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FACTORS INFLUENCING UPTAKE OF ANTENATAL CARE IN TAITA TAVETA COUNTY, KENYA

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Abstract

Purpose: The general purpose of the study was to establish factors influencing uptake of antenatal care among pregnant women.

Methodology: The study was conducted in TaitaTaveta County, Kenya, which had a population of 338,696, with 81,288 women estimated to be of reproductive age, and 9,823 women estimated to be pregnant per year. The county had a total of 60 public health facilities, including 1 public referral hospital, 3 sub-county hospitals, 18 health centres and 38 dispensaries. The total workforce for the public health facilities was 1000 health care providers, including 300 (30%) nurses/midwives, 25 (2.5%) doctors, and 1750 community health volunteers. Data was collected using structured questionnaires for the mothers (n=381) and key informant interview for the in-charges (n=17). Data was analysed using SPSS, version 23. Chi-square and Spearman's R tests, and categorical regression were used to determine the relationship between uptake of antenatal care and the independent variables. The results were summarized and presented in form of tables, figures and charts.

Findings: Results indicated that antenatal care initiation time ($R^2 = 0.07$) had a weak positive influence on uptake of antenatal care, while skilled health providers' attitudes ($R^2 = 0.82$), availability of community health volunteers ($R^2 = 0.78$), and availability of skilled health providers ($R^2 = 0.92$) had a strong positive influence on uptake of antenatal care.

Keywords: *Antenatal Care Uptake, Antenatal Care Initiation Time, Skilled Health Providers, Community Health Volunteers*

1.0 INTRODUCTION

Service delivery is the immediate deliverable of the resources put into the health system, which include the health workforce, procurement and supplies, and financing. Increased resources into the health system is expected to improve service delivery, subsequently enhanced uptake of healthcare services. Healthcare services meeting minimum quality standard and secured uptake to the general population is what describes a functional health system. To achieve the Sustainable Development Goals that include interventions to reduce maternal and child mortality, strengthening service delivery is critical (Stenberg *et al.*, 2017).

Antenatal care, also referred to as perinatal care, is a type of preventive healthcare aiming at providing regular check-ups, allowing a skilled health provider to treat and prevent potential health problems during the course of the pregnancy, at the same time promoting healthy lifestyles that benefit both the mother and child (Makii, 2015). It is a critical opportunity for health providers to deliver care, support and information to pregnant women. It focuses on healthy lifestyle promotion, good nutrition, detection and prevention of diseases, provision of family planning counselling and support to women who experience any form of intimate partner violence (WHO, 2016).

World Health Organization [WHO] (2016) recommends a minimum of four focused antenatal care visits throughout the entire gestation starting in the first 16 weeks of pregnancy. This provides an opportunity for timely detection of pregnancy complications for appropriate interventions which benefits both the mother and her unborn baby. According to the Sustainable Development Goal number 3, countries should strive to reduce maternal/neonatal mortality ratio to less than 70 per 100,000 and 12 per 1,000 deliveries respectively by 2030.

In TaitaTaveta County, the uptake of antenatal care is low. It is only 58.9% of all the pregnant women manage to make the recommended minimum 4 focused visits to a skilled health provider (MOH, 2013). The county has also been rated among the top 10 counties in Kenya with the highest maternal mortality ratio of 603 per 100,000 live births (WHO, 2014). A ratio equal to or above 300 maternal deaths per 100,000 live births is considered high. These low rates of uptake of antenatal care in the county is highly likely to put the mothers at risk of pregnancy related complications and possible maternal and neonatal deaths (WHO, 2016). The study findings are therefore going to inform stakeholders to initiate appropriate measures to improve ANC services in the county.

2.0 LITERATURE REVIEW

2.1 Overview of Antenatal Care

Antenatal care, also referred to as perinatal care, is a type of preventive healthcare aiming at providing regular check-ups, allowing a skilled health provider to treat and prevent potential health problems during the course of the pregnancy, at the same time promoting healthy lifestyles that benefit both the mother and the unborn baby (Makii, 2015). To make improvement of maternal and child health and subsequently prevention of maternal deaths, appropriate and timely uptake of antenatal care is critical.

The goal of antenatal care is to detect and treat any existing pregnancy related complications timely to avoid mortalities for both the mother and the unborn baby. In view of this, the World Health Organization (WHO) introduced focused antenatal care which recommends a minimum of four focused antenatal care visits, starting in the first 16 weeks of pregnancy as outlined below:

1st ANC visit: Within 16 weeks of pregnancy

2nd ANC visit: Between 16 - 28 weeks of pregnancy

3rd ANC visit: Between 28 - 32 weeks of pregnancy

4th ANC visit: Between 32 - 40 weeks of pregnancy

These are the four WHO recommended bare minimum number of antenatal visits, however the skilled health provider may recommend for more visits based on the needs of the pregnant mother and the unborn baby. Antenatal care is a critical opportunity for the health provider to offer vital health information and social support and counselling to women and girls relating to life-style risks. It connects them with the health system, subsequently to an increased likelihood of delivery with a skilled birth attendant and continuing care after the baby is born (WHO, 2016).

2.2 Factors influencing early Initiation of Antenatal Care

Receiving Antenatal Care (ANC) from a skilled health provider is important in monitoring pregnancy, reduction of potential risks for maternal and child during pregnancy and delivery. It also helps achieve the Sustainable Development Goals (SDGs) which include the delivery of interventions that reduce child mortality and maternal mortality burden.

Early initiation and optimal ANC frequency is critical in ensuring safe motherhood and child survival, this is because early ANC initiation provides an opportunity to screen for any pregnancy related complications for timely referral and subsequent appropriate treatment. It also ensures that the health provider makes follow-ups of the foetal

development as well as the health of the mother. It also creates a good relationship between the mother and the health provider which is an important pre-condition component for safe delivery and child survival.

Antenatal sessions provide an opportunity for the mother and the family at large to receive health education about danger signs during pregnancy, appropriate nutrition, preventive and curative treatment, breastfeeding and contraceptive options available. To enjoy these health benefits, the pregnant mother should initiate antenatal care early and make at least the four recommended antenatal care visits (WHO, 2016).

2.3 Influence of Skilled Health Care Providers' Attitude on Uptake of Antenatal Care

The burden of high maternal and child mortality continue to be a public health concern not only in the region but globally despite several initiatives to address it, in large part due to inadequate uptake of antenatal care. Attitude of healthcare providers influence health care seeking and quality of care (Manava *et al.*, 2015).

The attitude of the health care providers are an important component of quality as they influence both positively and negatively how pregnant women, and their partners and families perceive and experience antenatal care services. Lack of respectful care from the health providers, may lead to dissatisfaction with the health system, diminishing the likelihood of pregnant women seeking ANC, delivery and postnatal services. In addition, healthcare providers' attitude might directly affects the well-being of patients and clients, and the relationship between patients and the providers (WHO, 2014). Furthermore, negative attitudes could undermine the quality of care and the effectiveness of maternal and infant health promotion efforts, in addition to compromising women's essential right to humane and respectful maternal healthcare (WHO, 2014). Taken together, the attitudes of the healthcare providers are an important determinants of maternal and infant health outcomes (Holmes & Goldstein, 2012).

2.4 Influence of Community Health Volunteers on Uptake of Antenatal Care

The term community health volunteers (CHVs) is composed of a variety of community health aides selected, trained and working in their communities from which they come from. A much widely accepted definition for the community health volunteers, is that community health volunteers should be members of the communities where they work, selected by their own communities, answerable to the same communities for their activities, be supported by the health system even though not necessarily being part of its organization, and have shorter training than professional workers (Oliver, 2015).

The most important role which the CHVs play is to act as a bridge between their communities and the formal health services in all aspects of health development, the

bridging activities of CHVs provide opportunities to improve the quality of healthcare services to the communities, and perhaps more importantly, community management and ownership of health-related programs. CHVs are the best acceptable link between the health sector and the communities which can be developed to meet the goal of improved health in the near term (Oliver, 2015).

2.5 Influence of Availability of Skilled Health Providers on Uptake of Antenatal Care

Healthcare workers include all the health providers who offer healthcare services with an aim of protecting and improving the lives of the people. Healthcare workers are generally composed of the management, frontline healthcare providers and the support workers, all of whom contribute towards improvement of the health of the people. They are composed of the unpaid health workers, lay and the professional health workers which are either in the public or private sector. Generally there is a strong positive relationship between human resource for health density and the service coverage as well as the health outcome. Human resource for health must be available, responsive, competent and productive for a health system to perform optimally (Yohannes *et al.*, 2009).

The WHO recommends 2.3 health workers per 1000 population, however there is an estimated shortage of more than 4 million health workers globally. According to the WHO Report of 2006, Kenya is rated among 57 countries with human resource for health critical shortages. Sub Saharan African being reported with the greatest shortfall among the various cadres of healthcare workers.

2.6 Conceptual Framework

Conceptual Framework is a tool which is analytical, with several variations and contexts used to make conceptual distinctions and organize ideas.

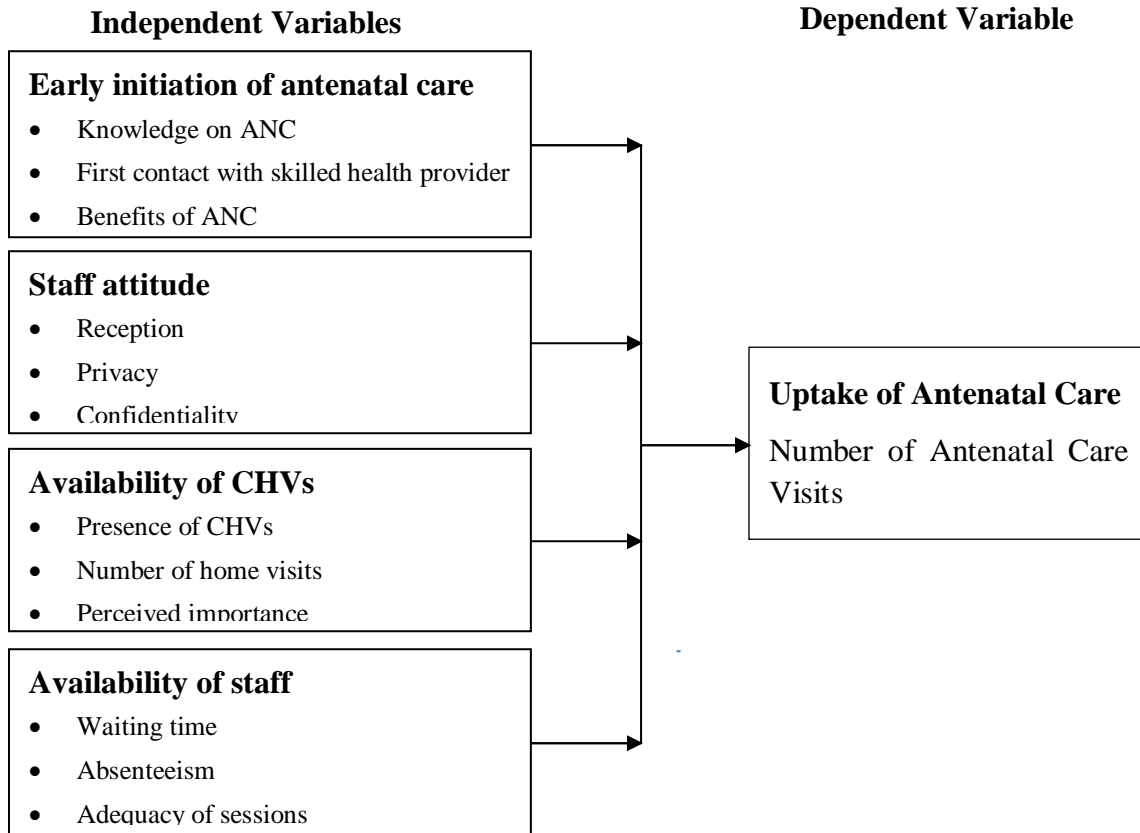


Figure 1: Conceptual Framework

3.0 RESEARCH METHODOLOGY

The study was conducted in TaitaTaveta County, Kenya, whose total population was 338,696. The number of women of reproductive age was 81,288, with estimated number of pregnant women of 9,823 per year. The county had 4 sub-counties, 1 public referral hospital, 3 sub-county hospitals, 18 health centres and 38 dispensaries, making a total of 60 public health facilities. There was 1 private hospital, 1 faith-based hospital, and 22 private clinics making a total of 90 health facilities. The total workforce for the public health facilities was 1000 health care providers, with nurse/midwives being 300 (30%) and doctors 25 (2.5%), and 1750 community health volunteers (CGTT, 2013) The study used structured questionnaires as the primary data collection methods for the mothers (n=381) and key informant interview for the in-charges (n=17). The questionnaires and the key informant interview schedules were administered to the respondents on daily basis throughout the planned period of 30 days. Both the quantitative and qualitative data was analyzed using Statistical Package for the Social Sciences (SPSS) version 23. The

results were then summarized and presented in form of frequency tables, figures and charts. In addition, the researcher performed bivariate analysis using Chi-square and Spearman’s R tests in order to test the significance, strength and nature of association between uptake of antenatal care and the independent sub-variables. Moreover, multivariate analysis using categorical regression with optimal scaling was performed to determine the relationship between the study variables.

4.0 RESULTS

4.1 Demographic Characteristics

4.1.1 Mothers Characteristics

According to Table 1, majority, 227 (59.6%) of the mothers were aged between 21-24 years, corresponding to the mean reproductive age of 20.3 years for Kenyan women (KNBS, 2014). The results also indicate that majority, 221 (58.0%) of the mothers had either no formal education or primary education, which could affect ANC uptake. Lastly, majority of the mothers, 311 (81.6%) were Christians while 70 (18.4%) were Muslims.

Table 1: Demographic Characteristics of Mothers

Characteristics of Mothers		No. of Mothers	%Age of Mothers
Age Group (Years)	15-20	66	17.3%
	21-34	227	59.6%
	35-40	82	21.5%
	41-45	6	1.6%
Level of Education	None	14	3.7%
	Primary	207	54.3%
	Secondary	119	31.2%
	Diploma	34	8.9%
	Graduate	7	1.8%
Religion	Christianity	311	81.6%
	Islam	70	18.4%

According to Table 2, all, 17 (100%) of the in-charges were nurses/midwives, and the highest level of education attained by the majority, 15 (88.2%) was diploma level, while 15 (88.2%) of the in-charges were Christians.

Table 2: Demographic Characteristics of the In-charges

Characteristics of In-charges		No. of In-charges	%Age of In-charges
Cadre	Nurse/Midwife	17	100.0%
Age Group (Years)	26-30	5	29.4%
	31-35	2	11.8%
	36-40	3	17.6%
	41-45	1	5.9%
	46-50	5	29.4%
	Above 50	1	5.9%
Level of Education	Certificate	2	11.8%
	Diploma	15	88.2%
Religion	Christianity	15	88.2%
	Islam	1	5.9%
	Judaism	1	5.9%

4.2 Uptake of Antenatal Care

Despite the World Health Organization recommendation of at least 4 antenatal visits, and the knowledge on the benefits of seeking antenatal services from a skilled health provider, only 166 (43.6%) of the mothers managed 2 antenatal visits, 159 (41.7%) managed 3 visits and 56 (14.7%) managed just 1 visit as shown in Figure 2.

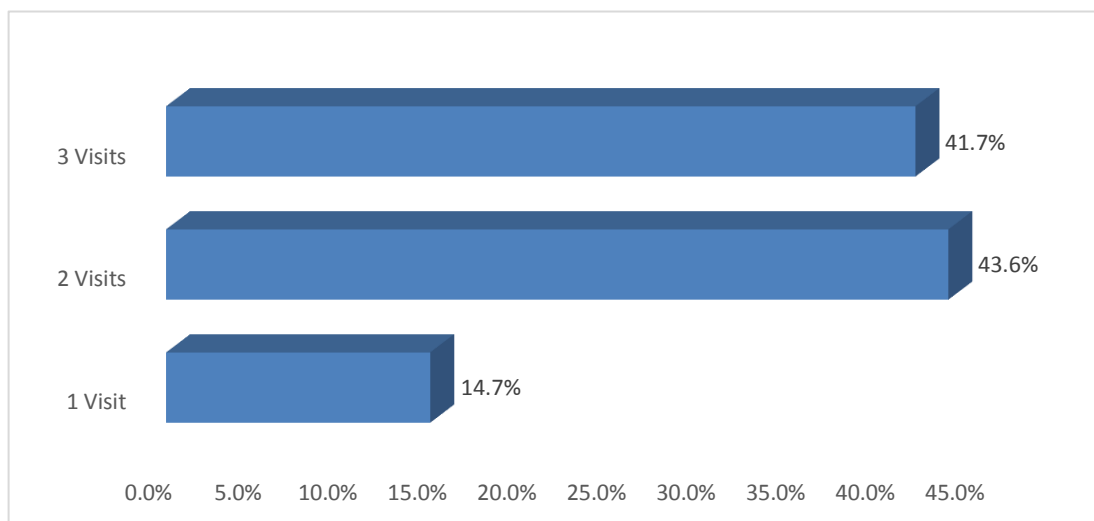


Figure 2: Number of ANC visits made by mothers in their previous pregnancies

4.2.1 Distribution of ANC Uptake across Demographic Categories

Table 3 shows the distribution of ANC uptake among the mothers across the categories of age, level of education and religion.

Table 3: Cross-Tabulation of Demographic Characteristics of Mothers and Uptake of Antenatal Care

Characteristic	Category	Number of ANC visits made					
		1 Visit		2 Visits		3 Visits	
		n = 56	%	n = 166	%	n = 159	%
Age (Years)	15-20	12	18.2%	30	45.5%	24	36.4%
	21-34	30	13.2%	94	41.4%	103	45.4%
	35-40	11	13.4%	41	50.0%	30	36.6%
	41-45	3	50.0%	1	16.7%	2	33.3%
Level of Education	None	6	42.9%	4	28.6%	4	28.6%
	Primary	26	12.6%	96	46.4%	85	41.1%
	Secondary	16	13.4%	51	42.9%	52	43.7%
	Diploma	7	20.6%	14	41.2%	13	38.2%
	Graduate	1	14.3%	1	14.3%	5	71.4%
Religion	Christianity	47	15.1%	126	40.5%	138	44.4%
	Islam	9	12.9%	40	57.1%	21	30.0%

Kruskal-Wallis H Test (for age and level of education) and Mann-Whitney U Test (for religion), at 0.05 significance level, revealed that uptake of ANC was not significantly different across the categories of age [$X^2(4) = 6.146, p = 0.269$], level of education [$X^2(3) = 3.928, p = 0.189$], and religion [$U = 9748.5, p = 0.137$]. This indicates that there is no association ANC uptake and age, level of education and religion.

4.3 Influence of ANC Initiation Time on Uptake of Antenatal Care

Table 4: Knowledge on Ideal Time for Initiation of Antenatal Care

Ideal time to initiate antenatal care	Mothers		In-charges	
	Frequency	(%)	Frequency	(%)
Immediately upon suspecting pregnancy.	113	29.7%	10	58.8%
1-4 Months	166	43.6%	7	41.2%
5-7 Months	77	20.2%	0	0.0%
8-9 Months	16	4.2%	0	0.0%
I do not know	9	2.3%	0	0.0%

Despite majority, 279 (73.3%) of the mothers having knowledge on the WHO recommended time of initiating antenatal care (within the first 16 weeks), as shown in Table 4, only 137 (36%) of them attended antenatal visits within the first 4 months of their previous pregnancies as indicated in Figure 3.

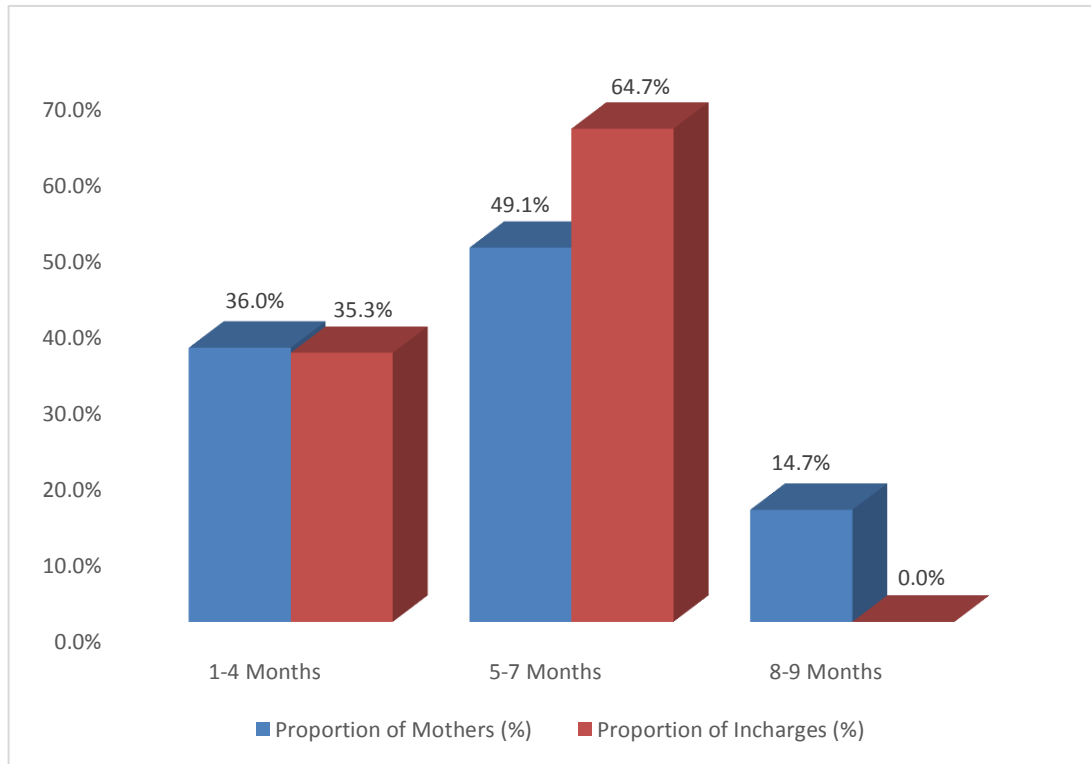


Figure 3: Actual time pregnant mothers initiated antenatal care

4.3.1 Relationship between ANC initiation time and uptake of ANC

Chi-square test and Spearman's correlation test at a significance level of $\alpha=0.05$ indicated that ANC initiation time had significant association [$\chi^2(6) = 102.854, p = 0.000$] and weak negative correlation [$R = -0.201, p = 0.000$] with uptake of ANC. In addition, regression analysis indicated an R^2 of 0.071 as shown in Table 6, suggesting that almost 7% of the variability in uptake of ANC was influenced by ANC initiation time. This shows that ANC initiation time had low degree of influence on uptake of ANC.

Table 5: Influence of Timing of ANC Initiation on Uptake of ANC

	Multiple R	R Square	Adjusted R Square	Apparent Prediction Error
Standardized Data	.267	.071	.066	.929

Dependent Variable: Number of ANC visits made

Predictors: knowledge of ANC & time of first ANC visit

4.4 Influence of Skilled Health Providers' Attitude on Uptake of Antenatal Care

Majority, 345 (90.6%) of the mothers, as shown in Table 7, were received well, 312 (81.9%) affirmed that privacy during ANC sessions was adequate, while 376 (98.7%) confirmed that the skilled health providers upheld confidentiality of the information shared during ANC sessions.

Table 6: Attitude of Skilled Health Providers towards Pregnant Women during ANC

Sub-variables	Category	Mothers	
		n	%
Reception during ANC visits	Not good	36	9.4%
	Somewhat good	48	12.6%
	Good	137	36.0%
	Very good	128	33.6%
	Extremely good	32	8.4%
Adequacy of privacy during service provision	Not adequate	32	8.4%
	Somewhat adequate	37	9.7%
	Adequate	155	40.7%
	Very adequate	71	18.6%
	Extremely adequate	86	22.6%
Upholding of confidentiality by health workers	Yes	376	98.7%
	No	5	1.3%

4.4.1 Relationship between skilled health providers' attitude and uptake of ANC

Chi-square test and Spearman's correlation test at a significance level of $\alpha=0.05$ indicated that reception during ANC visits had significant association [$X^2(8) = 564.235, p = 0.000$] and strong positive correlation [$R = 0.905, p = 0.000$] with uptake of ANC, while adequacy of privacy during service provision had significant association [$X^2(8) = 459.447, p = 0.000$] and strong positive correlation [$R = 0.763, p = 0.000$] with uptake of antenatal care. In addition, regression analysis indicated an R^2 of 0.819 as shown in Table

8, suggesting that almost 82% of the variability in the uptake of ANC was influenced by reception during ANC visit, adequacy of privacy during ANC service provision and upholding of confidentiality by health workers. This shows that skilled health providers' attitude had a high degree of influence on uptake of ANC.

Table 7: Influence of skilled health providers' Attitude on Uptake of ANC

	Multiple R	R Square	Adjusted R Square	Apparent Prediction Error
Standardized Data	.905	.819	.818	.181

Dependent Variable: Number of ANC visits made

Predictors: Reception during ANC visits, adequacy of privacy & confidentiality.

4.5 Influence of Availability of Community Health Volunteers on Uptake of Antenatal Care

Majority, 231 (60.6%) of mothers know who Community Health Volunteers (CHVs) are, while all, 17 (100%) in-charges also know who CHVs are. In addition, 220 (95.2%) and 184 (88.2%) of the mothers and in-charges respectively, have CHVs within their villages/catchment areas as shown in Figure 4.

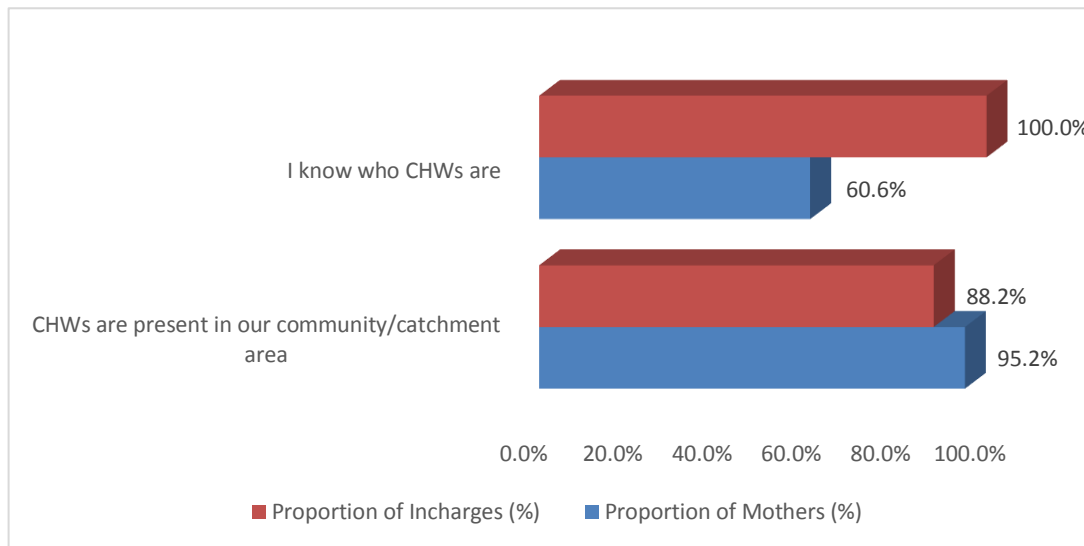


Figure 4: Community Health Volunteers influence on uptake of Antenatal Care

Figure 5 shows that majority, 138 (63%) of the mothers were visited by CHVs 1-3 times

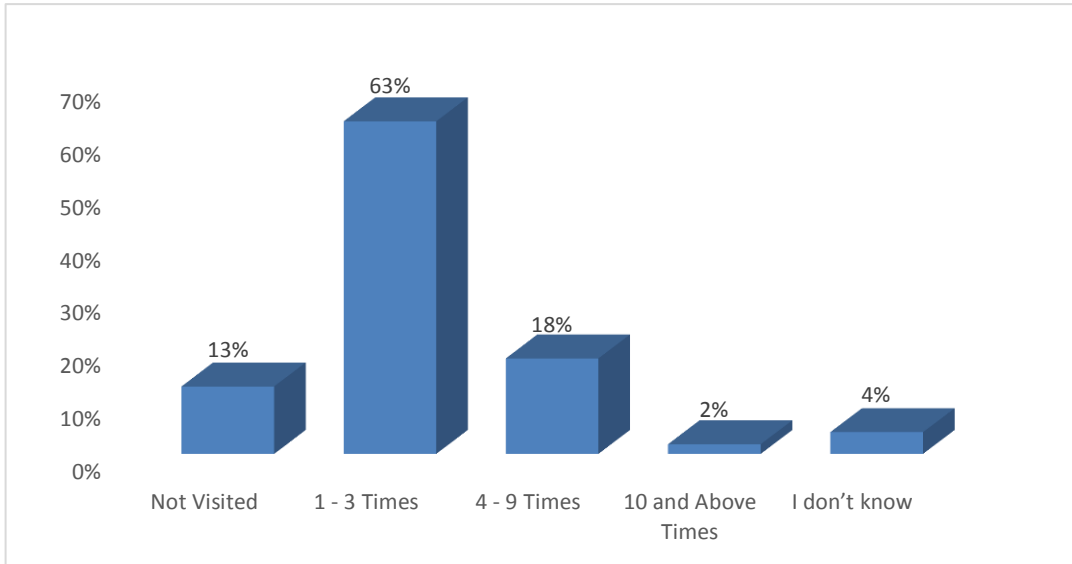


Figure 5: Number of times pregnant mothers were visited by community health volunteers.

Majority, 341 (89.6%) of the mothers affirmed the importance of CHVs. The responses are illustrated in Figure 6.

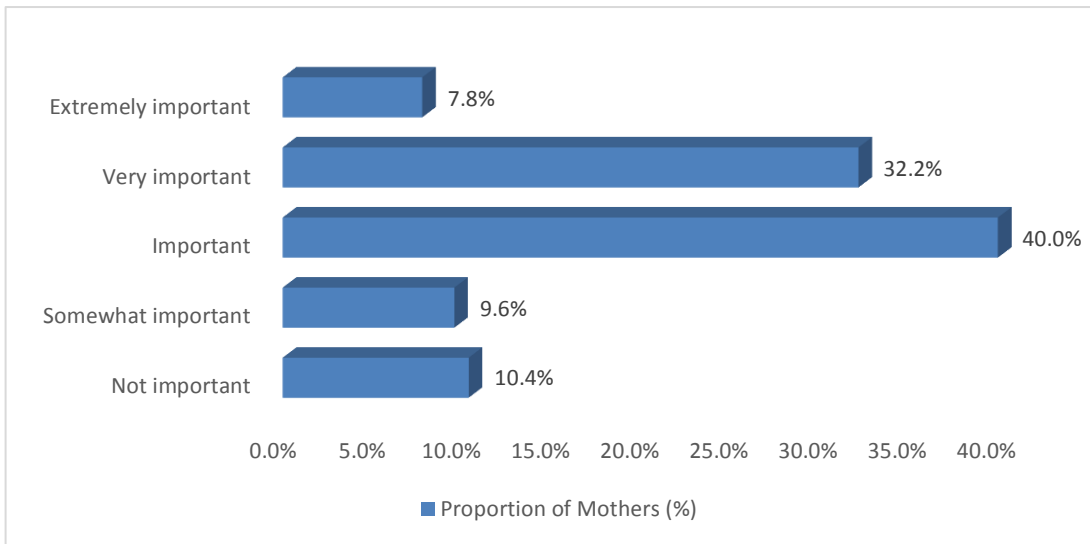


Figure 6: Importance of Community Health Volunteers in improving uptake of Antenatal Care

4.5.1 Relationship between Availability of CHVs and uptake of ANC

Chi-square test and Spearman's correlation test at a significance level of $\alpha=0.05$ indicated that number of CHVs visits had significant association [$X^2 (8) = 317.099, p =$

0.000] and strong positive correlation [$R = 0.870, p = 0.000$] with uptake of ANC, while CHVs perceived importance had significant association [$X^2 (8) = 321.872, p = 0.000$] and strong positive correlation [$R = 0.863, p = 0.000$] with uptake of antenatal care. In addition, regression analysis indicated an R^2 of 0.784 as shown in Table 9, suggesting that almost 78.4% of the variability in the uptake of ANC was influenced by presence of CHVs, number of CHVs visits and CHVs perceived importance. This shows that availability of CHVs had a high degree of influence on uptake of ANC.

Table 8: Influence of Availability of CHVs on Uptake of ANC

	Multiple R	R Square	Adjusted R Square	Apparent Prediction Error
Standardized Data	.886	.784	.781	.216

Dependent Variable: Number of ANC visits made

Predictors: availability of CHVs at the village, number of CHVs visits & CHVs importance in improving uptake of ANC

4.6 Influence of Availability of Skilled Health Providers on Uptake of antenatal Care

Figure 7 shows that 122 (32%) of the mothers spent 30-45 minutes waiting to receive antenatal care services, 115 (30.2%) took between 45-1 hour, 93 (24.4%) spent 1-2 hours and 51 (13.4%) spent over 2 hours.

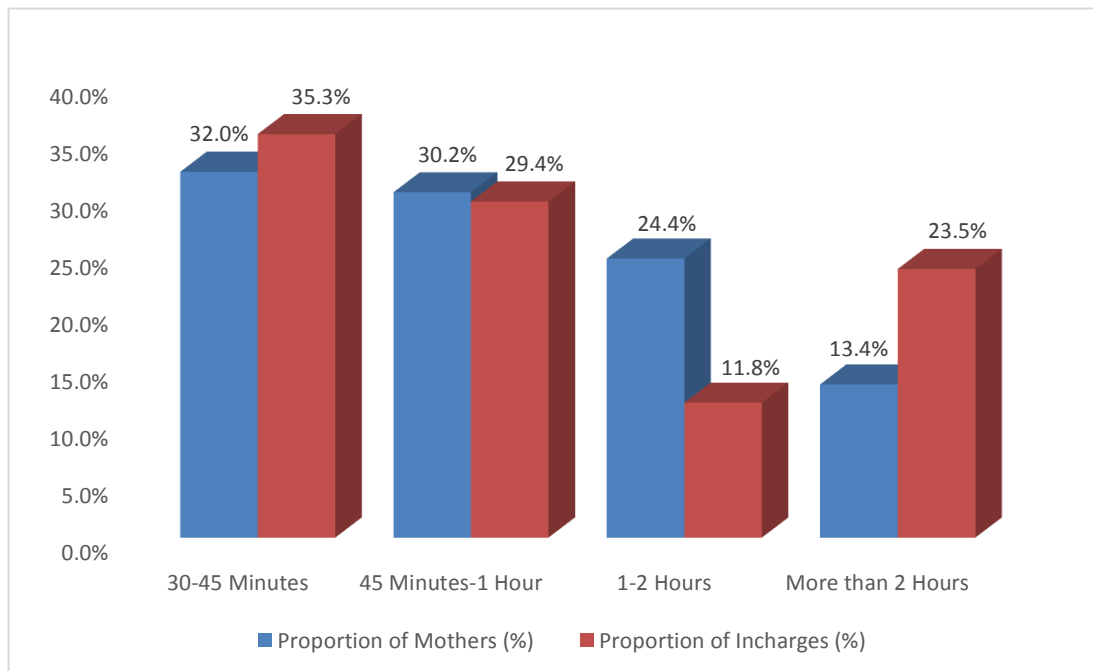


Figure 7: Time taken by pregnant women waiting for antenatal care services

Figure 8 shows that 167 (43.8%) of the mothers found health workers sometimes during their visits to the health facilities, while 156 (40.9%) always found a health worker during their visits.

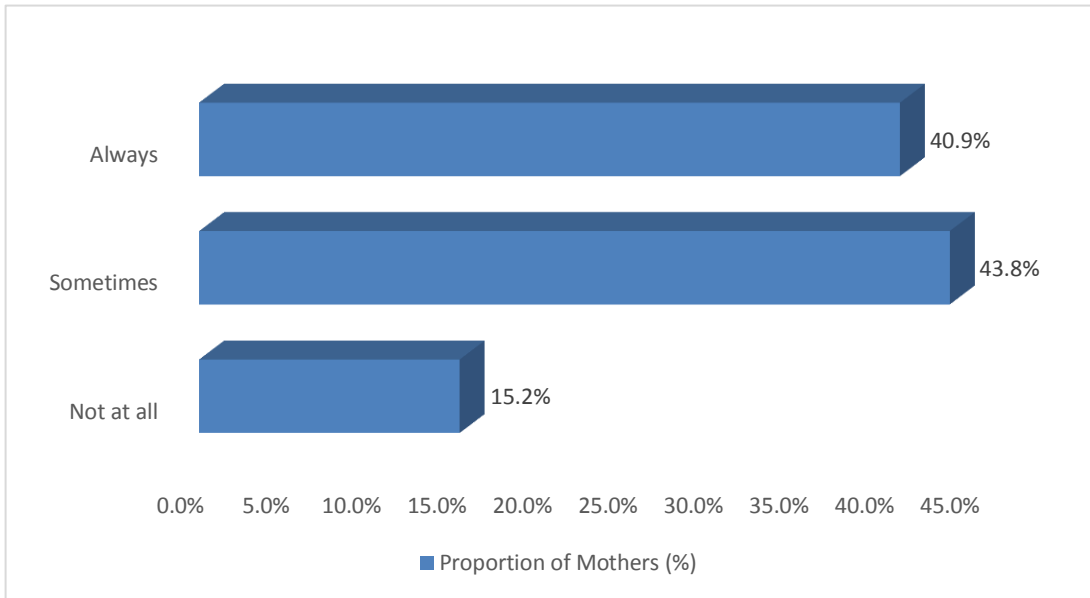


Figure 8: Presence of skilled health providers during ANC visits

Figure 9 shows that majority, 44 (90.3%) of them said health workers spent adequate time while serving them.

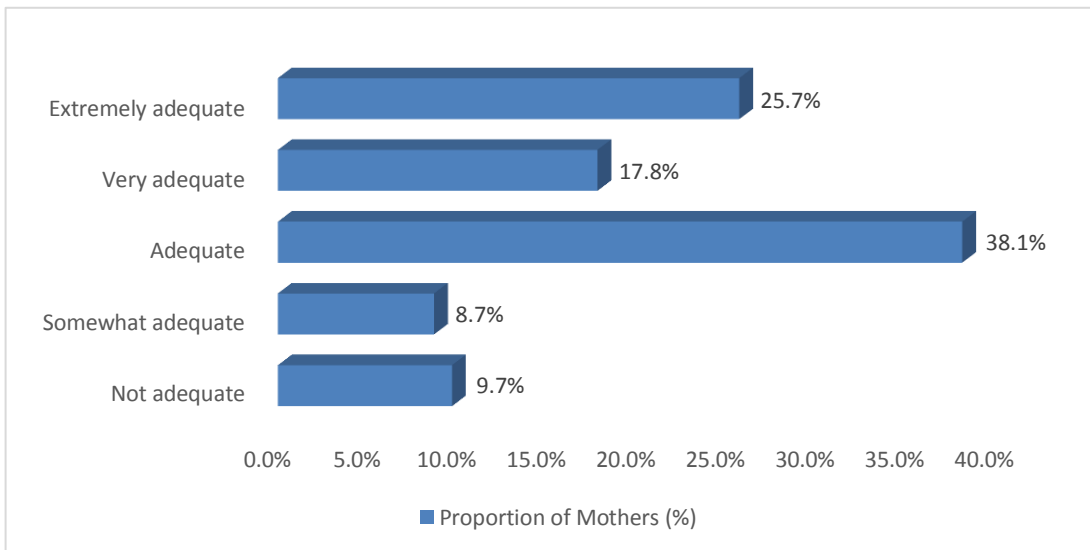


Figure 9: Adequacy of ANC Session Time

4.6.1 Relationship between Availability of Skilled Health Providers and uptake of ANC

Chi-square test and Spearman’s correlation test at a significance level of $\alpha=0.05$ indicated that waiting time had significant association [$X^2(6) = 354.829, p = 0.000$] and strong negative correlation [$R = -0.745, p = 0.000$] with uptake of ANC, while presence of skilled health workers had significant association [$X^2(4) = 668.9, p = 0.000$] and strong positive correlation [$R = 0.947, p = 0.000$] with uptake of antenatal care. The results also indicated that adequacy of ANC session time had significant association [$X^2(8) = 321.872, p = 0.000$] and strong positive correlation [$R = 0.899, p = 0.000$] with uptake of antenatal care. In addition, regression analysis indicated an R^2 of 0.920 as shown in Table 10, suggesting that almost 92% of the variability in the uptake of ANC was influenced by waiting time, presence of skilled health workers and adequacy of sessions. This shows that availability of skilled health providers had a high degree of influence on uptake of ANC.

Table 9: Influence of Availability of Skilled Health Providers on Uptake of ANC

	Multiple R	R Square	Adjusted R Square	Apparent Prediction Error
Standardized Data	.959	.920	.919	.080

Dependent Variable: Number of ANC visits made

Predictors: Time taken waiting to be served, availability of a skilled health worker during ANC visits, adequacy of ANC session time with health worker

5.0 SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of the Study

The study (*Service Delivery Pillar*) was on factors influencing uptake of antenatal care carried out in public health facilities in Taita Taveta County. The general objective of the study was to establish factors influencing uptake of antenatal care among pregnant women. The specific objectives of the study were; to assess the influence of early initiation of antenatal care on uptake of ANC, determine the influence of health care providers’ attitude on uptake of antenatal care, establish the influence of availability of community health volunteers on uptake of antenatal care and explore the effects of staff availability on uptake of antenatal care for pregnant women in the county.

A comprehensive literature review was drawn from theories backing up the study, and past studies related to the factors that influence access to antenatal care. The researcher reviewed several studies globally, regionally and locally. The researcher specifically

reviewed literature on early initiation of antenatal care, health care providers' attitude, community health volunteers and availability of health workers as influencing factors on uptake of antenatal care services

The study adopted survey research design targeting mothers visiting the public health facilities, who had delivered within the last 5 years and did not make at least 4 ANC visits, and the MCH in-charges from the public health facilities. A total of 384 mothers and 18 MCH in-charges were sampled using simple random sampling. The study used structured questionnaires for the mothers and key informant interview for the in-charges. The data collected was analyzed using Statistical Package for the Social Sciences (SPSS) version 23. Descriptive analysis (percentages and frequencies) and inferential analysis (Chi-square test, Spearman's correlation test and regression analysis at a significance level of $\alpha=0.05$) were performed. The results indicated that 166 (43.6%) of the mothers managed 2 ANC visits, 159 (41.7%) made 3 visits and 56 (14.7%) managed to make just 1 ANC visit.

The findings also indicated that timing of ANC initiation had significant association ($X^2 (6) = 102.854, p = 0.000$) and weak negative relationship (Spearman's $R = -0.201, p = 0.000$) with uptake of ANC. An R^2 of 0.071 (7%) showed that early initiation of ANC had a low degree of influence on uptake of ANC. In addition, reception during ANC visits had significant association ($X^2 (8) = 564.235, p = 0.000$) and strong positive relationship (Spearman's $R = 0.905, p = 0.000$) with uptake of ANC; and adequacy of privacy had significant association ($X^2 (8) = 459.447, p = 0.000$) and moderate positive relationship (Spearman's $R = 0.763, p = 0.000$) with uptake of ANC. An R^2 of 0.819 (81.9%) showed that skilled health care providers' attitude had a high degree of influence on uptake of ANC.

Moreover, number of CHVs visits had significant association ($X^2 (8) = 317.099, p = 0.000$) and high positive relationship (Spearman's $R = 0.870, p = 0.000$) with uptake of ANC; and CHVs perceived importance had significant association ($X^2 (8) = 321.872, p = 0.000$) and strong positive relationship (Spearman's $R = 0.863, p = 0.000$) with uptake of ANC. An R^2 of 0.784 (78.4%) showed that availability of CHVs had a high degree of influence on uptake of ANC. Lastly, the results indicated that waiting time had significant association ($X^2 (6) = 354.829, p = 0.000$) and moderate negative relationship (Spearman's $R = -0.745, p = 0.000$) with uptake of ANC; presence of skilled health providers had significant association ($X^2 (4) = 668.9, p = 0.000$) and strong positive relationship (Spearman's $R = 0.947, p = 0.000$) with uptake of ANC; and adequacy of sessions had significant association ($X^2 (8) = 321.872, p = 0.000$) and strong positive relationship (Spearman's $R =$

0.899, $p = 0.000$) with uptake of ANC. An R^2 of 0.920 (92%) showed that availability of skilled health providers had high degree of influence on uptake of ANC.

5.2 Conclusions

The researcher made the following conclusions based on the findings made; knowledge of antenatal care is quite high among pregnant women as well as the healthcare providers in Taita Taveta County, however timely initiation of ANC services is poor. Pregnant mothers managing to start ANC early do not necessarily make 4 ANC visits as recommended by the WHO, therefore timely initiation of ANC services has a minimal contribution towards improved ANC services uptake. Staff attitude, and availability of healthcare providers contribute significantly towards improved ANC uptake among the pregnant women in the County. The healthcare providers' attitude is positive, which is critical in meeting the expectations of pregnant women in the public health facilities. Pregnant women seek for ANC services from a skilled health provider when they have pregnancy complications despite having adequate knowledge of ANC. Community health volunteers play a critical role in the improvement of uptake of antenatal care, pregnant mothers who have been visited by CHVs initiate ANC services at the appropriate time and enjoy the benefits the ANC package offer. Availability of healthcare providers in the right number and mix significantly contribute to improved uptake of ANC, and that waiting time in most of the public health facilities is acceptable among the pregnant women seeking ANC services. However healthcare providers are inadequate and inequitably distributed in most of the public health facilities.

5.3 Recommendations from the findings

Based on the study findings, the researcher recommends that the department of health in Taita Taveta County should conduct regular trainings on customer care for its healthcare workers so as to improve the quality of service delivery to clients. Community awareness on the importance of antenatal care should also be strengthened through daily health talks at the facility level. Furthermore, having established that presence of CHVs influence uptake of ANC, the county government of Taita Taveta should recruit additional CHVs and continue motivating them by offering lunch and transport allowance so that they continue doing regular visits to pregnant women. Lastly, the county government of Taita Tavet should employ additional health workers, deploy them equitably and motivate them so as to continue offering quality ANC services.

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