost. Knowledge of services was directly proportional to services utilization. Utilization was synonymous with highly knowledgeable people (OR=2.2307, p=0.008) than low. Quality of service endeared people to be utilizers. Those who perceived quality of care to be good and average were 4 (OR 3.9941753-, P<0.001) and 5 (OR 5.260799, P<0.001) times more likely to be utilizers compared to those who perceived care to be poor. Similarly, attitude to PNC service was a predictor. Those who had positive attitude (OR=3.6507, p<0.001) towards PNC services more likely to be utilizers compared to those who had a negative attitude.

4. DISCUSSION

4.1 Post-natal Care Services

In this study only 45.1% of the respondent met the threshold by Ministry of health (MOH) Kenya which recommend women to attend PNC at least twice during the first 42 days post-delivery. This denotes that PNC services remains underutilized and poor. Secondly, its remains the weakest in the maternal neonate continuum of care compared to ANC attendance of 98% and Delivery with skilled attendance of 70% [10]. This means that continuum of care is disrupted during this critical period, when lack of appropriate care could result in significant ill health and even death. This finding resonates across Africa [16]. In Ethiopian, the attendance of PNC within six weeks after childbirth was only

Table 4. A multinomial logistic regression analysis on determinants of PNC utilization

A multinomial logistic regression analysis							
Variable		**Odds Ratio**	**Std. Err.**	**z**	**P>|z|**	**95% confidence interval**	
Woman's education	Primary	Ref		-			
	Secondary	1.01798	0.2758	0.07	0.948	0.5984	1.73147
	College	12.2915	3.9906	7.73	**0.000**	6.5081	23.2278
Employment status	Self employed	0. 6518519	0. 2197	-1.27	**0.020**	0.3366	1.26199
	Casual	Ref		-			
	Formal	2.705466	1.0125	2.66	**0.008**	1.2991	5.63389
	Housewife	0. 4499827	0. 1457	-2.47	**0.014**	0. 2385	0. 84881
Wealth index	Lowest	Ref					
	Middle	1.912195	0. 5088	2.44	**0.015**	1.1350	3.22145
	Highest	3.6211	0.9764	4.77	**0.000**	2.1346	6.14275
Distance to facility	<5 km	0.4292082	0.1169	-3.11	**0.002**	0.2515	0.73203
	>5 km	Ref					
Mode of transport	Walking	0.0214286	0.1369	-6.02	**0.000**	0.0061	0.07496
	Public	0.0936508	0.5770	-3.84	**0.000**	0.0279	0.31331
	Private transport	Ref					
Place of delivery	Government	Ref					
	Private	2.926912	0.7754	4.05	**0.000**	1.7413	4.91960
	Mission	2.978261	1.6799	1.93	0.053	0.9858	8.99695
	Home	0.6514946	0.1917	-1.46	0.145	0.3659	1.15993
Cost of care	Free	Ref					
	Ksh 1-100	1.495533	0. 3664	1.64	0.101	0.9251	2.41761
	Ksh 101-500	2.788664	0. 9326	3.07	**0.002**	1.4477	5.37137
	Ksh >501	6.537063	2.4523	5.00	**0.000**	3.1336	13.6368
Knowledge of services	High	2.230769	0. 6721	2.66	**0.008**	1.2358	4.02656
	Average	2.100821	0.5781	2.70	**0.007**	1.2250	3.60261
	Poor	Ref					
Quality of services	Poor	Ref					
	Average	3.9941753	0.9414	5.74	**0.000**	2.4683	6.29476
	Good	5.260799	1.5618	5.59	**0.000**	2.9400	9.41345
Attitude	Positive	3.650794	0.8853161	5.34	**0.000**	2.2697	5.87223
	Negative	Ref					

19% [17]. While in Congo, only 34.6% of postnatal women had attended PNC within 42 days following childbirth [18]. Timing of the PNC visit is also very important and in this study, only 26% attended clinic within two weeks. This is similar to a study done in Uganda that reported 15.4%post-natal care within a week [6].

4.2 Determinants PNC Utilization

The study revealed maternal and spouse education had a profound effect on PNC services. College and secondary education respondents were more likely to utilize PNC services than primary category. Titaley et al., in Indonesia, observed similar finding [8]. Several prepositions may be attributed to this finding. Women, who are highly educated have increased access to medical information and generally capacitated to make decisions or choices regarding their health seeking behaviours. Indeed, according to a study conducted in 2009, educated women are more likely to be financially independent; enjoy more autonomy within and outside the household and greater confidence to make decisions about their own and demand health care services [19]. Educated women are also likely to have improved knowledge and information on modern medical treatment and have greater capacity to recognize specific illness [20]. The finding on spouse education chimes with Awusi et al., who reported that respondents married to spouse with college education were likely to utilize PNC services [21].

Employment status was another PNC determinant and those in self-employment were

65% less likely to utilize the services than those in formal engagements. Qualitative finding attributed to opportunity loss when mothers take time off from their daily work to attend clinic. Conventionally, employment is synonymous with empowerment, which may affect family's wealth status that in turn motivates health services utilization. Wealth status was found to be a predictor of utilization of services with respondents from lower and middle class being less likely to be utilizers than those in the highest wealth status. These findings are consistent with findings by Wang et al., and Izudi et al., who reported that women from richer households were more likely to access postnatal care [22,6]. Other demographic factors such as woman's marital status, religion and parity status were not associated with utilization of PNC services contrary to other studies [23,24].

Mode of transport was predictor of utilization of PNC services. Those who used private means were more likely to be utilizers than those who used public transport; while those who walked were less likely to utilize service compared to those who used public transport. Mode of transport is influenced by wealth and education status; as those with higher levels of education are more likely to have finances for transport. In the study, area transport infrastructure is good and this may be an enabler to utilization of services.

4.3 Health Systems Factors Associated with PNC Utilization

The study found that, distance to the health facility does not deter utilization; this can be attributed to the good road network found in the study area and thus there is ease of movement. This finding contrasts with other studies that documented distance to the health facility to be a barrier to uptake of services [24,25]. Perceived quality of services was found to be predictive of PNC utilization with bias for good services. Respondents who rated services as good were 52% more likely to utilize the services compared to those who rated services as poor. This is in tandem with other studies [25,26,27] which highlighted that promptness of care, competence of health workers, desire for privacy, perceived availability of equipment, friendliness of staff were all determinants of utilization of health services. Gbrysch & Campbell, observed that where people have the choice between several facilities, they sometimes travel further if the target facility is perceived to offer superior quality care [28]. They further reported that even where facilities are conveniently located, they are underused if their quality is considered poor**.** This was found to compare well with this study as findings from the FGDs showed that many women from the area travel to a certain hospital that was reported to offer very good services. Cost of care did not deter the mothers from seeking care and in this study; those who paid for services were more likely to utilize PNC services than those who had free services. This is important in our set up since maternity services are free but the mothers seem to have focused more on quality.

From this, study it evident that the mothers experienced some form of disrespectful care; this is consistent with other studies in Kenya that reported undignified care [29]. Disrespectful care has been documented as a key barrier to uptake of services as noted by Bowser et al. [30].

Only 15 % of the women had been informed about the PNC services and the benefits; meaning that many HCWs did not inform the mothers about PNC services. Similar findings have been documented elsewhere by Titaley et al., who reported that even for women who delivered at health facility they reported that they did not receive appointments for the services on discharge and were therefore not aware of them [8]. The higher utilization of PNC services by women who had delivered in a private and faith-based hospital is attributed to more resources in these facilities and therefore are more likely to provide individualized care to their patients. These findings are similar to studies reported elsewhere by Izudi et al. [6]. Gbrysch, and Campbell [28]. Quality may have featured prominently in this study because of the high educational level; about 73%, the respondents had secondary school education and above compared to the national level of 43% [10]. It has been documented that people with more education are aware of their rights and demand quality services [8,21].

4.4 Knowledge and Attitude in Regards to PNC Utilization

Knowledge of services was found to predict utilization; with those who rated PNC knowledge as poor, being less utilizers. During the FGDs, it was evident that there was confusion about the frequency and components of PNC services among the women in the study population that could undermine prompt care seeking for mother

and the baby. Low utilization of PNC services has been related to women's lack of knowledge about its importance and their lack of perceived need especially if they are feeling well [31]. The majority of the mothers were aware of PNC services but they did not know when they should seek those services. From the results of this study, it can be concluded that mothers' awareness about PNC service is more focused on the vaccination component than others.

Attitude towards care was also a predictor to services use; those with a positive attitude were more likely to utilize PNC services than those who with negative attitude. The fact that postnatal care was perceived to be unnecessary by women who did not feel sick demonstrates that these women do not recognize the importance of postnatal care for preventive health care. Dhaher et al., reported that the most frequent reason for not obtaining PNC services was that women did not feel sick and therefore did not need PNC services [19]. This has also been reported in other studies. Warren et al., noted that women perceive PNC services as source for children vaccinations and therefore wait to attend clinic only when vaccinations are due [32]. Women might ignore some of the negative health outcomes that can occur during the puerperium which may not be noticed early or initial signs; therefore, World Health Organization recommends postnatal care for all women and infants, including those who do not perceive any problems, for the purpose of general assessment of both physical and mental well-being [2]. There was perception that only women and neonates with health problems need to make efforts to receive postnatal care.

5. CONCLUSION

Uptake of postnatal care services as strategy to mitigate complication in both mother and child remains a task. The discourse is overtly hindered by place of delivery, quality of services, mode of transport and PNC level of awareness. Attitude and providers respective care practices were covert predictors. Timing of first post- delivery visit (second PNC services) varies but average was at or after 6 weeks.

6. RECOMMENDATIONS

In order to accrue the full benefit of the PNC services, quality and client oriented services is central. In this regard, training of health workers on responsive and respective care is paramount. To overcome informational barriers, there is need to increase the women's understanding and awareness of the importance of postnatal care services. At antenatal care, the health care workers need to inform the clients about PNC services and schedule appointments. Quality of services was wanting in facilities, research exploring the underlying course is necessary.

7. LIMITATION

This was self-reporting therefore it was assumed the respondents' were truthful when answering the questions. Nonetheless, mixed method approach was applied as mitigation.

CONSENT

During consenting process, the respondents acknowledged and counter signed a form approving their participation in the study and the use of the findings for public good.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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