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DETERMINANTS OF UTILIZATION OF MATERNAL HEALTH CARE SERVICES IN TANA RIVER COUNTY, KENYA

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Determinants of Utilization of Maternal Health Care Services in Tana River County, Kenya

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ABSTRACT

Purpose: The main purpose of this study was to determine factors influencing utilization of delivery services by Women of Reproductive age in Tana River County

Methodology: The study was cross-sectional in design. The target population included all women of reproductive age (14-49 years) in Kipini location. The study population consisted of women of reproductive age who had delivered. A structured questionnaire was used as the primary instrument of data collection during interviews of the consenting women of reproductive age. The sampling techniques used involved a combination of cluster sampling, proportionate, systematic sampling and simple random sampling. Data analysis was done using the SPSS. Authorization from the Kenya Methodist University ethical committee was sought prior to data collection

Findings: A total of 335 (95.7%) questionnaires were filled and returned. Majority of the respondents were married, with a primary level of education, occupation being farmers. Majority of the women had their last delivery in a hospitals (80%), with most of the delivery happened in private facilities (77.6%). From the findings, cultural and cost factors had a negative relationship to the utilization of delivery services by women of the reproductive age. However, access and socio-demographic factors had a positive and significant relationship to the utilization of delivery services by women of the reproductive in Tana River County.

Unique Contribution to Theory, Practice and Policy recommendation: The study recommended skilled attendants to allow some safe cultural and religious practices during delivery so as to encourage the utilization of delivery services. It also recommended that the county government enforce the free maternity policies by making sure that no hidden or additional fee is charged to the women during delivery. The government should increase the number of permanent and mobile health facilities In Tana River County so that every women (including nomadic population) to have access to delivery services

Keywords: *Determinants of service delivery, Culture, Cost, Access and Demographics*

1.0 INTRODUCTION

Maternal mortality has been identified as a worldwide health concern twenty during the launch of the international Safe Motherhood Initiative. There are 536,000 global deaths of women associated with obstetric related causes (World Health Organization, 2007). According to United Nations (2007) the Millennium Development Goal 5 aimed to reduce the maternal mortality ratio by 75% from 1990 to 2015 by increasing the proportion of skilled deliveries.

The most common cause of maternal mortality in India is hemorrhage (38%) followed by sepsis (11%) and obstructed labor (5%). These deaths are prevented by utilization of maternal health services (Kesterton, Cleland & Slogget, 2010). However, utilization of these services is affected by many factors which should be well understood (Pallikadavath & Foss, 2004). Skilled attendance during childbirth is very important factor for the reduction of MMR (WHO, 2004). Neonatal and Maternal mortality can be significantly reduced by community-based interventions (Lassi, Haider & Bhutta, 2010). Antony et al (2013) reported a lower MMR of 10 per 100,000 live births in the developed world compared to more than 500 in the third world countries. Sub-Saharan Africa also reported 175 higher risk of maternal mortality than in the developing world.

There is paucity of data on the effects of women on the access of delivery services in developing countries. The institutional delivery by skilled attendants was noted to be a strong factor in meeting the MDG 5 goal. According to WHO (2005) obstructed labor, hemorrhage, unsafe abortions, sepsis, and hypertensive disorder of pregnancy contributes to 80% of the global maternal deaths. Institutional delivery and use of antenatal care can significantly reduce these deaths. According Freedman et al (2003) reported that high MMR is shameful to the human race. Factors affecting the use of maternal services operate at individual, household and community level. The determinants vary based on the specific indicator of maternal services. The demand for maternal services is affected by several factors which are not in the control of the pregnant women such as accessibility of the facilities, overall cost of services, staff competence and cultural sensitivity, and the availability of essential commodities in the facilities (Lashman, 2006).

2.0 LITERATURE REVIEW

Utilization of delivery services

In Kenya, MMR was reported at 488 deaths per 100 000 births (KDHS, 2008/9). Most of African countries have few of the births occurring in the hospitals by Skilled Attendants. The KDHS observed that rural deliveries are twice more likely to be at home than urban children. The Kenyan average for institutional deliveries is 40%. There are 281,500 maternal deaths worldwide annually: 99% of which occur in the third world and most of them are preventable. According to Boerma & Mati (2007) effective interventions with consideration on women culture and perception with improve on the use of the maternal services. Factors affecting the use of delivery services are caused by a several factors such as educational level, awareness of the importance of maternal care, accessibility and socioeconomic factors.

A study in Kibera slums found a higher percentage (43.9%) of hospital delivery occurring in public hospitals than in private hospitals. The difference can be explained by the free maternity services in the public hospitals more preferable by women in the slum area. Majority of the women in the rural Kenya still find the cost of maternal services in public health facilities to be high due to

uneven implementation of the free maternal services policy in the county (Chuma, Musimbi, Okungu, Goodman, & Molyneux, 2009). Free maternity services in public hospitals were introduced in Kenya in 2003. The policy was aimed at increasing hospital and skilled deliveries in the country. Despite the free maternal health services policies, a high percentage of women still deliver at home (Ngesa, Kirui, Matheka, Otieno, & Yoos, 2021).

Women underutilize delivery services because of their cultural belief, low socioeconomic status and low levels of literacy. Health problems afflicting people is attributed to superstitions and evil spirits (Raju, 2000). The formal health care systems are sought only when the traditional fail or unsatisfactory. To appease their evil spirits, some pregnant women seek traditional care first before the formal care systems. These informal systems delay initiation of care and negatively affect care in the formal systems. The use of maternal and general health care services is adversely affected by the cultural practices and beliefs of the population. It has also been identified that traditional birth attendants and husband interference affect the use of maternal services. Majority of the rural women believe that delivering at home by the traditional attendants is of high quality and in line with the local norms. For this reason, the prevalence of home deliveries by such women is very high due to cultural influences at individual and community level (Stephenson and Matthews, 2004).

Adjiwanou & Legrand (2013) many women in sub-Saharan Africa seek traditional care for maternal services. Use of traditional medicine for maternal health services pose a challenge for government and non-governmental organizations efforts in the addressing the issue of maternal mortality. Traditional birth attendants are the main providers of obstetric services for women seeking care in rural Ghana. Availability of TBAs contributed significantly for women's nonuse of maternal services (Esema & Sapor, 2013). A study by Sarin (1997) also concluded that health services use is affected by cultural, economic and quality of the services.

A study in Ethiopia by Ahmed, Demissie, Worku, Abrha & Berhane (2019) reported that cultural factors affecting the utilization of delivery services include: decision making power of women, lack of independence, trust in TBAs, religious practices, traditional practices and household chores. Another study in Ethiopia by concluded that TBAs had a positive effect in the utilization of maternal services (Ababor et al., 2019). A study in western Kenya reported that majority of the women prefer home deliveries due to high control over their bodies (Olungah, 2006). A study in Pakistan reported that women of reproductive age prefer to be assisted by TBAs during delivery (Omer, Zakar, Zakar, & Fischer, 2021).

The Kenyan Government on 1st June, 2013, introduced a policy to abolish maternity charges in all public hospitals. The service fee in public hospitals was established in the 1980s to supplement Government allocations to health facilities. The free maternity services are expected to encourage mothers to utilize delivery services at health facilities and to reduce maternal deaths (Maternal Newborn Health Care-Kenya, 2013). Evidence has shown that user fees constitute an impediment to delivery utilization among the underprivileged populations. There is a trade-off between the quality and increasing the use of services in the hospitals (WHO, 2008). According to Akashi et al. (2004) noted are drop of quality associated with the high volumes of patients due to free services.

According to WHO (2008) reported that there is no risk sharing in the payment of user fees. It entails payment for commodities, consultation and the cost drugs. 76.9% of Tana River Population lives in absolute Poverty (Tana River CIDP, 2014). According to UNFPA (2006) that low socioeconomic status negatively affects health of the people. Women with low socioeconomic could not afford services hence are at higher risks of morbidity and mortality. Orphans are also more prone to ill health. According Stephenson & Tsui (2002) concluded that socio economic factors and service delivery environment affect the use of maternal services. In a study by Vora et al (2009) hospital delivery was reported to be 13% for low socio-economic status women compared to 84% of rich women.

Randive, Diwan & De costa (2013) observed a significant increase in institutional delivery since the launch of cash transfer scheme. Lassi, Haider & Bhutta (2010) noted a significant decrease in neonatal and maternal morbidity and mortality with community-based interventions. Saha, Anmear & Oathak in India reported a high use of maternal services and subsequent high new born survival rates in women with self-help groups. Free health policy was first introduced in the country in 1965. User fee was later introduced in 1988 due to pressure from the international community. Free maternal services were re-introduced in 2013 through the Ministry of Health (Chuma et al., 2013).

Women living within 5 kilometers from the hospital are more likely to deliver in the hospital than women living further away (Samson, 2012). Availability of medical supplies in the hospitals had a positive effect on the utilization of delivery services in the north eastern part of Kenya (Mohamed, 2020). Women living in urban areas and those living at a distance of less than 5km from a nearby health facility showed a significant association with delivery in a hospital by women of reproductive age (Alemi Kebede & Teklehaymanot, 2016).

A study in Papua New Guinea reported that rich women, those living in the islands region and working women had higher odds of utilizing delivery services by skilled attendants in the nearby hospital (Seidu et al., 2022). Distance to the nearby health facility was found to significantly affect the utilization of institutional delivery in northwest Ethiopia (Kidanu, Degu, & Tiruye, 2017). Health care related factors and socio-demographics were reported to significantly affecting the use of skilled delivery services in a Zambian population (Rashid, Chowdhury, Kader, Hiswåls, & Macassa, 2022).

A study by Samson (2012) and Alemi & Tekehaymot (2016) observed that majority of the women lived more than 5 km from a nearby facility which had a negative effect on utilization of delivery services. A study in north eastern Kenya by Mohamed (2020) also found that essential medical supplies were unavailable in their nearby facility most of the times which had a positive effect on utilization of delivery services. A study in Migori, Kenya reported that majority of the women noted access factors such as distance, availability of trained health workers influencing their utilization of delivery services (Cheptum et al., 2014). A study in Zambia by Rashid, Chowdhury, Kader, Hiswals & Macassa (2022) reported that distance of more than 5km from the nearby facility negatively affected utilization of delivery services.

A high level of education prevents the women from maternal related morbidity and mortality. Educated women have a better understanding of the risks involved of not using delivery services. They are less likely not to utilize maternal services as opposed to the uneducated ones. A study in

Uganda reported that increase in the level of education of women of reproductive age increases their chances of delivering in a health facility (Samson, 2012). The Adult Literacy rate in Tana River County is 33.7% with female Literacy rate at 27.6% while male literacy rate at 40.2% (CIDP, 2014). There is a strong positive effect on the women's literacy level and the use of maternal services (Ebuchi, Roberts & Inem, 2006). Chakraborty, Islam, Chowdhury, Bari & Akhtar (2003) reported that mother's education positively affects the use of antenatal care and delivery services by women of reproductive age.

Sing et al (2019) reported that an increase in women's age decrease the likelihood of institutional delivery. Chepkorir (2014) that the age of the mother influences the utilization of maternal services. A study in Rwanda by Manishimwa (2011) concluded that age of the mother, health insurance, education, income and living in urban areas had a positive effect to use of maternal services. Magadi et al (2000) also reported that utilization of maternal services is affected by maternal age.

Ebuchi, Roberts & Inem (2006) reported that maternal age positively affects the use of maternal services. Utilization of delivery and ANC services is significantly low for adolescent mothers (Aduragbemi, Thomas & Ameh, 2007). A study in Rwanda by Manishimwa (2011) reported that older, richer and more educated women have a higher knowledge and understanding of the importance of hospital delivery and delivery related complication than the younger, poorer and illiterate women. Magadi et al., (2000) reported that older and married women are more knowledgeable on the importance of utilization of maternal health services than the younger women.

3.0 METHODOLOGY

The study was cross-sectional in design. The target population included all women of reproductive age (14-49 years) in Kipini location. The study population consisted of women of reproductive age who had delivered. A structured questionnaire was used as the primary instrument of data collection during interviews of the consenting women of reproductive age. The sampling techniques used involved a combination of cluster sampling, proportionate, systematic sampling and simple random sampling. Data analysis was done using the SPSS. Authorization from the Kenya Methodist University ethical committee was sought prior to data collection

4.0 RESULTS AND DISCUSSION

4.1 Response Rate

A total of 350 questionnaires were given out which was equivalent to the sample size of the study. A total of 335 questionnaires were properly filled and returned as illustrated in Table 4.1 below.

Table 1: Response rate

Response Rate	Frequency	Percent
No. of Questionnaires sent out	350	100%
Questionnaires returned	335	95.7%
Questionnaires not returned	15	4.3%

Source: Survey Data (2022)

The study had a total of 335 questionnaires which were duly filled and returned representing 95.7% of the response rate. According to Mugenda and Mugenda (2003), a response rate of 50% is adequate for research studies. The response rate of this study was 95.7% and this implied that it was adequate.

4.2 Descriptive statistics

4.2.1 Demographic characteristics

Demographic information relating to the respondent's marital status, age, occupation of the women, occupation of the husband, level of education of the mother and the level of education of the husband was collected and results presented in the following sections.

4.2.2 Respondents' Marital Status

The marital status of the respondents was collected and findings were presented in Table 2 below.

Table 2 Marital status

	No.	%
Married	274	81.8
Single	35	10.4
Divorced/separated/Widowed	26	7.8
Total	335	100.0

From the findings in Table 2, married respondents were more at 81.8% compared to the single and divorced/ separated/ widowed respondents who were at 10.4% and 7.8% respectively. This implies that majority of the women in Kipini location were married. This also implies that majority of the women have their husbands to seek for financial support and support in decision making for utilization of delivery services.

4.2.3 Respondents' Age group

The age groups of the respondents were collected and findings were presented in Table 3 below.

Table 3: Respondents' Age group

	Frequency	Percent
Less than 20 years	140	41.8
21 to 30 years	136	40.6
31 to 39 years	48	14.3
Above 40 years	11	3.3

Majority of the women (41.8%) were aged less than 20 years. Women aged between 21 and 30 years were 40.6% and 14.3% were between 31 to 39 years. The least percentage of mothers at 3.3% was aged above 40 years. This implies that majority of the women had age below 20 years. Further, it shows that percentage of teen pregnancy in kipini location is high (41.8%). The high teen pregnancy also explained the low literacy levels in the county due to pregnancy associated school drop outs. Teenage mothers are less likely to be employed in the formal sectors.

The findings are higher than the KDHS (2014) which reported a 18% prevalence of teenage pregnancy in Kenya (Muturi, 2020). The findings are in agreement with a three months study in north eastern Kenya which reported a 40% increase in teenage pregnancy and teenage mothers. The increase was however attributed to lock down due to COVID- 19 pandemic (Partridge-Hicks, 2020).

The findings agree with the KDHS (2014) which reported the prevalence of teenage pregnancy in Tana River County was 25-40%. The high teenage pregnancy was attributed to low utilization of family planning services (2-34%) and low levels of literacy in the county.

4.2.4 Level of education of the mother

The level of education of the women was collected and findings were presented in Table 3 below.

Table 3: Level of education of the mother

	No.	%
Primary	171	51.0
Secondary	37	11.0
College/University	8	2.4
No formal education	119	35.5
Total	335	100.0

From the findings in Table 3, majority of the women (51%) had a primary level of education. Women with no level of education were 35.5% and 11% had secondary level of education. The least percentage of mothers at 2.4% had college/ university education. This implies that majority of the women had only primary level of education. Further, it shows that illiteracy level (35.5%) is high among women in Kipini ward.

The findings agree with the KDHS (2014) which reported a high literacy level (88%) of women of reproductive age in Kenya. However, Tana River County literacy levels for the WRA were reported between 58% and 74%. Tana River County low literacy levels can be attributed to the high teenage pregnancy and motherhood, high poverty levels and low coverage of schools in the county.

4.2.5 Level of education of the husband

The level of education of the respondents' husbands was collected and findings were presented in Table 4 below.

Table 4: Level of education of the husband

	No.	%
Primary	143	42.7
Secondary	58	17.3
College/University	7	2.1
No formal education	127	37.9
Total	335	100.0

From the findings in Table 4, majority of the husbands at 42.7% had a primary level of education. 37.9% of the husbands had no formal education whereas 17.3% of the husbands had secondary level of education. The least percentage of husbands at 2.1% had college/ university level of

education. This implies that majority of the respondents' husbands had primary level of education. Further, it implies that illiteracy levels are high among men in kipini ward.

The findings agree with the KDHS (2014) which reported 97% of men age 15-49 years is literate. However, the literacy levels of men age 15-49 was reported 70-74% in Tana River County. The low literacy levels amongst men in Tana River County can be attributed to the high poverty levels and low coverage of schools in the county.

4.2.6 Occupation of the woman

Occupation of the respondents was collected and the results were presented in Table 5 below.

Table 5 Occupation of the woman

	No.	%
Housewife	108	32.2
Farmer	140	41.8
Paid employee	6	1.8
Small business	81	24.2
Total	335	100.0

From the findings in Table 5, 32.2% of the respondents were housewives. 41.8% of the respondents were farmers whereas 1.8% of the respondents were in the formal sector. 24.2% of the respondents were in small businesses (tailor, business woman, student, casual laborer). This implies that the highest percentage of respondents were farmers whereas the lowest percentage of respondents were in the small business. Further, it implies that a high percentage of women (32.2%) were not involved in any income generating activities.

The findings agree with the Kenya National Bureau of Statistics (2019) which reported 62% overall employment in the country. The low employment levels in Tana River County can be attributed to the low literacy levels, high teen pregnancy and motherhood, and high poverty index.

4.2.7 Occupation of the husband

The occupation of the respondents' husbands was collected and the findings were presented in Table 6 below.

Table 6 Occupation of the husband

	No.	%
Househusband	172	51.3
Farmer	33	9.9
Paid employee	18	5.4
Small business	112	33.4
Total	335	100.0

From the results in Table 6, 51.3% of the husbands were househusbands. 9.9% of the husbands were farmers whereas 5.4% were in the formal sector. 33.4% of the husbands were in small businesses (tailor, business man, student, casual laborer). This implies that the highest percentage of husbands were househusbands whereas the lowest percentage of husbands were in the formal

sector. Further, it implies that majority of the men were not involved in any form of income generating activity.

The findings agree with the Kenya National Bureau of Statistics (2019) which reported 62% overall employment in the country. The low employment status in Tana River County can be attributed to the low literacy levels and high poverty index.

4.3 Influence of cultural factors

The study aimed at evaluating the influence of cultural factors on utilization of delivery services. The rates of the measures were assessed on the practice of measures.

Table 7: Cultural Factors

	Low extent %	Moderate extent %	Large extent %	Mean	Standard Deviation
I prefer to deliver at home	57.9%	26.3%	15.8%	1.2	.25
I prefer to be assisted in delivery by the culturally trained midwives	61.2%	24.5%	14.3%	1.3	.13
I prefer being attended to by a healthcare worker of a certain gender	65.7%	22.1%	12.2%	1.3	.20
I hold cultural delivery practices in high esteem	66.3%	19.4%	14.3%	1.3	.23
My culture emphasizes privacy during delivery	65.7%	18.8%	15.5%	1.3	.25
I believe that delivering in a health facility will deny me some cultural practices	64.2%	20.3%	15.5%	1.3	.25

The research study assessed the impact of preference of place of delivery on utilization of maternal services. Majority of the respondents at 57.9% do not prefer to deliver at home whereas 26.3% prefer to deliver at home to a moderate extent. The mean of the response was 1.2 and the standard deviation was 0.25. The findings disagree with a qualitative study in western Kenya which reported majority of the women preferring home deliveries due to high control over their bodies (Olungah, 2006). However, it agrees with the finding of this study that 80% of the women had their last delivery in a hospital.

The study aimed at evaluating impact of preference of being assisted by culturally trained midwives on utilization of maternal services. Majority of the respondents at 61.2% of the respondents did not prefer being assisted by culturally trained midwives whereas 24.5% preferred being assisted by culturally trained midwives to a moderate extent. The mean of the responses was 1.3 and the standard deviation was 0.13. The findings disagree with a study in Pakistan which reported women preferring to be attended by culturally trained attendants during delivery (Omer et al., 2021). The difference can be explained by the cultural differences between the two populations. The findings disagreed with a Kenyan study which observed a high preference of TBAs during delivery by women of reproductive age (Ochako et al., 2011). However, the later only included young women aged 15-24 years instead of WA.

The research evaluated the impact of preference of gender of healthcare worker on utilization. Majority of the respondents at 65.7% of the respondents had no preference of being attended to by a health worker of a certain gender. The mean of the responses was 1.3 and the standard deviation was 0.20. The findings disagreed with a qualitative study in western Kenya which reported majority of the women preferring female health workers during delivery (Olungah, 2006). The findings was also different from a north eastern Kenyan study which reported majority of the women preferring female attendants during delivery (Kisiangani et al., 2020). The findings also disagreed with a study in the coastal Kenya which found majority women prefer health attendant of a female gender during delivery (Mochache et al., 2020).

The research evaluated the impact of holding cultural delivery practices in high esteem on utilization. Majority of the respondents at 66.3% of the respondents do not hold cultural delivery practices in high esteem whereas only 14.3% hold delivery practices in high esteem to a high extent. The mean of the responses was 1.3 and the standard deviation was 0.23. The findings disagree with a study in Pakistan which reported women of reproductive age held cultural and religious factors in high esteem during delivery (Omer et al., 2021). The difference can be explained by cultural and religious differences between the 2 studies. The findings also disagreed with a qualitative study in western Kenya which reported majority of the women preferring female health workers during delivery (Olungah, 2006). The findings disagreed with a study in the coastal Kenya which found majority women held cultural factors in high esteem during delivery (Mochache et al., 2020).

The research evaluated the impact of culture emphasizing on privacy during delivery on utilization. Majority of the respondents at 65.7% of the respondents stated that their culture did not emphasize on privacy during delivery whereas only 15.5% stated their culture emphasizes on privacy during delivery to a high extent. The mean of the responses was 1.3 and the standard deviation was 0.25. The findings disagreed with a north eastern Kenyan study which reported majority of the women emphasized on privacy during delivery (Kisiangani et al., 2020). The findings disagreed with a study in the coastal Kenya which found women emphasized on privacy during delivery due to religious reasons (Mochache et al., 2020).

The research evaluated the impact of believing that delivering in a health facility will deny the women some cultural practices on utilization. Majority of the respondents at 64.2% of the respondents stated that they do not believe that delivering in a health facility will deny them some cultural practices whereas only 15.5% of the respondents stated that they believe that delivering in a health facility will deny them some cultural practices to a high extent. The mean of the responses was 1.3 and the standard deviation was 0.25.

The access to cultural practices delivery can be explained by the fact that majority of the women deliver in private hospitals (77.6%) where patients' responsiveness as a tool for patients attraction and retention strategy. Antenatal care clinic utilization in Tana River County is high were pregnant women get counseled on the importance of hospital/skilled delivery (County Integrated Development Plan, 2014).

4.5 Influence of cost on utilization

The study aimed at evaluating the influence of cost factors on utilization. The rates of the measures were assessed on the practice of measures.

Table 8: Cost Factors

	Low extent %	Moderate extent %	Large extent %	Mean	Total Standard Deviation
The consultation cost charged during delivery is too high for the women	75.2%	13.4%	11.3%	1.36	.18
The cost of laboratory services charged during hospital delivery is too high	71.9%	17.3%	10.7%	1.39	.17
The amount of money charged by the hospital for medicines during delivery is not acceptable	69.9%	20.9%	9.3%	1.39	.25
Women pay for consumables (such as cotton wool, basins, gloves etc.) during hospital delivery	73.4%	17.0%	9.6%	1.36	.15
The transport cost to the facility during delivery is very high	71.6%	14.3%	14.0%	1.42	.23
Additional cost paid to the health care worker during delivery is affordable	68.4%	19.1%	12.5%	1.44	.21
The cost paid to accompanying TBA during delivery is affordable	76.4%	12.5%	11.0%	1.35	.27
The amount charged for antenatal profile (laboratory tests during prenatal clinic) is too high	74.3%	14.6%	11.0%	1.37	.17

The research evaluated the impact of consultation cost charged during delivery and cost of laboratory services on utilization of delivery services. Majority of the respondents at 75.2% did not agree that the consultation cost charged during delivery is too high for the women whereas only 11.3% agreed to a high extent that the cost charged during delivery was too high. The mean of the responses was 1.36 and the standard deviation was 0.18. Majority of the respondents at 71.9% did not agree that the cost of laboratory services is too high. However, only 10.7% agreed to a high extent that the cost was too high. The mean of the responses was 1.39 and the standard deviation was 0.17. This implies that the cost of laboratory services during delivery is affordable in Tana River County.

The study also evaluated the impact of the amount of money charged by the hospital for medicines and women paying for consumables (such as cotton wool, basins, gloves etc.) during hospital delivery on utilization of delivery services. Majority of the respondents at 69.9% did not agree that the amount of money charged by the hospital for medicines during delivery is not acceptable. However, only 9.3% agreed to the statement to a great extent. The mean of the responses was 1.39 and the standard deviation was 0.25. This implies that the cost of medicines during delivery is affordable in Tana River County.

Majority of the respondents at 73.4% did not agree that women pay for consumables during hospital delivery. However, only 9.6% agreed to a high extent to the statement. The mean of the responses was 1.36 and the standard deviation was 0.15. This implies that the cost of buying consumables during delivery is affordable in Tana River County.

The study also assessed the impact of the transport cost to the facility and additional cost paid to the health care worker during delivery on utilization of delivery services. Majority of the respondents at 71.6% did not agree that the transport cost to the facility during delivery is very high. However, only 14.0% agreed to the statement to a great extent. The mean of the responses was 1.42 and the standard deviation was 0.23. This implies that the cost of transport to the nearby hospital during delivery is affordable in Tana River County.

Majority of the respondents at 68.4% did not agree that additional cost paid to the health care worker during delivery is affordable. However, only 12.5% agreed to the statement to a great extent. The mean of the responses was 1.44 and the standard deviation was 0.21. This implies that the additional cost paid to the health care worker during delivery is affordable in Tana River County.

On evaluation of the impact of the cost paid to accompanying TBA and amount charged for antenatal profile (laboratory tests during prenatal clinic) on utilization of maternal services, majority of the respondents at 76.4% did not agree that the cost paid to accompanying TBA is affordable. Only 11.0% agreed to this statement to a great extent. The mean of the responses was 1.35 and the standard deviation was 0.27. This implies that the cost of paying TBA during delivery is affordable in Tana River County.

Majority of the respondents at 74.3% did not agree that the amount charged for antenatal profile is too high. Only 11.0% agreed to the statement to a great extent. The mean of the responses was 1.37 and the standard deviation was 0.17. This implies that the cost of ANC services before delivery is affordable to the women of reproductive age in Tana River County.

Majority of the women reported that the consultation cost and the cost of supporting services during delivery was not high. This implies that the consultation cost charged during delivery is affordable to the women of reproductive age in Tana River County.

The findings can be explained by the fact that the study was conducted after the free maternity services policy (June, 2003) in the country public facilities. Although majority of the women delivered in private health facilities, most of the private facilities in the county are faith based where services are subsidized due to donor funding (County Integrated Development Plan, 2014).

The findings disagreed with a study by Mwabu et al (2000) in Kenya which reported that user fees charged for maternal services utilization was high and it negatively affected the utilization of delivery services. On a similar note, Randive, Diwan & De costa (2013) observed the launch of cash transfer scheme had increased the numbers of institutional delivery due to high cost of the services in the hospitals.

The findings disagreed with Kenyan studies by Lagarde & Palmer (2011) & Chuma, Musimbi, Okungu, Goodman, & Molyneux (2009) who found that majority of the women reported high cost of maternal health services in the public hospitals due to uneven implementation of free maternal services policy in the country. However, in this study, majority of the women (77.6%) had their recent delivery in a private facility. Most of the private facilities in the Tana River County are faith based whose services are either free or highly subsidized

4.5 Influence of access factors on utilization

The study aimed at evaluating the influence of access factors on utilization of maternal services. The rates of the measures were assessed on the practice of measures.

Table 9: Access factors

	Low extent %	Moderate extent %	Large extent %	Mean	Total Standard Deviation
The distance to the nearby health facility is less than 5KM	15.8%	21.8%	62.4%	2.47	.15
There is a reliable means of transport to the nearby health facility	20.3%	23.0%	56.7%	2.36	.20
There is good road network or access roads to the nearby health facility	19.4%	18.2%	62.4%	2.43	.20
The time taken to reach the nearby facility is less than an hour	17.9%	20.9%	61.2%	2.43	.28
The nearby health facility has enough health care workers to provide maternal services	17.3%	15.5%	67.2%	2.50	.17
The nearby health facility has adequate equipment to provide maternal services	21.8%	18.2%	60.0%	2.38	.12
There is availability of all the essential medicines for maternal services in the nearby facility	19.4%	20.0%	60.6%	2.41	.20
The nearby facility has good infrastructure for providing maternal health services	20.0%	17.9%	62.1%	2.42	.20
The health facility delivery services are good for me	21.2%	15.5%	63.3%	2.42	.22

While evaluating the influence of access factors on utilization of maternal services by women of reproductive age, majority of the respondents at 62.4% stated to a great extent that the distance to the nearby hospital is less than 5km. 15.8% did not agree to the statement. The mean and standard deviation of the responses was 2.47 and 0.15 respectively. 56.7% of the respondents stated that there is a reliable means of transport to the nearby health facility to a great extent. 20.3% did not agree to this statement. The mean and standard deviation of the responses was 2.36 and 0.20 respectively.

Majority of the respondents at 62.4% stated to a great extent that there is good road network or access roads to the nearby health facility. 19.4% agreed to a low extent to the statement. The mean and standard deviation of the responses was 2.43 and 0.20 respectively. 61.2% of the respondents stated that the time taken to reach the nearby facility is less than an hour to a great extent. 17.9% did not agree to this statement. The mean and standard deviation of the responses was 2.43 and 0.28 respectively.

Majority of the respondents at 67.2% stated to a great extent that the nearby hospital has enough health workers to provide maternal services. 17.3% did not agree to the statement. The mean and standard deviation of the responses was 2.50 and 0.17 respectively. 60.0% of the respondents stated that the nearby hospital has adequate equipment to provide maternal services to a great

extent. 21.8% did not agree to this statement. The mean and standard deviation of the responses was 2.38 and 0.12 respectively.

Majority of the respondents at 60.6 % stated to a great extent that there is availability of all the essential medicines for maternal services in the nearby facility. 19.4% did not agree to the statement. The mean and standard deviation of the responses was 2.41 and 0.20 respectively. 62.1% of the respondents stated that the nearby facility has good infrastructure for providing maternal health services to a great extent. 20.0% did not agree to this statement. The mean and standard deviation of the responses was 2.42 and 0.20 respectively.

Majority of the respondents at 63.3% stated to a great extent that the health facility delivery services are good for them. 21.2% did not agree to the statement. The mean and standard deviation of the responses was 2.42 and 0.22 respectively. The findings can be explained by the fact that majority (77.6%) of the women delivery in the private hospitals. Most of the private hospitals are located strategically in highly populated areas. Therefore, the distance travelled to the nearby facilities is short.

The findings disagreed with studies by Samson (2012) and Alemi & Tekehaymot (2016) who observed that majority of the women lived more than 5 km from a nearby facility which had a negative effect on utilization of delivery services. A study in north eastern Kenya by Mohamed (2020) found that essential medical supplies were unavailable in their nearby facility most of the times which had a positive effect on utilization of delivery services. The findings also disagreed with a study in Migori, Kenya which observed that majority of the women noted access factors such as distance, availability of trained health workers influencing their utilization of delivery services (Cheptum et al., 2014).

4.6 Influence of socio-demographic factors on utilization

The study aimed at evaluating the influence of socio-demographic factors on utilization of delivery services. The rates of the measures were assessed on the practice of measures.

Table 10: Socio-demographic factors

	Low extent %	Moderate extent %	Large extent %	Mean	Total Standard Deviation
I have learnt on the importance of hospital delivery in school	11.0%	17.0%	71.9%	2.61	.68
The elderly women are more knowledgeable on the importance of hospital delivery	14.6%	15.2%	70.1%	2.56	.74
Young girls are able to make decisions about the choice of delivery place	63.9%	16.7%	19.4%	1.34	.80
Multiparous women have a higher understanding on the importance of hospital delivery	20.9%	19.1%	60.0%	2.39	.81
I have knowledge on the right nutrition of a mother and child	19.1%	17.0%	63.9%	2.45	.79
I have knowledge on the importance of exclusive breastfeeding my child for six months	19.4%	14.9%	65.7%	2.46	.80
My husband is aware of the risks associated with unskilled delivery	18.8%	16.1%	65.1%	2.46	.79
Elderly women are more knowledgeable on breastfeeding techniques	18.2%	16.4%	65.4%	2.47	.78
Young mothers have knowledge on the complications associated with delivery	17.6%	12.2%	70.1%	2.53	.78
Mothers who are educated know the importance of post-delivery care	18.8%	15.2%	66.0%	2.47	.79
Marriage partners always support the women during pregnancy and delivery	19.7%	11.9%	68.4%	2.49	.80

On evaluating the influence of socio-demographic factors on utilization, majority of the respondents at 71.9% stated to a great extent that they have learnt the importance of hospital delivery in school. 11.0% did not agree to the statement. The mean and standard deviation of the responses was 2.61 and 0.68 respectively. 70.1% of the respondents stated that the elderly women are more knowledgeable on the importance of hospital delivery to a great extent. 14.6% did not agree to this statement. The mean and standard deviation of the responses was 2.56 and 0.74 respectively. This implies that increase in literacy increases the knowledge on the importance of delivery by women of reproductive age.

Majority of the respondents at 63.9 % stated to a low extent that young girls are able to make decisions about the choice of delivery place. 19.4% did agree to the statement. The mean and standard deviation of the responses was 1.34 and 0.80 respectively. 60.0% of the respondents stated that multiparous women have a higher understanding on the importance of hospital delivery to a great extent. 20.9% did not agree to this statement. The mean and standard deviation of the responses was 2.39 and 0.81 respectively. This implies that increase in age of the women increases their capacity for decision making about the choice of delivery place.

Majority of the respondents at 63.9% stated to a great extent that they have knowledge on the right nutrition of a mother and child. 19.1% did not agree to the statement. The mean and standard deviation of the responses was 2.45 and 0.79 respectively. 65.7% of the respondents stated that they have knowledge on the importance of exclusive breastfeeding their child for six months to a great extent. 19.4% did not agree to this statement. The mean and standard deviation of the responses was 2.46 and 0.80 respectively. This implies that majority of the respondents had knowledge on the right nutrition of a mother and her child.

Majority of the respondents at 65.1% stated to a great extent that their husband is aware of the risks associated with unskilled delivery. 18.8% did not agree to the statement. The mean and standard deviation of the responses was 2.46 and 0.79 respectively. 65.4% of the respondents stated that the elderly women are more knowledgeable on breastfeeding techniques to a great extent. 18.2% did not agree to this statement. The mean and standard deviation of the responses was 2.47 and 0.78 respectively. This implies that majority of the respondents husbands are aware of the risks associated with unskilled delivery.

Majority of the respondents at 70.1% stated to a great extent that young mothers have knowledge on the complications associated with delivery. 17.6% did not agree to the statement. The mean and standard deviation of the responses was 2.53 and 0.78 respectively. 66.0% of the respondents stated that mothers who are educated know the importance of post-delivery care to a great extent. 18.8% did not agree to this statement. The mean and standard deviation of the responses was 2.47 and 0.79 respectively. This implies that majority of the young mothers had knowledge on the complications associated with delivery. It also implies that majority of the young mothers had an opportunity to be counseled on the obstetric complications during their ANC (antenatal clinic) visits.

Majority of the respondents at 68.4% stated to a great extent that the marriage partners always support the women during pregnancy and delivery. 19.7% did not agree to the statement. The mean and standard deviation of the responses was 2.49 and 0.80 respectively. This implies that majority of the women are supported by their partners during delivery. This also agrees with the finding that majority of the women in kipini location are married.

Similarly, a study in Rwanda by Manishimwa (2011) reported that older, richer and more educated women have a higher knowledge and understanding of the importance of hospital delivery and delivery related complication than the younger, poorer and illiterate women. Magadi et al., (2000) agreed with the findings that older and married women are more knowledgeable on the importance of utilization of delivery services than the younger women.

However, the findings disagreed with Manishimwa (2011) that young mothers are knowledgeable on the complications associated with delivery. The findings disagreed with a Kenyan study by which found more younger women utilizing delivery services than the older counterparts (Lidoroh, 2013).

4.7 Utilization of delivery services

The researcher assessed whether the women used delivery services in a health facility in the last pregnancy.

Table 10: Delivery services utilization

	Frequency	Percent
No	67	20.0
Yes	268	80.0
Total	335	100.0

Majority of the respondents (80%) noted that they received delivery services in a health facility while a proportion of 20% did not receive delivery services in a health facility. This implies that more women in kipini location prefer delivery services from a hospital. Therefore the prevalence of skilled/institutional delivery in kipini location is high. This can be attributed to the free maternal health policy in the country. This is far higher than the prevalence of skilled delivery in the country at 44% (Okoth, 2014). However, majority of the women in kipini location had their recent delivery in a private health facility. The free maternal services policy of 2003 in the country might have contributed to the higher percentage of hospital delivery given the high poverty index in Tana River County.

The findings disagree with a study in rural Ethiopia where the utilization of antenatal care services was 74.3%. However, only a third of the mothers utilized delivery services in the hospitals (Kifle et al., 2017)

The researcher inquired from the respondents the facilities they prefer to receive delivery services. Findings are as shown in Table 11.

Table 11 Delivery services facility

	Frequency	Percent
Public (Government owned facility)	75	22.4
Private (NGO/FBO/Private owned)	260	77.6
Total	335	100.0

Majority of the respondents (77.6%) noted that they prefer Private (NGO/FBO/Private owned) services while a proportion of 22.4% did prefer Public (Government owned facility) for delivery services. The findings imply that Private (NGO/FBO/Private owned) are in a position to offer better services in Tana River County. From the County Health Information System data (2020), out of 936 women attending ANC in Kipini Health Centre only 86 (9.2%) come back to deliver in the health centre. This explains the low coverage of hospital/skilled delivery in Kipini health centre (main public health facility in kipini location) due to high preference of the women to deliver in private facility (77.6%).

The findings disagree with a study in Kibera slums which found higher percentage (43.9%) of hospital delivery occurring in public facility. The difference can be explained by the free maternity services in the public facilities more preferable by women in the slum area. Majority of the women in the rural Kenya still find the cost of maternal services in public health facilities to be high due to uneven implementation of the policy in the county (Chuma et al., 2009). Most of the private facilities in Tana River County are faith based organization (FBO) owned which provide either free or subsidized maternal health services to women of reproductive age.

4.8 Inferential statistics

4.8.1 Cultural Factors on utilization

The research analyzed the influence of cultural factors on utilization of delivery services in Tana River County, Kenya. The results were presented in Table 4.16 below.

Table 12: Cultural factors

	B	S.E.	Wald	Sig.	Exp(B)	95% EXP(B) Lower Upper	C.I.for
I prefer to deliver at home	-2.724	0.692	15.495	0.000	0.066	0.017	0.255
I prefer to be assisted in delivery by the culturally trained midwives	-2.467	0.764	10.411	0.001	0.085	0.019	0.38
I prefer being attended to by a healthcare worker of a certain gender	-1.61	0.548	8.616	0.003	0.2	0.068	0.586
I hold cultural delivery practices in high esteem	-1.121	0.833	1.811	0.178	0.326	0.064	1.668
My culture emphasizes privacy during delivery	-1.229	0.552	4.947	0.026	0.293	0.099	0.864
I believe that delivering in a health facility will deny me some cultural practices	-0.906	0.883	1.054	0.305	0.404	0.072	2.28

At a significance level of 0.05, preference of delivering at home was statistically associated with utilization of delivery services ($p < 0.05$). An increase in preference of delivering at home decreases the utilization of delivery services by 0.066 times. This implies that increase in preference of home delivery results in a decrease in utilization of delivery services in a health facility.

Also, preference of being assisted in delivery by the culturally trained midwives was statistically associated with utilization of delivery services at ($p < 0.05$). An increase in preference of being assisted in delivery by the culturally trained midwives decreases the utilization of delivery services by 0.085 times. This implies that women preferring to be assisted by Traditional birth attendants (TBAs) are less likely to deliver in a health facility than the ones not preferring TBAs.

Preference of being attended to by a health care worker of a certain gender was statistically associated with utilization of delivery services at significance level of 0.05 ($p < 0.05$). An increase in preference of being attended to by a health care worker of a certain gender decreases the utilization of delivery services by 0.2 times. This implies that women with gender preference of a health worker during delivery are less likely to deliver in a health facility than those with no gender preference.

Culture emphasizing on privacy during delivery was statistically associated with utilization of delivery services at significance level of 0.05 ($p < 0.05$). An increase in culture emphasizing on privacy during delivery decreases the utilization of delivery services by 0.293 times. This implies that women emphasizing on privacy during delivery are less likely to deliver in a health facility than those not emphasizing on privacy.

The findings agreed with Stephenson & Matthews (2004) and Sarin (1997) who reported that cultural practices negatively affected the use of delivery services. A study in Ethiopia by Ahmed, Demissie, Worku, Abrha & Berhane (2019) reported that preference of TBAs, lack of women decision making powers, religious practices and household chores negatively affected the

utilization of delivery services. In Ghana, Esema & Sapor concluded that cultural factors negatively affected utilization of delivery services.

4.8.2 Cost Factors

The research analyzed the influence of cost factors on utilization of delivery services in Tana River County in Kenya. The results were presented in Table 13 below.

Table 13: Cost factors

	B	S.E.	Wald	Sig.	Exp(B))	95% EXP(B) Lower	C.I.for Upper
The consultation cost charged during delivery is too high for the women	-2.486	0.978	6.455	0.011	0.083	0.012	0.567
The cost of laboratory services charged during hospital delivery is too high	0.027	1.041	0.001	0.979	1.027	0.133	7.909
The amount of money charged by the hospital for medicines during delivery is not acceptable	-0.68	0.953	0.51	0.475	0.506	0.078	3.279
Women pay for consumables (such as cotton wool, basins, gloves etc.) during hospital delivery	-0.921	1.389	0.44	0.507	0.398	0.026	6.056
The transport cost to the facility during delivery is very high	-1.52	0.685	4.918	0.027	0.219	0.057	0.838
Additional cost paid to the health care worker during delivery is affordable	-2.397	1.125	4.543	0.033	0.091	0.01	0.825
The cost paid to accompanying TBA during delivery is affordable	-1.933	0.912	4.493	0.034	0.145	0.024	0.864
The amount charged for antenatal profile (laboratory tests during prenatal clinic) is too high	0.12	1.489	0.006	0.936	1.127	0.061	20.866

At a significance level of 0.05, consultation cost charged during delivery being too high for the women was statistically associated with utilization of delivery services ($p < 0.05$). An increase in consultation cost charged during delivery decreases the utilization of maternal health care services by women of reproductive age by 0.083 times. This implies that fewer women utilize delivery services when the consultation cost is high.

Transport cost to the facility during delivery being very high was statistically associated with utilization of delivery services by women of reproductive age ($p < 0.05$). An increase in transport cost to the facility during delivery decreases the utilization of delivery services by 0.219 times. This implies that fewer women utilize delivery services when the transport cost is high.

Additional cost paid to the health care worker during delivery being affordable was statistically associated with utilization of delivery services ($p < 0.05$). An increase in additional cost paid to the health care worker during delivery decreases the utilization of delivery services by 0.091 times.

This implies that fewer women utilize delivery services when additional cost is charged by health workers during delivery.

The cost paid to accompanying TBA during delivery was statistically associated with utilization of delivery services ($p < 0.05$). An increase in cost paid to accompanying TBA during delivery decreases the utilization of delivery services age by 0.145 times. This implies that fewer women utilize delivery services when their TBA costs during delivery. The findings agreed with Machio (2008) and Mwabu et al (2000) in Kenya who found a positive effect of user fees on the utilization of delivery services. Abekah-Nkrumah et al (2011) also found a positive effect of user fees on the utilization of delivery services in a Ghanaian population.

4.8.3 Access factors on utilization

The research analyzed the influence of access factors on utilization of delivery services in Tana River County, Kenya. The results were presented in Table 15 below.

Table 15 Access factors

	B	S.E.	Wald	Sig.	Exp(B)	95% C.I. for EXP(B)	
						Lower	Upper
The distance to the nearby health facility is less than 5KM	3.4	1	11.552	0.001	29.963	4.218	212.85
There is a reliable means of transport to the nearby health facility	0.346	1.149	0.091	0.763	1.413	0.149	13.443
There is good road network or access roads to the nearby health facility	2.649	1.057	6.276	0.012	14.143	1.78	112.37
The time taken to reach the nearby facility is less than an hour	3.013	1.185	6.469	0.011	20.357	1.996	207.586
The nearby health facility has enough health care workers to provide maternal services	3.106	1.087	8.162	0.004	22.323	2.651	187.964
The nearby health facility has adequate equipment to provide maternal services	-0.242	1.367	0.031	0.86	0.785	0.054	11.433
There is availability of all the essential medicines for maternal services in the nearby facility	0.83	0.864	0.922	0.337	2.293	0.422	12.471
The nearby facility has good infrastructure for providing maternal health services	0.848	1.407	0.363	0.547	2.335	0.148	36.828
The health facility delivery services are good for me	-1.159	1.136	1.041	0.308	0.314	0.034	2.907

At a significance level of 0.05, the distance to the nearby health facility being less than 5KM has been statistically associated with utilization of delivery services ($p < 0.05$). The short distance to the nearby health facility increases the utilization by 29.963 times. This implies that more women utilize delivery services when the distance to a health facility is less than 5km.

There being good road network or access roads to the nearby health facility was statistically associated with utilization of delivery services ($p < 0.05$). Good road network or access roads to the nearby health facility increase the utilization of delivery services by 14.143 times. This implies

that more women utilize delivery services when road network or access roads to the nearby facility are good than when they are bad.

The time taken to reach the nearby facility being less than an hour was statistically associated with utilization of delivery services ($p < 0.05$). The time taken to reach the nearby facility increases the utilization of delivery services by 20.357 times. This implies that more women utilize delivery services when the time taken to reach a nearby facility is less than an hour than when it is longer.

The nearby health facility having enough health care workers to provide delivery services was statistically associated with utilization ($p < 0.05$). The nearby health facility having enough health care workers to provide delivery services increases the utilization by 22.323 times. This implies that more women utilize delivery services when a health facility has enough health care workers compared to those that have shortage of health care workers.

The finding agreed with Samson (2012) and Alemi & Tekehaymot (2016) who observed that distance of more than 5 km from a nearby facility negatively affected utilization of delivery services. A study in north eastern Kenya by Mohamed (2020) found that availability of medical supplies had a positive and a statistically significant effect on utilization of delivery services. The findings also agreed with a Zambian study by Rashid, Chowdhury, Kader, Hiswals & Macassa (2022) and an Ethiopian study by Kidanu, Degu & Tiruye (2017) who found that distance of more than 5km from the nearby facility negatively affected utilization of delivery services.

4.8.4 Socio-demographic factors on utilization

The research analyzed the influence of socio-demographic factors on utilization of delivery services in Tana River County Kenya. The results were presented in Table 16 below.

Table 16: Socio-demographic factors

	B	S.E.	Wald	Sig.	Exp(B)	95% C.I.for EXP(B)	
						Lower	Upper
I have learnt on the importance of hospital delivery in school	3.88	1.034	14.077	0	48.423	6.379	367.545
The elderly women are more knowledgeable on the importance of hospital delivery	3.675	1.498	6.02	0.014	39.432	2.094	742.404
Young girls are able to make decisions about the choice of delivery place	0.316	1.284	0.061	0.806	1.371	0.111	16.988
Multiparous women have a higher understanding on the importance of hospital delivery	-2.346	2.01	1.362	0.243	0.096	0.002	4.924
I have knowledge on the right nutrition of a mother and child	1.427	1.507	0.896	0.344	4.164	0.217	79.853
I have knowledge on the importance of exclusive breastfeeding my child for six months	2.516	1.659	2.3	0.129	12.376	0.479	319.558
My husband is aware of the risks associated with unskilled delivery	-3.437	2.243	2.348	0.125	0.032	0	2.609
Elderly women are more knowledgeable on breastfeeding techniques	-1.758	2.442	0.518	0.472	0.172	0.001	20.669
Young mothers have knowledge on the complications associated with delivery	3.049	1.778	2.941	0.086	21.087	0.647	687.363
Mothers who are educated know the importance of post-delivery care	0.712	1.293	0.303	0.582	2.038	0.162	25.67
Marriage partners always support the women during pregnancy and delivery	1.005	0.947	1.127	0.288	2.733	0.427	17.489

At significant level of 0.05, having learnt the importance of hospital delivery in school was statistically associated with utilization of delivery services ($p < 0.05$). Having learnt the importance of hospital delivery in school increases the utilization of delivery services by women of reproductive age by 48.423 times. This implies that more women utilize delivery services when they have knowledge on the importance of delivery in a hospital. It also implies that educated women are more likely to utilize delivery service since they had knowledge of the importance of delivery services from school.

Elderly women being more knowledgeable on the importance of hospital delivery statistically associated with utilization of delivery services ($p < 0.05$). Elderly women being more knowledgeable on the importance of hospital delivery increase the utilization of delivery services by 39.432 times. This implies that the higher the age of the women the more the knowledge on the importance of hospital delivery. Older women have accumulated enough knowledge and experience on the importance of hospital delivery due to old age. It also implies that it is easier to counsel and convince older women during prenatal visits on hospital delivery due to high level of experience and accumulated knowledge.

The findings agreed with Ebuchi, Roberts & Inem, (2006) who noted that there is a strong positive effect of the women's literacy level on the use of delivery services. Chakraborty, Islam, Chowdhury, Bari & Akhtar (2003) reported that mother's education positively affected the use of antenatal care and delivery services by women of reproductive age. The most consistent determinant of utilization of maternal services is women level of education (Becker et al., 1993). Women education increases awareness of the complications and the availability of services (Costello et al 1996).

4.9 Overall regression

To understand the relationship between the independent and dependent variables regression analysis was performed. Regression analysis was done to determine influence of cultural factors, cost factors, access factors and socio-demographic factors on utilization delivery services. The regression model summary is as attached.

Table 17 Regression Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	.000 ^a	.632	0.657

The results were presented in Table 17. Cultural factors, cost factors, access factors and socio-demographic factors were found to be satisfactory in contribution as factors of Utilization of maternal health care services. This was supported by coefficient of determination i.e. the R square of 0.632. This shows that Cultural factors, cost factors, access factors and socio-demographic factors explain 63.2% of utilization of delivery services. The results implied that the model goodness of fit was satisfactory. This also implies that 36.8% of the variation in the dependent variable is attributed to other variables not captured in the model.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Conclusion

Cultural factors have a negative relationship to utilization of delivery services by women of the reproductive age in Tana River County. Cost factors have a negative relationship to utilization of delivery services by women of the reproductive age in Tana River County. Access factors have a positive and significant relationship to utilization of delivery services by women of the reproductive age in Tana River County. Socio-demographic factors have a positive and significant relationship to the utilization of delivery services by women of the reproductive age in Tana River County.

Recommendations

The skilled attendants to allow some safe cultural and religious practices during delivery so as to encourage the utilization of delivery services. The public hospital management to work closely with the private facilities to ensure that allowed cultural practices is safe and well supervised to avoid any associated morbidity and mortality during delivery. The study recommends that the county government enforce the free maternity policies by making sure that no hidden or additional fee is charged to the women during delivery. The county government to consider providing some

technical and financial support to private facilities since majority of the women delivers in private facilities. The government should increase the number of permanent and mobile health facilities so that every women (including nomadic population) have access to delivery services. The county government and reproductive health organizations to support private hospitals in terms of staffing needs, so that women can be assisted by skilled and well trained health workers. The county government to introduce youth friendly reproductive health programs targeting on teenage pregnant women and other vulnerable women of reproductive age. The government should also construct more girls' schools, provide scholarships to the girls and enhance awareness programs to improve literacy levels to the girls and women of reproductive age.

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