

Health Facility Factors By Hospital Level That Make Women Who Attended ANC Make A Decision Not To Deliver In The Health Facilities In Kakamega Central Sub-County.

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Abstract: Despite a large proportion of woman attending ANC during pregnancy, a significant percentage still avoid delivering at the health facility. Thus increasing the risk of adverse pregnancy outcomes and death. Knowledge of factors associated with the decision against health facility delivery is limited.

Objective: To assess health facility factors by hospital level that made women who attended ANC make a decision not to deliver in the health facilities in Kakamega central sub-county, Kenya.

Design: A community based cross sectional study was undertaken focused on a structured interview method in collecting quantitative data. Sample of 332 women who attended ANC but did not deliver in a health facility. A multistage random sampling method was applied in the selection of a primary data.

Outcomes: Factors that made mothers to decide against health facility delivery despite ANC attendance included costs of transport and lunch, lack of supplies and commodities and lack of sufficient preparatory service for delivery. The statistical significance level was set at $p < 0.05$. Among farmers, 23.1% reported that did not always get enough staff compared to 36.% of business women and 38.2% who also mentioned that staff were not always available. We found significant associations between costs, and other costs. .

Keywords: Health facility delivery, skilled birth attendants, Reproductive age, Maternal health, Utilisation and Barriers

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I. Introduction

Improving maternal health indicators is one of the UN Millennium Development Goals and sustainable development goal. Current maternal mortality ratios in Kenya as high as 560 deaths per 100,000 live births WHO (2008). With a functioning health care system, most maternal deaths are avoidable if complications were identified early. A measure of the proportion of deliveries assisted by skilled attendants was one of the indicators of progress towards achieving Millennium Development Goal (MDG5), which aimed at improving maternal health. In Kenya, Western Rural area, usage of the ANC was high, but the opportunity to deliver in a health services was not fully utilized. Use of professional delivery services is low, and almost 1 out of 5 women delivered unassisted KDHS (2009).

Globally, one third of births took place at home without the assistance of a skilled attendant. In Africa, less than 50% of births were attended by a skilled health worker despite an increase from 43% to 57% between 1990 and 2005 in all developing regions. Consequently, two million women had died in Africa during childbirth since 2000. Each year, approximately 536,000 women died from complications related to pregnancy and childbirth, with 99% of these deaths occurring in Africa and Asia. Slightly more than half of these deaths (270 000) occurred in sub-Saharan Africa. To make the achievement of the fifth Millennium Development Goal (MDG) a reality, Maternal Mortality Rates (MMR) would have to decrease at a much faster rate especially in sub-Saharan Africa, where the annual decline had so far been about 0.1%. Most maternal deaths occurred during labor, delivery and the immediate postpartum period. Obstetric hemorrhage was the main direct cause accounting for 25% of maternal deaths, infections (15%), unsafe abortion (13%), eclampsia (12%), and obstructed labor (8%). Majority of maternal deaths in Kenya were due to obstetric complications that could have been prevented with adequate medical care during and after delivery. There were clear strategies and specified interventions for the reduction of maternal morbidity and mortality, often referred to as the Pillars of Safe Motherhood. These included: safe delivery, antenatal care, postnatal care and family planning. Safe delivery ensures that all deliveries were attended by persons with the right knowledge, skills and equipment and also provide post-partum care to mother and baby. These requirements could only be found in a health facility.

II. Literature review

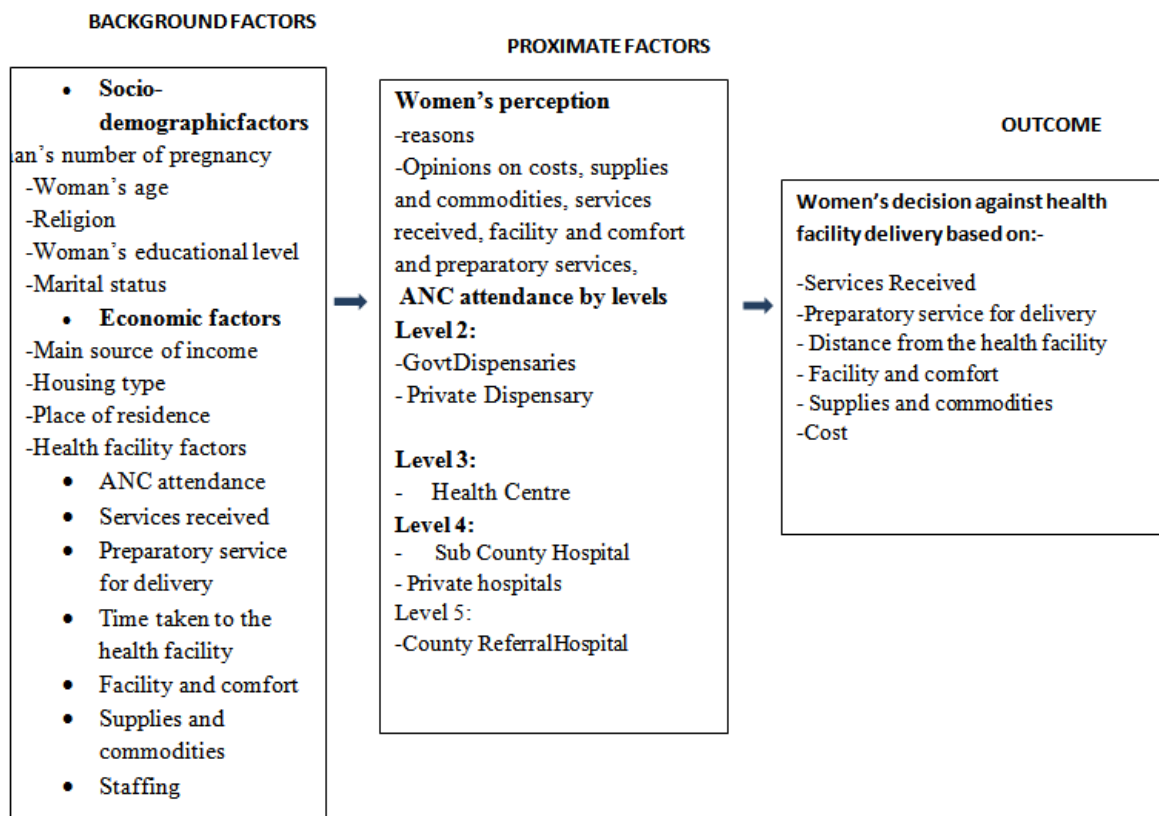
According to a study Accessibility and utilisation of delivery care within a Skilled Care Initiative in rural Burkina Faso by Hounton et al (2002), it was found out that there were 81 536 births in the two districts between 2002 and 2005, 31 345 (38.4%) of which took place in a health facility. Nearly, all (95%) institutional births were in a health centre. The median number of health workers per 10 000 population was 3.3 (range 0.7–19.7). Excluding trained traditional birth attendants, the median number was 3.1 (range 0.7–14.0). There was a strong association between the number of health workers in a health centre and the proportion of institutional births in the health centre's catchment area. Less than a third (29.0%) of births associated with health centres having two or fewer health workers per 10 000 population were institutional, compared to about half (54.2%) for the health centres with more than six health workers per 10 000 population (unadjusted *P*-value for linear trend <0.001). Physical inputs into health centres were not associated with institutional birth rates (*P* = 0.365). According to the study in Tanzania by Mrisho et al (2007) among the reasons given by the mothers for the choice of delivery place were; perceived comfort in the particular place (23.2%), distance to the health facility (18.3%), and type of antenatal care given in a health facility (16.6%). Based on all variables, 22.1% (79) of the respondent mothers were satisfied with health facility delivery services while 77.9% (279) were not. Mothers who perceived unskilled birth attendants as similar 61.3% (68) to the trained health care workers, in attending to deliveries were approximately 4 times more likely to be attended to unskilled birth attendants compared to those who acknowledged there was a difference in delivery attendance (OR 3.9, 95% CI 2.4-6.3, *P* < 0.001). A study in Nyandarua south District, Kenya by Wanjira et al (2011) found out that facility use for the previous delivery and ANC use were also nearly always highly predictive of health facility use for the index delivery, however, this would have been due to confounding by service availability and other unmeasured factors which influence prior service use. Similarly, the strong differentials in skilled attendance usually observed between rural and urban areas and between different regions are probably due to differences in infrastructure, health care quality, social, economic and cultural factors that are not accounted for. Wanjira et al (2011) found out that quality of health services was identified as an important determinant of care-seeking by numerous qualitative studies; however it had rarely been included in quantitative analyses. This was partly due to a lack of variation in health care quality in small-scale studies covering few facilities and partly due to a lack of such supply-side facility data in large household surveys like the DHS. Gathering quality of care data from household respondents can lead to "courtesy bias" and bias due to unequal knowledge on quality between women who have given birth in a facility and women who have not. Women could not be expected to report on the technical quality of care. Therefore it was recommended that the design of future surveys enables facility-level data on the quality of care to be linked to individual-level data on care-seeking behavior."

Kenya Demographic And Health Survey 2008-09 found out that very few women said they did not deliver in a facility because there were no female providers at the facility, it was not customary, their husband or family did not allow it, quality of service was poor, or the facility was not open. Differences by age at birth, birth order, and number of antenatal care visits are not major, although women with more antenatal visits are more likely than those with no antenatal care to say they did not deliver in a facility because of an abrupt delivery. As expected, women in rural areas are more likely than those in urban areas to say they did not deliver in a health facility because it was too far or they lacked transport. Women in Nairobi who did not deliver in a facility were more likely to cite high cost as a factor than are women in other provinces. Women in North Eastern province are far less likely to cite cost as a factor, but they were far more likely than women in other provinces to say they did not deliver in a facility because of poor quality of service and distance from a facility. Abrupt deliveries are a more important factor in not having facility-based deliveries for more educated and wealthier women than they are for those with less education and wealth.(122). According to S.Scott et al (2013) maternal mortality was 320 per 100 000 births (95% CI: 290, 353) in Indonesia and 318 per 100 000 (95% CI: 272, 369) in Bangladesh. Women who lived further from health centres in both countries were less likely to have their births attended by health professionals than those who lived closer. For women who were assisted by a health professional, the odds of dying increased with increasing distance from a health centre [odds ratio per km; Indonesia: 1.07 (95% CI: 1.02–1.11), Bangladesh: 1.47 (95% CI: 1.22–1.78)]. There was no evidence for an association between distance to a health centre and maternal death for women who were not assisted by a health professional. Gabrys et al (2009) found out in their study, the distance to the maternity hospital as having a causal role for place of delivery. Long distance from the maternity hospital was found to be significantly associated with home delivery and a linear trend could be seen. As they had, somehow, three distinct population from Kathmandu municipality, Kathmandu VDCs and Dhading VDCs; effect of this classification as an effect modifier would be worth analysing. But a common classification of distance, at whatever level either 15 minutes, half an hour or 1 hour done, resulted in absence or low number of either home deliveries in Kathmandu municipality or hospital deliveries in Dhading VDCs. These results were seen though the extreme point of Dhading VDCs were only 5 hrs far, with median 2 hrs distance for whole study population. If we had chosen a study population which included persons from farther area, we expect that distance would have even greater

effect on place of delivery. In Kenya, the most significant predictors of choosing home delivery (an informal delivery setting) was the distance from the household to the nearest maternity bed. Le Bacq, et al (2002) reported that hospital delivery in Kasama, Zambia seemed generally to be possible only for mothers living within walking distance of that institution, and that a dose-response relationship between distance and maternal mortality existed. By inquiring about resources and stress, Yantzi, et al (2004) studied the impacts of the distance to the hospital on families with a child suffering from a chronic medical condition. They reported that the families who had to travel more than 80 km to the hospital were 194% more likely to be negatively impacted by the hospitalisation compared to families who lived less than 80 km from the hospital. Noorali, et al (2007), chose the distance in kilometres rather than travel time as an indicator of physical accessibility. The reason given was the subjectivity involved in measuring travel time, particularly in a rural area where the mothers were not accustomed to using watches. In this study, they chose travel time instead of distance in kilometres to define the physical distance as they thought this as a more relevant way of measuring distance. They enquired about both the transport time on foot and when using various forms of transportation, and summed up later to define the physical distance. In cases of infant delivery, the actual time needed to travel was more crucial than the distance in kilometres. According to Moisi et al (2011) it was found out that in rural setting with a low density of health facility, physical access to source of care was a known determinant of health care utilization, with substantial decreases in rate of clinic attendance observed with increasing distance from homestead to the clinic this phenomena was termed “distance decay”. In Kilifi District in Kenya, we found no effect of distance to hospital or vaccine clinic on child mortality. Wanjira et al (2011) stated that similarly, a lack of good geographical data linked to household data hampers the investigation of the role of distance and potential interactions of distance with other factors despite wide acknowledgement of the importance to take service availability into account. Where distance data were gathered, mostly through community questionnaires, they were often restricted to the respondents' immediate surroundings and to the nearest facility of any kind – which was not necessarily one that offered delivery services. Nevertheless, the vast majority of studies investigating the role of distance found it to be a strong deterrent of delivery service use.

A study done in in Kilifi district, Kenya Moisi et al (2010) in there study, they used geographic information system methods to estimate pedestrian and vehicular travel time to the main referral hospital in Kilifi district and examined the relationship between travel time, hospital attendance and disease severity in children less than 5 years of age. In a similar study in rural Nigeria Stock et al. observed a distance decay gradient of 9% per kilometre for inpatient care, which equates to 24% per hour of walking off roads or 45% per hour on roads using our impedance assumptions. This gradient was steeper than the 21% decrease obtained in our pedestrian model, which suggested that children in Kilifi travel farther to access inpatient care. Maternal education was also a key determinant of distance decay -level socioeconomic data were required to examine possible interactions increasing education and disappeared in the areas with the highest maternal education levels. Travel time and socioeconomic factors that influenced care-seeking behavior, including the effect of wealth on mode of transport choice. Such data were not currently available for our study area, justifying their use of sub-location level maternal education variables as the best available proxy: this was an important limitation in a setting where household finances were likely to be a key determinant of access to hospital care. Kenya Demographic And Health Survey 2008-09 Women whose most recent birth in the five years before the survey did not occur in a health facility were asked why they did not deliver in a facility. the main reasons given for not delivering in a health facility were that it was too far away or that there was no transport to get to the facility, or both (42 percent) and that it was not necessary (21 percent). Also cited frequently are that the delivery occurred too fast to get to a facility (18 percent) and that it cost too much to deliver in a facility (17 percent). According to Van Eijk(2006) et al in a study in rural Western Kenya, Most women (83%) delivered outside of a health facility. Of these, 80% delivered in their own house, 18% in the house of a TBA and 3% on their way to a health facility. The most frequent reason for not attending a health facility for delivery was lack of means of transport, in particular at night (49%).

Fig 1: Operational Framework



III. Methods

This was a community based cross-sectional study. The area of study was Kakamega Central sub county. All the two divisions namely Municipality division and Lurambi division were included in the study. The target Population comprised of mothers aged 15 to 49 years in Kakamega Central Sub County and who attended to ANC but had a home delivery in the 6 months preceding the survey. The sample size was calculated using the prevalence of home delivery in western Kenya was 73.3% as reported by the most recent demographic data available at the time of the study, KDHS (2008-2009). A structured questionnaire was used to obtain demographic data of the mothers. The sample size were women of reproductive age who had delivery in the past 6 months which is 302 were divided proportionately using probability proportional to size of the Total population. So the sample size was calculated using fisher's formula as follows:-

$$n = \frac{Z^2 Pq}{d^2}$$

n = minimum sample size required

Z = Constant for two side 1.96 for 95%

d = absolute precision 0.05 (5%)

P = 0.73

q = 0.27

$$n = \frac{(1.96)^2 \times 0.73 \times 0.27}{(0.05)^2}$$

n = 302

10% was added to the minimum sample size to cater for non response.

In sampling technique, a multistage random sampling method was applied in the selection of a primary data; purposive sampling technique was used to select the division, Proportionate sampling technique was used to select the sub location and simple random sampling technique was used to select the villages and the household. Samples were selected in such a way that each mother in the population had a known (Nonzero) likelihood of being included in the study. Data collection was by use of structured questionnaires which were used for the interview. Women were asked for consent to be interviewed with assurance of non retribution for not participating. Those unwilling to participate were allowed to be excluded in the interview but no one refused.

The health facility based factors included Services Received, Preparatory service for delivery, Distance from the health facility, Facility and comfort, Supplies and commodities, Cost and staff availability and friendliness as per different level of hospitals. Satisfaction, practice and knowledge scores were generated by the researcher using different elements from the questionnaire each with 100 scores. The study Assumptions made was assumed that the information being given was true and not biased. Perspectives of the health care providers on how the services could be improved at the operational level in order to provide better guidelines for planners, administrators and policy makers. In data processing and analysis, Data captured in questionnaires was entered into Access database and cleaned. Data analysis was performed using Statistical Package for Social Sciences (SPSS). Analysis of home delivery practices among the 302 mothers was carried out using the most recent delivery report. Definition home delivery was considered to be one that was not at a health facility. Differences in proportions were compared using the Pearson's chi-square test for the categorical variables. A two-sided P-value < 0.05 was considered statistically significant. The independently were Services Received, Preparatory service for delivery, Distance from the health facility, Facility and comfort, Supplies and commodities with the dependable variable being home delivery. Bivariate analysis was conducted to assess association between the independent variables and the dependent variables. These factors included: services received, preparatory service for delivery, Distance from the health facility, Facility and comfort, Supplies and commodities, Cost and staff availability & friendliness levels of the health facility. The dependent variable was women's perception on health facility factors hindering health facility skilled delivery by levels of the health facility attended during ANC which was dichotomized as delivery in the level 2 coded as zero, level 3 coded 2, level 4 coded 3 and delivery at home was coded as one. The results are presented in form of tables and figures. Ethical considerations were; GLUK protocol proposal defense, Ethical review committee for approval. Approval to carry out the study was obtained from Kakamega central sub county Health Management Team. Only those mothers, who met the study requirements, verbally consented and voluntarily signed the consent forms were enrolled into the study. Participants who could not write indicated their consent by a fingerprint. All mothers were assured for confidentiality.

IV. Findings

In terms of preparatory service for delivery, Most of the interviewed mothers affirmed to have received preparatory service on where to delivery in all the health facilities. Private hospital were leading with 80%, level 5 and level 4 hospital and Private dispensary each followed by (76%). The same trend was seen on other preparatory service for delivery that is advise on place of delivery. A Chi Square test of independence conducted on the data showed that there was no significant association between availability of advice on where to deliver and birth plan and level of the health facility. In analyzing facilities and Comfort, mothers interviewed, generally indicated that the different level of health facilities which they attended their ANC services were comfortable in terms of adequate space, privacy, cleanliness, well maintained grounds and flowers, correctly directed for services during ANC visits and waiting time. Comparably, private hospital and private dispensaries had the highest percentage followed by the county and sub county hospitals and lastly the government health centres and government dispensaries. However a Chi Square test of independence conducted on the data showed that there was no significant (P=0.380.) association between availability of comfort and level of health facilities. About Supplies and commodities, most of the interviewed mothers (66%) affirmed to have always receive supplies and commodities they required or that had been prescribed during the ANC visits in all the health facilities. Private hospital were leading with 90%, then level 5 hospital. A Chi Square test of independence conducted on the data showed that there was no significant (P=0.999). Association between level of health facilities and supplies and commodities. The supplies that were missing mostly were ferrous and folic acid and dewormers. In responses on missing supplies and commodities, most of the interviewed mothers (66%) affirmed to have always receive supplies and commodities they required or that had been prescribed during the ANC visits in all the health facilities though there were some supplies and commodities missed especially in government health facilities. A Chi Square test of independence conducted on the data showed that there was significant (P=0.038) association between level of health facilities and missing of supplies commodities. In relation to the cost for any services, Most mothers interviewed cited that costs incurred during ANC visit affected their decision against health facility delivery especially in private hospital at 90%. A Chi Square test of

independence conducted on the data showed that there was no significant ($P > 0.05$), association between level of health facilities and cost of services ($\chi^2_{2,0.05} = 3.003$). However other costs like transport, lunch and others affected greatly mothers' decision against hospital delivery. A Chi Square test of independence conducted on the data showed that there was a significant ($P = 0.0063$) association between level of health facilities and availability of other costs. In terms of staff availability, A Chi Square test of independence conducted on the data showed that there was no significant ($P = 0.867$), association between level of health facilities and getting of all staffs needed. Majority of the respondents got all staffs that they needed to see during all there ANC visits. However in all health facilities, the respondent missed being attended to by the doctors of their liking which was (43%). A Chi Square test of independence conducted on the data showed that there was no significant ($P = 0.0605$) association between level of health facilities and staffs often missed. In Responses on availability of all staffs needed to be seen during all ANC visits, Most of the interviewed mothers cited that the non-availability of staff and unfriendliness affected their decision against health facility delivery. Most affected the private hospital at 80% and private dispensaries at 78%. A Chi Square test of independence conducted on the data showed that there was no significant ($P = 0.281$) association between medical facilities and staff who served you most of the time. About time taken to the health facility of your ANC services, most of the mothers interviewed stated that they use (31mins – 1 hour) to reach the facility of their ANC service. The facilities that seem to be far Away were the government health Centre whereby (54%) of those mothers interviewed took more than one hour to reach the health Centre. The private hospitals seems to be the most easily accessed whereby (40%) of the mothers interviewed spent less than 10mins to reach the health facility. Most mothers interviewed cited to use motorbikes as a major means of transport to their health facility. A Chi Square test of independence conducted on the data showed that there was no significant ($P = 0.517$) association between level of health facilities and Time taken to the health facility of your ANC services.

Table 1: Association between health facility factors and health facility level

	Level 5:	Level 4: Public	Level 4: Private	Level 3: Govt Health Centres	Level 2: Govt Dispensaries	Level 2: private Dispensaries	P-Value
N=302	N=166 (%)	N=49 (%)	N=17 (%)	N=23 (%)	N=36 (%)	N=11 (%)	
1. Preparatory service for health delivery							
a. Advice on birth plan	111(67) 55(33)	65(32) 35(17)	12(70) 5(30)	58(13) 42(10)	59(21) 51(15)	30(8) 70(3)	0.827
b. Advise on where to deliver	126(76) 40(24)	78(38) 22(11)	80(14) 20(3)	70(16) 30(7)	76(27) 24 (9)	78(9) 22(2)	0.427
2. Distance from the health facility							
• 0-10mins	42(14)	30(8)	40	6	12	18	0.517
• 11-30mins	39(18)	18	30	22	20	20	
• 31mins-1hour	109(36)	78(38)	42(10)	20	40	24	
• Over 1 hour	65(32)	36	20	52	28	38	

Table 2: Association between health facility factors and health facility level

	Level 5:	Level 4: Public	Level 4: Private	Level 3: Govt Health Centres	Level 2: Govt Dispensaries	Level 2: private Dispensaries	P-Value
N=302	N=166 (%)	N=49 (%)	N=17 (%)	N=23 (%)	N=36 (%)	N=11 (%)	
3. Facility and comfort							
• Adequate space							0.380
Yes	87	86	88	81	79	90	
No	13	14	12	19	21	10	
• Privacy							
Yes	82	86	90	76	76	92	
No	18	14	10	24	24	8	

Health Facility Factors By Hospital Level That Make Women Who Attended Anc Make A Decision

•	Cleanliness						
Yes		79	80	90	60	64	90
No		21	20	10	40	36	10
•	Maintained grounds						
Yes		70	67	92	55	59	90
No		30	33	8	45	41	10
•	Correct directions						
Yes		85	78	80	76	78	85
No		15	22	20	24	22	15
•	Waiting time						
Yes		58	67	60	40	42	60
No		42	33	40	60	58	40

Table 3: Association between health facility factors and health facility level

Health facility factors		Level 5:	Level 4: Public	Level 4: Private Hospital	Level 3: Govt Health Centres	Level 2: Govt Dispensaries	Level 2: private Dispensaries	P-Value
4.	Supplies and commodities							
a.	Received supplies and commodities	64	61	66	58	54	64	0.804
•	Yes	36	39	34	42	46	36	
•	No							
b.	Missing supplies (n=186)	17	12	6	15	20	0	0.038
•	Motherchild booklet	18	17	20	20	20	10	
•	Tetanus injection	15	20	30	12	0	13	
•	Lab reagents	25	33	10	30	30	4	
•	Mosquito nets	30	20	6	20	20	12	
•	Malaria drugs	21	22	10	20	30	5	
•	Iron Follic tablets	26	23	2	29	30	6	
•	Dewormers							
5.	Cost							0.557
a.	Costs incurred	52	62	100	54	52	90	
•	Yes	48	38	0	46	48	10	0.006
•	No							
b.	Other costs	52	54	70	52	51	60	
•	Transport,	24	26	10	26	26	30	
•	Lunch	24	20	20	22	23	10	0.867
•	Others	68	66	80	60	56	78	
6.	Staff availability and friendliness	32	34	20	40	44	22	
a.	Staff availability							
•	Yes							
•	No							

Opinion on delivery cost

Most mothers interviewed cited that the cost of delivery of delivery was affordable(46%)140,. None said that it was affordable 00(00.0%)

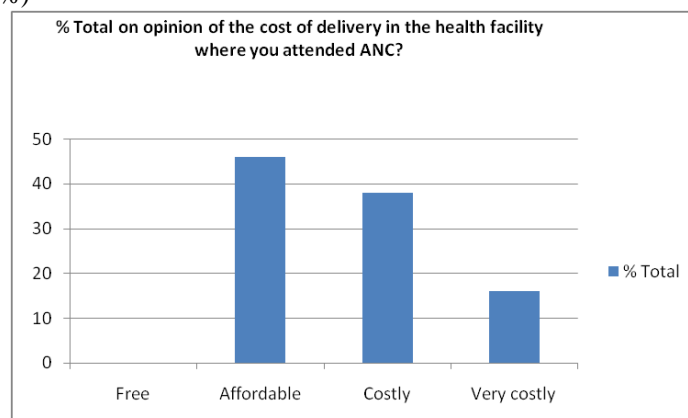


Figure 2: Responses ranking of choices by element of cost

V. Conclusion and recommendation

Availability of different levels of health facility will not alone solve the problem of low health facility delivery rates. These facilities need to be equally empowered with supplies, staffs who can give quality comprehensive service. Furthermore the women need to be economically empowered to be able to meet other costs like transport and lunch. Focus on increasing financing for maternity service by the government and intersectoral approach for maternal health is crucial in Kakamega Central Sub County. The county government decentralization of delivery services in all health facilities and provide with staffs, supplies and commodities for equity of usage of delivery services, improved road network. Need for constructive and collaborative approach to promote maternal health and need to multi-sectoral approach to overcoming the barriers to health facility deliveries.

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