DETERMINANTS OF MALE PARTNER INVOLVEMENT IN ANTENATAL CARE IN KITUI EAST SUB-COUNTY, KENYA

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Determinants of Male Partner Involvement in Antenatal care in Kitui East sub-County, Kenya

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University

Signature……..Date…….

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This thesis has been submitted for examination with our approval as the University Supervisors

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DEDICATION

I dedicate this thesis to my husband Daniel for his support and to my children Leroy and Tara for giving me an easy time when I was working on it.

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ABBREVIATIONS AND ACRONYMS

ANC	Antenatal Care
CHAs	Community Health Assistants
CHWs	Community Health Workers
HIV	Human Immunodeficiency Virus
KDHS	Kenya Demographic and Health Survey
KNBS	Kenya National Bureau of Statistics
MMR	Maternal Mortality Rate
MPI	Male Partner Involvement
MS	Microsoft
NACOSTI	National Commission for Science, Technology and Innovation
PMTCT	Prevention of Mother to Child Transmission
SBA	Skilled Birth Attendants
SDG	Sustainable Development Goals
SPSS	Statistical Package for Social Science
WHO	World Health Organisation

ABSTRACT

Male partner involvement in antenatal care has been a challenge globally over the years despite previous research evidence having shown that their involvement results in improved maternal outcomes. For instance, in Kenya where maternal mortality rate is 362 per 100,000 live births, only 1 out of 4 men accompany their spouses to the antenatal clinic. However, there is lack of information concerning factors influencing male partner involvement in ANC. The main objective of this study was to establish the determinants of male partner involvement in ANC in Kitui East sub-County. A cross sectional study design utilizing quantitative methods was adopted. Probability sampling method (stratified at ward level and simple random at household level) was used to reach a sample of 297 households. In each household, data was collected by use of questionnaires after the researcher gained informed consent. The study population was men aged 18 years and above whose female partners had given birth in the past 12 months. Collected data were entered and analysed in SPSS version 24. Both descriptive and inferential analyses statistics were calculated. The results indicated that overall, more than half (61%) of the participants were involved in ANC. Factors including age of the participant, number of children, pregnancy planning, previous ANC experience, awareness of ANC and financial decision making significantly ($P<0.05$) influenced male involvement. This study concludes that empowering men with knowledge on ANC specifically awareness of the danger signs during pregnancy, the antenatal profile and the required minimum number of ANC visits is imperative in order to improve male involvement.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Over the years, male partner involvement in antenatal care has been wanting globally raising public health concern (Mackert *et al.,* 2015). Antenatal care (ANC) is defined as the care provided by skilled healthcare professionals to pregnant women and adolescent girls to ensure the best health conditions for both mother and baby during pregnancy (WHO, 2016). It is a fundamental component of maternal healthcare that encompasses a series of healthcare visits and interventions aimed at monitoring the progress of pregnancy, promoting the wellbeing of both the mother and the unborn child and identifying and managing potential complications. Antenatal care has been shown to improve pregnancy outcomes by reducing maternal mortality. The demand for male partner involvement in ANC has been reported in developed countries. In the United States, only a few studies have been done which focus on men's involvement in ANC, instead most previous researches focused almost entirely on interventions amongst women that aimed at improving maternal and child health outcomes (Bond, 2010). In a review of 3 studies on first time expectant mothers investigating methods for including men in ANC education in Turkey, Mackert *et al.* (2015) established that pregnant women demand to have their husbands actively involved in ANC.

Low partner involvement in ANC has also been recorded in medium-low income countries including Asia (Ampt *et al.,* 2015) and India (Bhatta, 2013). In a cross-sectional study conducted among 2,178 married men on their involvement in ANC in Kathmandu, Nepal, Bhatta (2013) found that only 39.3% accompanied their partners to ANC. Further, in a study carried out on 210 men in Asia on male involvement in maternal and new born health, Ampt *et al.* (2015) reported that at least 36% were not actively involved. Countries in Africa that account for the bulk of maternal deaths have correspondingly low levels of male partner involvement. For instance, in a study conducted in Malawi amongst 476 women enrolled in a PMTCT program,

Kalembo *et al.* (2013) found that 9 out of 10 (86.3%) women had no male partner active involvement during their ANC.

Low male partner active involvement in ANC has also been recorded in sub-Saharan African countries like Ethiopia (Ayalew *et al.,* 2020) and Uganda (Alupo *et al.,* 2020). In an Ethiopian study on determinants of male partner involvement towards prevention of mother-to-child transmission of HIV/AIDS service utilization amongst 420 pregnant women, found that the proportion of male partner involvement was 29.8% (Ayalew *et al.,* 2020). Further, a study conducted in Uganda amongst 195 adult men on male partner involvement in utilization of ANC services found that only 9.6% of the men accompanied their spouses to the ANC for at least 4 visits (Alupo *et al.,* 2020). Locally, Kenya has also recorded low male partner involvement in ANC (Aluisio *et al.,* 2016). In a prospective cohort study conducted in Nairobi, Kenya, amongst women attending ANC, Aluisio *et al.* (2016) found that only 1 out of 4 (26%) men accompanied their spouses to the ANC.

Whereas previous studies conducted in the region focused mostly on male partner physical attendance, they omitted the emotional, financial and decision-making support men gave to their expectant women. Control of finances, physical support, emotional support, and decision-making influence expectant women's access to ANC service (Kabakyenga *et al.,* 2012). In Sub-Saharan Africa specifically in Kenya, no study has been published on the different types of support men provide their expectant spouses. The purpose of the current study was to fill this gap. It aimed at establishing the determinants of male partner involvement in ANC on four domains, that is, physical support, financial support, psychosocial support and decision-making. This is essential because researchers have shown that male partner involvement in ANC results in improved maternal outcomes in developing countries (Suandi *et al.,* 2020). For instance, in a systematic review and meta-analyses of published literature from low and middle income countries to find out whether involving male partners in ANC improve health care utilisation, Suandi *et al.* (2020) found that male involvement in ANC had a positive impact on the uptake of maternal health services thus improved maternal and new born health outcomes.

1.2 Statement of the problem

Pregnancy is a highly vulnerable period for women and their unborn babies (Mwilike *et al.,* 2018; Sageer *et al.,* 2019). Therefore, access to ANC services is critical in ensuring women receive skilled care that will mitigate against any complications, and ultimately contribute towards reversing the alarmingly high maternal mortality rate, especially in sub-Saharan Africa (WHO, 2016, 2019). Male partner involvement in reproductive, maternal and new born health has been associated with improved maternal and child health outcomes (Chibwae *et al.,* 2018).

The consequences arising from the lack of male partner involvement in ANC include increased maternal mortality rate. Maternal mortality remains a major concern in the Kenyan society. The KDHS 2014 report showed that Kenya has a maternal mortality rate (MMR) of 362 per 100,000 live births. In Kitui County alone, the KDHS 2014 report recorded 468 deaths per 100,000 live births. Previous studies conducted in other developed countries show that preventable maternal deaths are primarily a function of delays in seeking care; reaching health care facilities and getting appropriate care although the first two delays are avertable person and/or family-related factors (Shah *et al.,* 2020). In many low and middle income settings, men are breadwinners and key decision makers (Peneza & Maluka, 2018; Yargawa & Leonardi-Bee, 2015), hence their involvement is critical in eliminating key barriers that women face which contribute to the first two major delays in accessing quality maternal care (Mgawadere *et al.,* 2017; Shah *et al.,* 2020; Sk *et al.,* 2019).

In light of the high rates of MMR, it is evident that male partner involvement in ANC could contribute to safer pregnancies and reduced MMR and therefore the need to generate baselines on the proportion of men involved in ANC and the factors that influence their involvement.

1.3 Justification of the study

Despite the critical importance of male partners during pregnancy, there is paucity of information on the impact of supports men provide for their spouses (women) ANC in Kenya. In addition, previous studies have paid little attention to factors influencing

male partner involvement in ANC. If not addressed, the maternal loss, which is more than twice the global average, occasioned by lack of male partner involvement in ANC, may cause Kenya to lag behind her neighbours in the Sustainable Development Goal 3 (SDG 3). Further, there is no data to show the proportion of male partners involved in ANC in Kitui East sub-County yet the KDHS 2014 report recorded 468 deaths per 100,000 live births in Kitui County alone. This study aimed to determine the factors influencing male partner involvement in antenatal care in four domains that is, physical support; financial support; psychosocial support and decision making. The study established an empirical baseline data that is comparable to those of other countries in the region and beyond. The data obtained forms a useful baseline for practitioners in ANC and allied health and may assist in the development of model programs to mitigate poor maternal outcomes. Recommendations from this study can as well be adopted by program implementers to design and implement targeted interventions for improving male partner involvement in ANC. The evidence can inform policy and planning for services at National and County levels to increase male involvement towards reducing the high MMR. The study also contributes to the global body of knowledge on the determinants of male partner involvement in ANC. The findings of this study will go a long way in assisting Kenya to realise its developmental goals, and more specifically SDG 3 that focuses on reducing the global maternal mortality rate to less than 70 per 100 000 live births.

1.4 Research Questions

1. What is the proportion of male partners involved in ANC of their spouses in Kitui East sub-County?
2. What is the male partners' awareness of ANC and attitude towards involvement in ANC in Kitui East sub-County?
3. What are the socio-cultural factors influencing male partner involvement in ANC in Kitui East sub-County?
4. What are the health services' related factors influencing male partner involvement in ANC in Kitui East sub-County?

1.5 Objectives of the study

1.5.1 General Objective

To establish the determinants of male partner involvement in ANC in Kitui East sub-County

1.5.2 Specific Objectives

1. To determine the proportion of male partners involved in ANC of their spouses in Kitui East sub-County
2. To assess the male partners' awareness of ANC and attitude towards involvement in ANC in Kitui East sub-County
3. To establish the socio-cultural factors influencing male partner involvement in ANC in Kitui East sub-County
4. To determine health services' related factors influencing male partner involvement in ANC in Kitui East sub-County

CHAPTER TWO

LITERATURE REVIEW

2.1 Proportion of male partner involvement

Previous studies indicate that male partner involvement in antenatal care is still a challenge. For instance, in a study conducted among 210 men in Myanmar Asia on male involvement in maternal and new born health, Ampt *et al.* (2015) reported that at least 36% of them were not actively involved. Further, in a cross-sectional study conducted among 2,178 married men on involvement of males in ANC in Kathmandu, Nepal, Bhatta (2013) found that only 39.3% of them accompanied their partners to ANC. In Africa, in a study conducted in Johannesburg, South Africa among 150 women on acceptability and preferences among men and women for male involvement in ANC, Yende *et al.* (2017) reported that only 14% of men accompanied their partners to the ANC. Additionally, in a study conducted in Malawi amongst 476 women enrolled in a PMTCT program, Kalembo *et al.* (2013) found that 9 out of 10 (86.3%) women had no male partner active involvement during their ANC.

Low male partner active involvement in ANC has also been recorded in Sub-Saharan African countries like Ethiopia (Ayalew *et al.,* 2020) and Uganda (Alupo *et al.,* 2020). In an Ethiopian study on determinants of male partner involvement towards prevention of mother to child transmission service utilization amongst 420 pregnant women, Ayalew *et al.* (2020) found that the proportion of male partner involvement was 29.8%. Further, in a study conducted in Uganda amongst 195 adult men on male partner involvement in utilization of ANC services Alupo *et al.* (2020) found that only 9.6% of the men accompanied their spouses to the ANC for at least 4 visits. Locally, Kenya has also recorded low male partner involvement in ANC (Aluisio *et al.,* 2016). In a prospective cohort study conducted in Nairobi, Kenya, amongst women attending ANC, Aluisio *et al.* (2016) found that only 1 out of 4 (26%) of men accompanied their spouses to the ANC. There is no data on male partner involvement in Kitui.

2.2 Determinants of male involvement

2.2.1 Socio-demographic factors

Some individual socio-demographic factors have been associated with the non-involvement of men in the ANC activities (Kariuki & Seruwagi, 2016; Tilahun & Mohamed, 2015). In a study conducted amongst 384 men whose spouses were attending ANC in Wakiso, Uganda on determinants of male involvement in ANC, Kariuki & Seruwagi (2016) found that men aged 25 years and over demonstrated greater involvement than those aged below 25 years. Further, in an Ethiopian community-based study amongst 720 men whose spouses had given birth 12 months prior to the study, Tilahun & Mohamed (2015) found that older men are keener on providing for their families and are highly likely to accompany their partners to ANC compared to the younger men.

Besides age, marital status and level of education have also been shown to influence male partner involvement in ANC (Amano & Musa, 2016; Ampt *et al.,* 2015). In a cross-sectional study carried out amongst 210 men in Myanmar Asia on male partner involvement in maternal and newborn health, Ampt *et al.* (2015) found that men in monogamous or those cohabiting with their female partners were highly likely to be involved contrary to their counterparts. Additionally, in a study conducted among 802 men in Gondar, Ethiopia on factors associated with male partner involvement in PMTCT, Amano & Musa (2016) found that men with low level of education are most unlikely to participate in PMTCT activities contrary to those with higher level of education.

Low pay is another factor that influences men's participation in ANC (van den Berg *et al.*, 2015). In a South African study to assess men participation in preventing mother to child transmission of HIV, van den Berg *et al.* (2015) found that financially stable men were more likely to visit ANC with their partners and pay for un-planned services in contrast to individuals who have low or no source of income.

2.2.2 ANC Awareness and Attitude

Research evidence has shown that knowledge of ANC amongst men may influence the extent to which individuals are exposed to ANC activities (Kabanga *et al.,* 2019; Nanjala & Wamalwa, 2012). In a cross sectional study amongst 380 male partners and their spouses, Nanjala and Wamalwa (2012) found that lack of knowledge among male partners regarding complications associated with pregnancy and delivery contributed to low male partner involvement in ANC. Further, in a study conducted in Kyela District, Tanzania on prevalence of male partner involvement in antenatal care visits among 174 pregnant women, Kabanga *et al.* (2019) found that lack of awareness of ANC services among their spouses was found to be one of the reasons for low involvement.

Although men may show interest and concern about their wives and unborn baby's health, their lack of knowledge on danger signs is a significant barrier to their participation (Kabakyenga *et al.,* 2012). In a study conducted amongst 759 women to assess the influence of birth preparedness and decision making on location of birth and assistance by skilled birth attendants among women in South Western Uganda, Kabakyenga *et al.* (2012) found that the lack of knowledge amongst men concerning pregnancy-related complications and requirements makes them withhold support from their spouses during pregnancy.

Previous studies have shown that men at times generally have negative attitudes towards certain issues and views which in turn hinder them from participating in ANC-related activities (Kariuki & Seruwagi, 2016; Nkuoh *et al.,* 2013). In a study conducted in Wakiso District, Uganda on determinants of male partner involvement in antenatal care, Kariuki & Seruwagi (2016) found that majority of men viewed ANC as being a place for "females" and felt embarrassed being in such places. The community in which an individual resides can also influence their attitudes and behaviour. Further, in a study conducted in Cameroon on barriers to men's participation in antenatal and prevention of mother to child HIV transmission, Nkuoh *et al.* (2013) found that men generally avoid being teased or ridiculed when participating or being supportive of their wives.

2.2.3 Socio-cultural factors

Norms and taboos mainly associated with African societies where there is a misconception that ANC is a women affair can affect the participation of men in ANC activities (Asefa *et al.,* 2014). Men may be more inclined to participate in ANC if they see their peers doing the same or if community leaders endorse and advocate for male involvement. In a cross-sectional study conducted in Harare, Ethiopia, amongst 385 women attending ANC, Asefa *et al.* (2014) found that lack of male partner involvement in ANC is associated with the fact that men shy away from accompanying their spouses to ANC because the community will view them as weak. In many societies, gender norms and expectations have traditionally positioned pregnancy and childbirth as primarily women's domain thus hindering men from getting involved. In a study conducted in Tanzania on perception of male involvement in pregnancy and childbirth, Maluka & Peneza (2018) found that traditional gender roles at home as well as some cultures portraying men visiting the ANC with women as being weaklings influenced male involvement. In essence, such cultures make men not to be involved with issues related to attending ANC as they are meant to be visited by women.

2.2.4 Health care system related factors

Researchers have demonstrated that health care system factors also influence men's visits to ANC with their spouses (Alupo *et al.,* 2020; Tweheyo *et al.,* 2010). In a study conducted in Gulu, Uganda on male partner attendance of skilled ANC, Tweheyo *et al.* (2010) found that men who live far from the health facility are more likely not to accompany their partners to the ANC compared to those who live close to health facilities. Further, in a study conducted in Uganda amongst 195 adult men on male partner involvement in utilization of ANC services, Alupo *et al.* (2020) found that couple friendly infrastructure that ensures privacy may improve male partner involvement.

The health workers can also encourage or discourage male involvement depending on the way they handle their clients, in that, harsh language and aggressive behaviours not only discourage women from participating from ANC but also their

male partners (Ditekemena *et al.,* 2012; Kariuki & Seruwagi, 2016; Matseke *et al.,* 2017). For instance, in a study conducted in Wakiso District, Uganda on determinants of male partner involvement in antenatal care Kariuki & Seruwagi (2016) found that health worker's attitude, waiting time and cost of the ANC services offered was significantly associated with male partner involvement. In addition, in a study conducted in South Africa on meaning and understanding of male partner in pregnancy related care, Matseke *et al.,* (2017) found that health workers who roughly handle pregnant women and those who restrict men from certain clinic settings discourage men from attendance. In such instances, men feel disrespected, unwelcomed and that the services are not designed to include and encourage their participation. Further, in a systematic review (of 34 studies) to establish the determinants of male partner's involvement in maternal and child health services in Sub-Saharan Africa, Ditekemena *et al.* (2012) found that health system-related factors such as opening hours of health facility, behaviour of the health providers and lack of space at the facility influence men involvement.

There are times where the hospitals may charge unofficial fees that may discourage the participation of men (Nanjala & Wamalwa, 2012). In a survey of determinants of male partner involvement in promoting deliveries by skilled attendants conducted in Busia County, in Kenya, amongst 380 couples (male partners and their spouses), Nanjala & Wamalwa (2012) found that high fee for ANC services prevent men from getting involved to avoid being embarrassed should they lack the funds to cater for the services. On the other hand, longer waiting periods in health facilities and/or a smaller workforce makes it increasingly difficult for men to wait for their spouses (Shahjahan *et al.,* 2013). In a study conducted in Bangladesh amongst 615 men Shahjahan *et al.* (2013) found that majority of the men would rather not accompany their partners to ANC because of the waiting time.

The ANC is usually composed of women and in most instances their male partners find the space unfriendly and there is usually insufficient space. A facility that offers male friendly services and care that is all round motivates male partners to be involved in seeking services in the facility (Gracia, 2014). In a study conducted in Spain on fathers' childcare involvement and children's age, Gracia (2014) found that

health clinics that are mainly dominated by women put off men from attending the facilities while in facilities with some male health workers, men are active and increase their participation in both counselling and check-up activities for the wellbeing of the partner and their child.

2.3 Conceptual framework

This framework describes various ways in which a male partner can be involved in antenatal care and some of the factors that make a male partner be/not be involved in antenatal care. There are four different aspects highlighted in which a male partner can offer support to his spouse during pregnancy thus indicating his involvement. These four ways are physical support, financial support, psychosocial support and support in decision-making. Most of the previous researches have focused more on the physical support that entails the male partner accompanying the spouse to the antenatal clinic. However, this study looked at the four aspects of the support.

For a male partner to give either of the support mentioned, there are some factors that will determine. These include awareness of antenatal services or lack of it in the case of the male partner; sociocultural factors like beliefs and taboos; health services related factors like waiting time, attitude of the health care workers; and individual socio demographic factors such as age, level of education and income level. How these factors can influence male partner support, whether physical, financial, psycho-social or support in decision making may be a function of his knowledge interaction with various factors (see figure 2.1).

Independent Variables ……...Dependent Variable

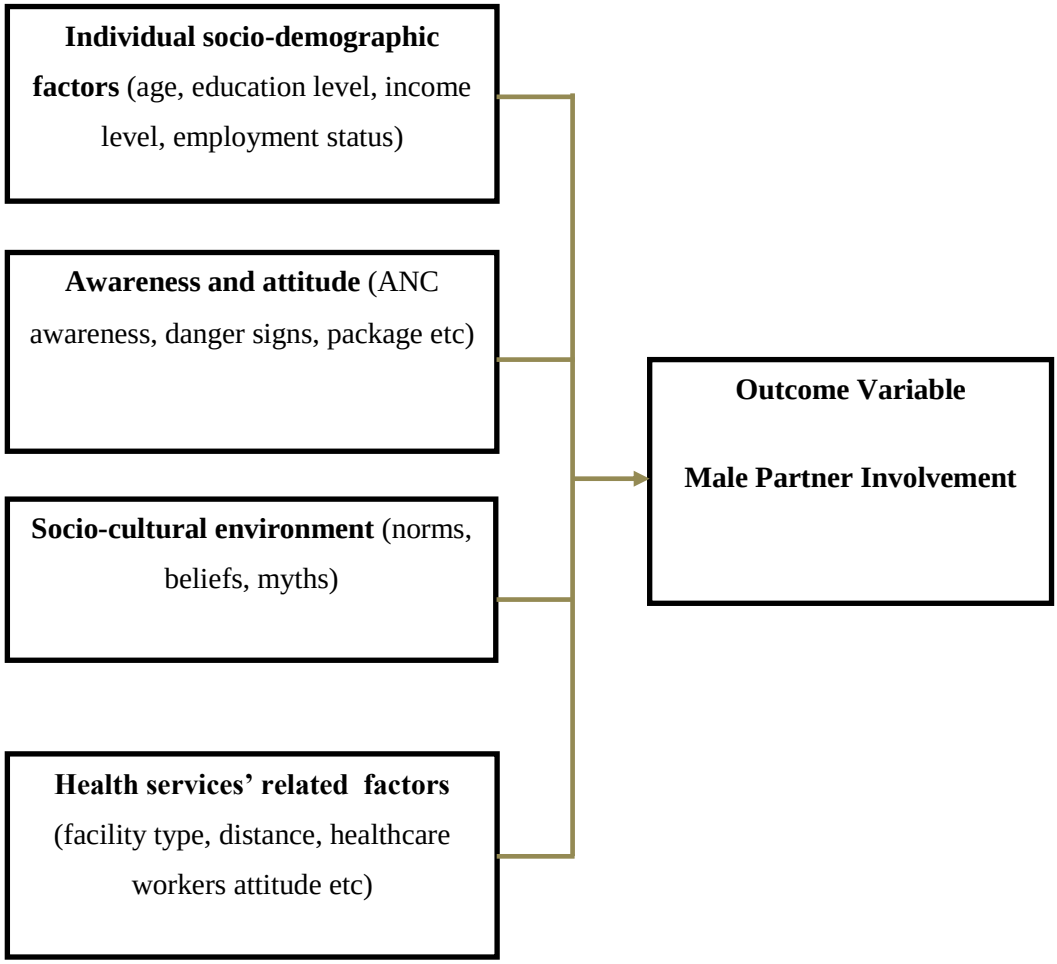

Figure 2.1: Conceptual Framework

CHAPTER THREE

MATERIALS AND METHODS

3.1 Study Design

This study was an analytical cross-sectional study utilizing quantitative methods to establish the determinants of male partner involvement in antenatal care. A cross-sectional study is a type of observational study that involves collecting and analysing data from a population or a representative subset at a specific point in time (Levin, 2006).

3.2 Study Area description

This study was carried out in Kitui East sub-County. This is one of the eight sub counties in Kitui County (see appendix 7). Kitui East sub-County has approximately 17,143 households (KNBS, 2015). The main economic activity in Kitui East sub-County is farming though it is an extremely challenging endeavour due to the sporadic rainfall. The poverty level in Kitui County is 63.1%. Kitui East sub-County was chosen because it is one of the sub-Counties with low ANC coverage (62% vs 63.6% for the County) and low skilled delivery coverage (73.6% vs 78.3% for the County). In addition, Kitui County MMR is high (468 deaths per 100,000 livebirths) compared to the national MMR (362 deaths per 100,000 livebirths.

3.3 Study Population

The study population were men above 18 years whose female partners had given birth 12 months prior to the study. According to 2019 census, the population of men in Kitui County is 48% of the entire population of 1,136,187. The percentage of women of child bearing age attending ANC is 62%.

3.3.1 Inclusion Criteria

Men aged 18 years and above whose female partners had childbirth within 12 months prior to the study. Only eligible men residing in Kitui East sub-County who gave written consent were included in the study.

3.3.2 Exclusion Criteria

Those who had communication and cognitive difficulties were excluded.

3.4 Sampling

3.4.1 Sample Size Determination

The sample size for this study was derived using Cochran's formula with precision /absolute error of 5% and type 1 error of 5% (Rosner, Bernard, 2010).

$$n = \frac{Z_{1-\alpha/2}^{2} p(1-p)}{d^{2}}$$

Where;

n = the desired sample size.

$Z_{1-\alpha/2}$ =the standard normal variate (at 5% type 1 error, P<0.05) =1.96

p = is the estimated proportion of male participation in ANC found in a previous study (Aluisio *et al.*, 2016).

d= is the absolute error or precision-decided by researches usually 5%.

Therefore, the sample size was;

$$\frac{(1.96)^2 x (0.262) x (0.738)}{(0.05)^2}$$

= **297** respondents

3.4.2 Sampling Method

Sampling was done in two stages- at the ward level and at the household level Stratified sampling was used to sample the wards dividing them to 2 strata (peri urban and rural) then randomly selecting 1 peri-urban ward out of 2 and 2 rural wards out of 3 to give a total of 3 wards. Households were randomly selected. The sampling frame was all the approximately 17,143 households in Kitui East sub-County. The sampling proportion was derived from KDHS 2014, where there were 438 live births from 850 households in the five-year period; translating to approximately 90 births per year; which translates to one reported birth per 10 households. The sampling proportion was applied to the sample size of 297 to arrive at 2,970 households from which participants would be recruited. The researcher equally distributed the 2,970 households across the 3 wards (990 households per ward). All community units (18) within the 3 wards were identified and then randomly selected 990 households from the household registers. Community Health Workers from the community units covering the selected households were engaged to help identify households with eligible participants and mapped them. They then guided the data collection team to the selected households. Once in the households the head of the household was identified and consent for the study sought. Thereafter data was collected. The data collection team repeated this in every household until the sample size was achieved.

3.5 Data Collection

Data was collected using interviewer administered questionnaire administered by trained research assistants to the eligible male respondents.

3.5.1 Data collection instrument

A structured questionnaire was used to collect data. The questionnaire was subdivided into 9 parts. Part 1 comprised 15 questions on demographic information; part 2, had 14 questions on physical support of male partner on antenatal care; part 3,

had 7 questions on psychosocial support; while part 4, had 6 questions on decision making. Part 5, had 6 questions on financial support; while part 6, had 15 questions on awareness of ANC; and part 7, 8 questions on attitude. Further, part 8, had 8 questions on social and cultural norms; and part 9, had 15 questions on health system factors.

3.5.2 Validity and Reliability of the instrument

Throughout the construction of the instrument, the researcher continuously consulted experts in the area of the study. In addition, the questionnaire was pretested on 15 respondents with similar characteristics residing in Kitui Central Sub-County. The respondents had no difficulties with the questions and appreciated its layout. The questionnaire took them on average 30 minutes to complete.

A reliability test done for socio-cultural norms scale calculated an overall Cronbach's alpha of .848 showing that the items had high internal consistency. All items in the scale were therefore retained (see Table 3.1).

Table 3.1: Socio-cultural items scale's Cronbach's alpha

Socio-Cultural Norms	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Childbearing is a women's affair and does not require the husband's participation	24.16	39.79	0.64	0.823
Antenatal care is women's business and a man should not have to worry about it	24.03	39.02	0.69	0.817
Fear of being tested for HIV hinder accompanying wife to the clinic	24.09	43.36	0.52	0.838
Bad omen for men to escort their pregnant women to hospital for antenatal check ups	23.58	43.88	0.51	0.839
Male friends think pregnancy and child birth is women's business	24.15	40.91	0.67	0.819
Being viewed as less of a man if seen escorting pregnant wife to hospital	24.02	40.81	0.70	0.816
Religious beliefs affect decisions on antenatal care	23.04	48.57	0.38	0.851
Traditional and cultural beliefs in community affect decision on antenatal care	23.44	43.45	0.57	0.832
Cronbach's Alpha				**0.848**

On doing a reliability test, all items on the scale to determine attitude towards male partner involvement in ANC were retained with an overall Cronbach's alpha of .812, indication that the items had high internal consistency (see table 3.2).

Table 3.2: Socio-cultural items scale's Cronbach's alpha

Attitude	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Pregnancy is a risky period for the mother's health	17.79	23.84	0.58	0.785
It is important for a pregnant woman to go for Antenatal check-up	19.15	29.30	0.48	0.801
When a woman is pregnant, it is her responsibility to go to the clinic (R)	17.17	28.00	0.45	0.804
Interested in knowing more about ANC	18.74	27.73	0.58	0.786
Men share the responsibility of antenatal care with their wives	18.08	24.25	0.71	0.757
Men should accompany their wives to the clinic when they are pregnant	17.68	23.56	0.67	0.765
Men feel embarrassed accompanying their wife to the antenatal clinic (R)	17.65	26.99	0.44	0.806
Cronbach's Alpha				**0.812**

On doing a reliability test, all items in the scale for health services related factors were retained as they were found to have high internal consistency with an overall Cronbach's alpha of .893 (see Table 3.3).

Table 3.3: Health Services Scale's Cronbach's Alpha

Health Services Factors	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Slow service provision and long waiting hours.	28.39	45.89	0.63	0.885
Lack of privacy and crowded waiting bay and counseling space.	29.06	50.48	0.47	0.896
Service providers rude and unfriendly	28.01	47.09	0.68	0.878
Offered sufficient consultation time and received sufficient information	27.90	48.18	0.81	0.871
Given the opportunity to ask questions and clarify doubts during consultation	27.94	46.12	0.82	0.867
Opinions taken into consideration	28.13	50.44	0.58	0.886
Treated respectfully and not judged by staff	28.10	48.29	0.68	0.878
Given priority because of accompanying wife	29.12	48.97	0.54	0.890
Motive for visit addressed and the medical care received satisfactory	27.87	48.64	0.77	0.873
Cronbach's Alpha				0.893

3.5.3 Recruitment and Training of Research Assistants

Prior to data collection, the principal researcher conducted training of research assistants. The training covered purpose of the study, eligibility criteria, study methodology and sampling procedure. A detailed question by question review of the questionnaire with role plays was done to ensure an in-depth understanding of study tool. In addition, ethical considerations in research involving human subjects including consenting procedures by respondents was covered.

3.5.4 Data collection procedure

The research assistants were led to the mapped households by the CHWs. Once at the household, they identified the head of the household, sought consent and thereafter administered the questionnaire.

3.6 Data Management and analysis

Collected data was entered into MS-Excel software twice and descriptive statistics calculated using SPSS version 23.0 to check for errors. Any errors noted were corrected by re-entering data from individual questionnaires. Once data entry was corrected, descriptive analyses was employed to analyse data on; socio-demographic characteristics, ANC awareness and attitude, socio-cultural norms and health system factors. The association between male involvement and other variables were estimated using bivariate logistic regression, which were first fitted to identify potential predictors and confounding factors. Variables with a *p*-value <0.05 were entered to generalized linear models using logit link to identify independent predictors of male involvement. Adjusted odds ratio with its 95% confidence interval was calculated to report the strength and significance of the association. All tests were two sided and statistical significance was set at $p = <0.05$.

The researcher identified twelve (12) questions that directly measured male involvement in antenatal care from the four major domains of male involvement; physical support, psycho-social support, decision making support and financial support (See Appendix 5). The respondents answered either “yes” or “no” in all questions except for 2 questions on decision making where if either the man or both partners made the decision it was coded as 1 or else it was coded as 0. For all other questions “Yes” was coded as 1 “No” as 0.

Data reduction techniques were used to summarize the observed male involvement variables into few dimensions through latent variable modeling using the "eRm” (Mair & Hatzinger, 2007), "ltm” (Ltm, 2006), and "difR” (Magis *et al.*, 2020) R package. Component internal consistency and reliability used to calculate male involvement scores were assessed by calculating Cronbach’s alpha (α), which was found to be 0.913 (95% C.I, 0.896-0.926).

Pairwise associations between the 12 items for all possible pairs were computed and all variables were found to be significantly positively correlated to each other, hence all items were retained. Factor scores were then generated by fitting a one parameter logistic regression model, also known as the Rasch model. The scores had a bimodal

negatively skewed distribution, suggesting that there were two groups. Respondents scoring less than zero were classified as “not-involved” while those with more than zero were classified as “involved”. Each participant needed to score a 1 in at least 9 of the 12 items (75% and above).

3.7 Ethical Considerations

Ethical clearance to conduct the study was granted by the JKUAT Ethical Review Committee-Reference number: JKU/2/4/896B (see appendix 1) and a research permit received from the National Commission for Science, Technology and Innovation (NACOSTI)-Reference number: 314480 (see appendix 2). Informed written consent was obtained from potential study participants before commencement of data collection (see appendix 4). During the consenting process, the research assistants explained the objectives and purpose of the study. Additionally, the potential participants were explained that their participation would be entirely voluntary and they could opt out of the study willingly without any prejudice. The potential participants were assured that their anonymity and confidentiality would be maintained throughout the research process. Further, data collection was conducted in settings that guaranteed audio privacy. There were no direct benefits to participants in this study, other than the overall findings from this study being used to improve services delivery in order to encourage male partner involvement in antenatal care.

The data collection team also informed the respondents that there were no risks that were likely to occur from their participation other than probably feeling embarrassed and uncomfortable discussing their sensitive information with the study team. In mitigation, participants were invited to disclose when they experience discomfort during the study or they could opt-out of answering questions that made them uncomfortable or withdraw from the study.

3.8 Study Limitations

This study had several limitations. First, this study only interviewed male respondents, and did not interview their spouses to corroborate the information

reported. There is a likelihood of social desirability bias from some of the respondents who may have wanted to appear more involved than they actually had been. Secondly, the study is likely to have suffered from recall bias since we sampled participants whose spouses had given birth twelve months prior to the study, and they may have forgotten details of their experiences. Finally, Kitui East sub-County is geographically large with a small urban section of the sub-County being densely populated, while rural forms the larger section that is sparsely populated. While we attempted to account for this through stratified sampling when selecting the 3 administrative wards, there is likelihood that these differentials may not be accurately accounted for in the results. Despite these limitations, this study provides empirical evidence on the levels of male partner involvement and associated factors in Kitui East sub-county, Kenya.

CHAPTER FOUR

RESULTS

4.1 Socio-demographic characteristics

A total of 300 participants were interviewed. Mean age was 36.7, median=36.5 (range 18-65) years. Majority of the respondents were aged between 35-44 years (43.3%), and those aged 18-24 years were the least (5.7%). The mean age for their spouse/ wife was 30.7, median 30.0 and ranged from 17-50 years. With regards to age difference, most (44.6%) were aged 5+ years more than their spouses, and close to 2/5 (39.2%) were aged 1-5 years more than their spouses, 11.1% of the respondents had the same age with their spouses while 5.1% were younger than their spouses. More than half (52.3%) of the respondents had primary education and below, 30.7% had secondary education and 17% had tertiary/post-secondary education. In terms of spouse education, majority (61.0%) had primary and a few (24.7%) had secondary and the least (14.3%) had tertiary/post-secondary education. Majority of the respondents (88%) were living with their spouses. In terms of level of income majority (37.3%) earned between 5,000-10,000Kshs ($50-100) per month, while < 1/3 (31.3%) earned below 5,000Kshs ($50) monthly and only 11.3% earned ≥31,000Kshs ($310) monthly. Concerning family size, most of the respondents (64.3%) had between 1-3 children while about one third (35.7%) had 3 children and above. Only 18.7% of the respondents were formally employed, while 45.3% were in informal employment. The rest were self-employed (34.6%), or receiving financial support from parents or spouse (1.3%). (see Table 4.1).

Table 4.1: Distribution of respondents by socio-demographic characteristics

Variable	Category	Frequency (N=300)	Percentage (%)
Participants Age	18-24 Years	17	5.7
	25-34 Years	101	33.7
	35-44 Years	130	43.3
	45+	52	17.3
Education Level	Primary and below	157	52.3
	Secondary	92	30.7
	Tertiary/ Post-secondary	51	17.0
Religion	Roman Catholic	66	22.0
	Protestant/Other Christian	213	71.0
	Muslim	7	2.3
	No religion	14	4.7
Marital status	Single/Not married	5	1.7
	Married	287	95.7
	Cohabiting	1	.3
	Divorced	1	.3
	Separated	2	.7
	Widowed	4	1.3
Currently Living with Spouse	Yes	264	88.0
	No	36	12.0
Age difference with spouse	Younger than the spouse	15	5.1
	Same age	33	11.1
	1-5 Years older	116	39.2
	5+ Years Older	132	44.6
	N/A	4	
Spouse Education Level	Primary and below	183	61.0
	Secondary	74	24.7
	Tertiary/ Post-secondary	43	14.3
Spouse employment status	Formal employment	31	10.3
	Informal employment	61	20.3
	Not employed	208	69.3
Number of children	1-3	193	64.3
	3-4	57	19.0
	5 and above	50	16.7
Main source of income	Formal employment	56	18.7
	Informal employment	136	45.3
	Business/self employed	104	34.6
	Parental/Spousal support	4	1.3
Level of income	Below 5,000	94	31.3
	5,000 - 10,000	112	37.3
	11,000 - 20,000	41	13.7
	21,000 - 30,000	19	6.3
	31,000 and Above	34	11.3

4.2 Proportion of male partners involved in antenatal care

Overall, 61% (n=183) males were involved in their spouses' antenatal care. Figure 4.1 gives a summary of the proportion of male partner involvement in ANC.

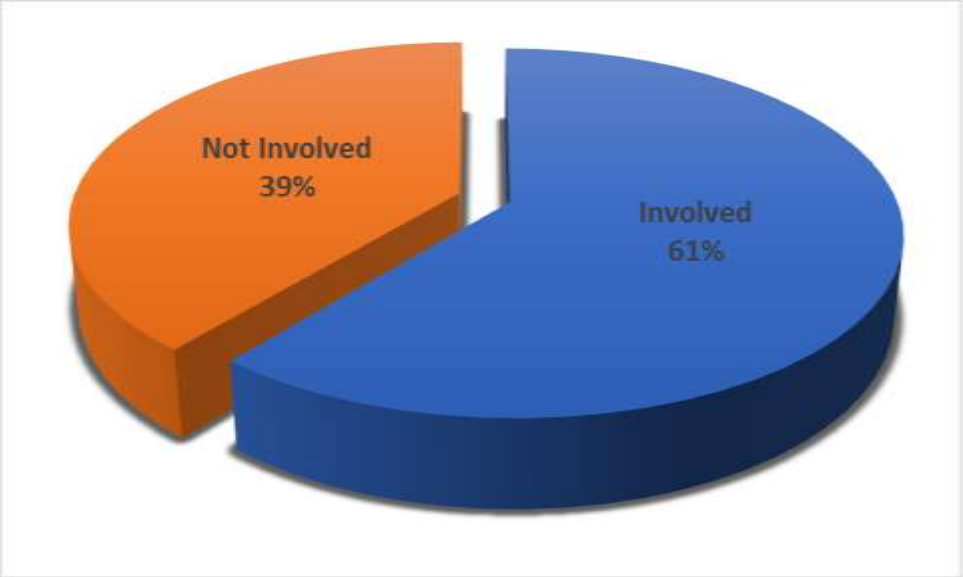

Figure 4.1: Proportion of male partner involvement in ANC

4.2.1 Distribution of male partner involvement

In regards to the distribution of male partner involvement in ANC in the four domains measured (based on the analyses of the 12 dimensions picked) positive responses ranged from 23.3% to 91.0% in twelve questions, with 91% ensuring that their spouses/wives had good nutrition while the least (23.3%) accompanied their wife/spouse to the hospital for their routine antenatal care (see Figure 4.2).

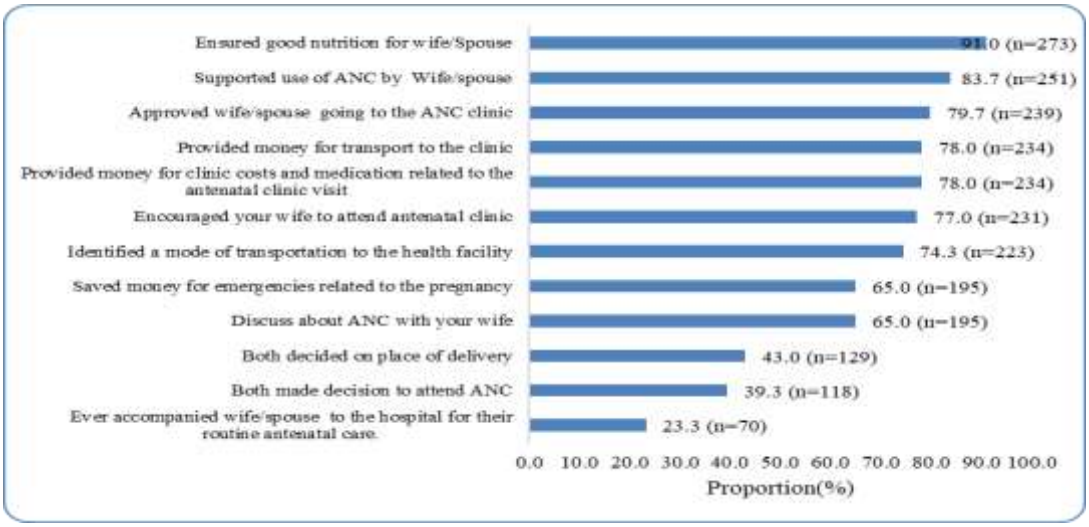

Figure 4.2: Distribution of male partner involvement in ANC

4.2.2 Male Involvement Domains

4.2.2.1 Physical Support

Of the 300 respondents, more than ¾ (88.7%) of them reported that their spouses attended ANC during the recent pregnancy. Of the 300 respondents, the majority (230) reported not to have accompanied their spouses for their routine ANC during the most recent pregnancy and only 70 of the respondents having done so. Among those who had accompanied their spouses, 15% accompanied them less than 3 visits while the least (8.4%) accompanied them for 3 visits or more. Motivation by the health care workers and the desire to have safe delivery were the main reasons given by the respondents for accompanying their spouses both accounting for 8.7%. More than half (66%) of the respondents reported that their spouses had attended ANC during the previous pregnancies, while 18% (n=54) did not attend. Only 26% (n=78) of the respondents reported to have accompanied their spouses for ANC during the previous pregnancies, while majority (40%) did not. At least 13% of male partner cited work commitments as the main reason for not accompanying their spouses. Of the 120 of respondents, 24 reported that they did not see it necessary to accompany their spouses (see Table 4.2).

Table 4.2: Physical support

Variable	Category	Frequency (N=300)	Percentage (%)
Wife attended clinic for antenatal (ANC) check-ups when pregnant?	Yes	266	88.7
	No	34	11.3
Accompanied wife to the hospital for the routine antenatal care during the most recent pregnancy?	Yes	70	23.3
	No	230	76.7
Number of ANC visits accompanied wife?	1	16	5.3
	2	29	9.7
	3	11	3.7
	4	12	4.0
	5	2	.7
	Not Applicable	230	76.7
Motivation behind accompanying wife for antenatal check-up during pregnancy?	For safe delivery	26	8.7
	For healthy child	10	3.3
	Free care	4	1.3
	Health facility nearby	12	4.0
	Good service	6	2.0
	Encouraged by family	1	.3
	Motivated by health care workers	26	8.7
	For monetary benefit	2	.7
Wife attended antenatal checkups during all the previous pregnancies	Yes	198	66.0
	No	55	18.3
	Not Applicable	47	15.7
Accompanied wife for ANC during all the previous pregnancies?	Yes	78	26.0
	No	120	40.0
	Not Applicable	102	34.0
Main reason for missing all/some of the visits?	Lack of or inadequate information	17	5.7
	Not available	7	2.3
	Did not feel like	14	4.7
	Work commitments	39	13.0
	Clinic is too far away from home	16	5.3
	I was scared	3	1.0
	I did not think it was necessary	24	8.0
	Not Applicable	180	60.0

4.2.2.2 Psychosocial Support

Of the 300 respondents, the majority, that is, 83.7% reported that they supported use of ANC by their spouse while the rest (16.3%) did not. In terms of encouragement of

their spouses to attend ANC, while majority (77%) of the respondents encouraged their spouses, 23% reported not to have done so. Consequently, 20.3% of the respondents did not approve their spouses going to ANC, while 79.7% approved. Slightly above average (62.3%) number of respondents identified the date of birth while the rest (37.7%) did not. Majority (63.7%) of the respondents identified the health facility where their spouses would deliver the baby. Noteworthy, 9 out of 10 respondents (91%) ensured their pregnant spouses had good nutrition while the least (9 %) did not. Lastly, while majority of the respondents, that is, 3 out 4 (74.3%) identified the mode of transportation to the health facility, slightly over ¼ (25.7%) did not (see Table 4.3).

Table 4.3: Psychosocial support

Variable	Category	Frequency (N=300)	Percentage (%)
Supported use of ANC by the spouse during the most recent pregnancy?	Yes	251	83.7
	No	49	16.3
Encouraged wife to attend antenatal clinic?	Yes	231	77.0
	No	69	23.0
Approved wife going to the ANC clinic?	Yes	239	79.7
	No	61	20.3
Identified the date of birth	Yes	187	62.3
	No	113	37.7
Identified a health facility where wife would deliver the baby?	Yes	191	63.7
	No	109	36.3
Ensured good nutrition for the wife?	Yes	273	91.0
	No	27	9.0
Identified a mode of transportation to the health facility?	Yes	223	74.3
	No	77	25.7

4.2.2.3 Decision Making Support

Of the 300 respondents, the majority, that is, 43.7% of them reported that both partners should do the decision to make household purchases. However, 2/5 (40%) of the respondents reported that the husband should do the decision, while only 16.3% reported that it is the responsibility of the wife to make such decision. When it comes to deciding what to do with the money the wife earns, a significant percentage (61%) of the respondents reported that the decision should be made by both partners while

24% and 15% thought the decision lies in husband and wife respectively. Almost half of the respondents (45.7%) reported that they jointly decide with the wife how to spend the money the husband earns, 38% reported that they solely decide, while 16.3% reported that the decision is made by the wife solely. Only 7% of the respondents thought that the responsibility of deciding how many children to have and when to have them lies on the wife. A significant percentage (79%) reported that both husband and wife were responsible, while 15% thought it was the husband who should make that decision. More than half (195 out of 300) of the respondents reported to have discussed about ANC with their spouses during the most recent pregnancy, and for those who discussed ANC with their spouses only 39.3% of them decided to attend ANC as a couple while majority (45.7%) thought the wife should solely make the decision. The decision on the place of delivery was majorly (43.3%) made by the wife, while 11% of the respondents made that decision (see Table 4.4).

Table 4.4: Decision making support

Variable	Category	Frequency (N=300)	Percentage (%)
Making household purchases?	Husband	120	40.0
	Wife	49	16.3
	Both Equally	131	43.7
Deciding what to do with the money she earns for her work?	Husband	72	24.0
	Wife	45	15.0
	Both Equally	183	61.0
Deciding how the money you earn will be used?	Husband	114	38.0
	Wife	49	16.3
	Both Equally	137	45.7
Deciding how many children to have and when?	Husband	42	14.0
	Wife	21	7.0
	Both Equally	237	79.0
Discussed about ANC wife with during the most recent pregnancy?	Yes	195	65.0
	No	105	35.0
Decision to attend ANC?	Husband	10	3.3
	Wife	137	45.7
	Both Equally	118	39.3
	Relatives	4	1.3
	Not Applicable	31	10.3
Deciding the place of delivery?	Husband	33	11.0
	Wife	130	43.3
	Both Equally	129	43.0
	Relatives	8	2.7

4.2.2.4 Financial Support

Majority (78%) of the respondents reported to have provided money for transport to the clinic, clinic costs and medication related to antenatal care, while the rest (22%) did not. Notably 35% of the respondents did not save money for emergencies related to the pregnancy, 65% had made such savings (see Table 4.5).

Table 4.5: Level of financial support

Variable	Category	Frequency (N=300)	Percentage (%)
Provided money for clinic costs and medication related to the antenatal clinic visit during the most recent pregnancy?	Yes	234	78.0
	No	66	22.0
Provided money for transport to the clinic during the most recent pregnancy?	Yes	234	78.0
	No	66	22.0
Saved money for emergencies related to the pregnancy?	Yes	195	65.0
	No	105	35.0

4.3 Determinants of male partner involvement in ANC

4.3.1 Socio-cultural factors and Attitude

4.3.1.1 Socio-cultural factors

Of the 300 respondents, more than half (62.3%) of the respondents reported that it is not a bad omen in their community for a man to escort his pregnant wife to hospital for ANC checkups. However, slightly over 1 out of 3 (37%) reported that their friends would view them as “less men” if they accompanied their spouses to ANC visits. In terms of how their male friends viewed pregnancy and childbirth, majority (42.7%) of them agreed that their friends thought that this was entirely a woman’s business. Only 6.3% of the respondents agreed that their religious beliefs affect their decisions on ANC, while majority (89.3%) disagreed. In terms of traditional and cultural beliefs, 18.4% of the respondents agreed that these affect the decisions men make concerning ANC (see Table 4.6).

Table 4.6: Socio-Cultural Norms

Items	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Childbearing is a women's affair and does not require the husband's participation	63(21.0%)	73(24.3%)	19(6.3%)	73(24.3%)	72(24.0%)
Antenatal care is women's business and a man should not have to worry about it	58(19.3%)	68(22.7%)	14(4.7%)	81(27.0%)	79(26.3%)
Fear of being tested for HIV hinder accompanying wife to the clinic	49(16.3%)	53(17.7%)	57(19.0%)	92(30.7%)	49(16.3%)
Bad omen for men to escort their pregnant women to hospital for antenatal check ups	21(7.0%)	54(18.0%)	38(12.7%)	88(29.3%)	99(33.0%)
Male friends think pregnancy and child birth is women's business	38(12.7%)	90(30.0%)	48(16.0%)	63(21.0%)	61(20.3%)
Viewed as less of a man if seen escorting pregnant wife to hospital	36(12.0%)	75(25.0%)	34(11.3%)	104(34.7%)	51(17.0%)
Religious beliefs affect decisions on antenatal care	12(4.0%)	7(2.3%)	13(4.3%)	153(51.0%)	115(38.3%)
Traditional and cultural beliefs in community affect decision on antenatal care	23(7.7%)	32(10.7%)	39(13.0%)	101(33.7%)	105(35.0%)

4.3.1.2 Attitude towards male involvement in ANC

Of the 300 respondents, 56.3% of them disagreed that pregnancy is a risky period for the mother's health, while the rest agreed (36%) or were neutral (7.7%). A significant percentage (81%) of the respondents agreed that antenatal checkup is important for a pregnant woman; however, slightly more than ¾ of them reported that when a woman is pregnant, it is her responsibility to go to the clinic. Regarding ANC interest, at least 64.3% of the respondents expressed their interest in knowing more about ANC and half (50.7%) of them acknowledged the awareness they had about ANC to have gotten it from healthcare providers. Only 33.4% of the respondent agreed that men should accompany their wives to the clinic when they are pregnant. More than half (56.3%) of the respondents noted that men feel embarrassed accompanying their wives to the antenatal clinic (see Table 4.7).

Table 4.7: Attitude towards male involvement in ANC

Items	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Pregnancy is a risky period for the mother's health	64(21.3%)	44(14.7%)	23(7.7%)	91(30.3%)	78(26.0%)
It is important for a pregnant woman to go for Antenatal check-up	111(37.0%)	132(44.0%)	38(12.7%)	17(5.7%)	2(0.7%)
When a woman is pregnant, it is her responsibility to go to the clinic (R)	94(31.3%)	139(46.3%)	20(6.7%)	30(10.0%)	17(5.7%)
Interested in knowing more about ANC	60(20.0%)	133(44.3%)	71(23.7%)	28(9.3%)	8(2.7%)
Men share the responsibility of antenatal care with their wives	37(12.3%)	98(32.7%)	36(12.0%)	97(32.3%)	32(10.7%)
Men should accompany their wives to the clinic when they are pregnant	44(14.7%)	56(18.7%)	20(6.7%)	107(35.7%)	73(24.3%)
Men feel embarrassed accompanying their wife to the antenatal clinic (R)	67(22.3%)	102(34.0%)	44(14.7%)	57(19.0%)	30(10.0%)

Whereas those who did not get involved had a high score of attitude, those who were involved had high scores of socio-cultural norms (see Table 4.8).

Table 4.8: Socio-cultural norms/ Attitude Scores

Measure	Male Involvement		T	d.f	sig.
	No	Yes			
Negative socio-cultural norms score	22.5±5.9	30.3±6.6	-10.4	298	**<0.001**
Positive attitude score	25.3±4.9	18.3±4.7	12.3	298	**<0.001**

In multivariate analyses controlling for confounders, socio-cultural norms were found to positively influence male partner involvement, unlike attitude (see Table 4.9).

Table 4.9: Multivariate analysis of attitude and socio-cultural norms

Parameter	Category	A.O.R	95% C.I.		Sig.
			Lower	Upper	
Education level	Primary and Below	0.87	0.74	1.01	0.074
	Secondary	1.01	0.86	1.18	0.920
	Tertiary/Vocational	0.74	0.59	0.93	**0.008**
	College/University	Ref.			
Socio-Cultural Norms	Scores	1.02	1.01	1.02	**<0.001**
Attitude Score	Scores	0.97	0.96	0.98	**<0.001**
Age Difference	Younger than Wife	0.96	0.77	1.19	0.694
	Same Age	1.08	0.93	1.25	0.340
	1-5 Years Older	1.00	0.90	1.11	0.976
	5+ Years	Ref.			

4.3.2 Health services' related factors

The mean distance to the nearest facility was 4.82 kilometers, with majority (48%) using motorcycle (taxi) to get there, while the least (2.7%) used bicycles as the means of transport. At least 2 out of 5 respondents (42.7%) reported that the nearest facility was a dispensary. The waiting period for majority (73%) was less than 3 hours before they were attended to, while only 2% reported a waiting period of more than 5 hours (see Table 4.10).

Table 4.10: Health services related factors

Variable	Category	Frequency (N=300)	Percentage (%)
Distance to the nearest healthcare facility from the house	≤2 kms	91	30.3
	3-5 kms	111	37.0
	6≥ kms	98	32.7
Facility type	Dispensary	128	42.7
	Health Center	110	36.7
	Sub-County hospital	24	8.0
	County referral hospital	24	8.0
	Private clinic	14	4.7
Means of transportation	Walking	101	33.7
	Bicycle	8	2.7
	Motorcycle (Boda boda)	144	48
	Motorcycle (Own)	4	1.3
	Public transport (Matatu/Bus)	12	4
	Taxi	22	7.3
	Personal car	9	3

However, over a half (59.7%) of the respondents reported that service provision was slow and took long. At least 38.7% of the respondents said that the waiting bay that doubles up as a counseling space lacked privacy and was crowded with mothers and children (see Table 4.11).

Table 4.11: Health services related factors associated with male partner involvement

Items (N= 119)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Service provision was slow and the waiting hours were long (R)	13(10.9%)	32(26.9%)	3(2.5%)	34(28.6%)	37(31.1%)
The waiting bay and counseling space lacked privacy and was crowded with mothers and children (R)	14(11.8%)	57(47.9%)	2(1.7%)	36(30.3%)	10(8.4%)
Service providers were rude and unfriendly (R)	9(7.6%)	15(12.6%)	6(5.0%)	49(41.2%)	40(33.6%)
Offered sufficient consultation time and received sufficient information	2(1.7%)	15(12.6%)	6(5.0%)	64(53.8%)	32(26.9%)
Given the opportunity to ask questions and clarify doubts during consultation	4(3.4%)	16(13.4%)	15(12.6%)	40(33.6%)	44(37.0%)
Opinions were taken into consideration	2(1.7%)	19(16.0%)	21(17.6%)	50(42.0%)	27(22.7%)
Treated respectfully and did not feel judged by staff	7(5.9%)	15(12.6%)	10(8.4%)	60(50.4%)	27(22.7%)
Given priority because of accompanying wife	24(20.2%)	37(31.1%)	19(16.0%)	29(24.4%)	10(8.4%)
The motive for visit addressed and the medical care we received was satisfactory	4(3.4%)	8(6.7%)	13(10.9%)	59(49.6%)	35(29.4%)

Note (R)-Reverse coded

Respondents who had high health services related score were likely to be involved compared to those who scored less (see table 4.12).

Table 4.12: Health services related score

Measure	Male Involvement		T	d.f	sig.
	No	Yes			
Health system Score	28.3±8.1	32.5±7.6	-2.3	117	**0.031**
Distance to the nearest Health care Facility	4.9±3.6	4.8±3.4	0.4	298	0.681

There was a statistically significant association between means of transport to the facility and male partner involvement (P<0.001). There was also a statistically significant association between type of facility and male partner involvement (p<0.05) (see table 4.13).

Table 4.13: Health Services Related Factors Multivariate Analyses

Variable	Category	Involvement		χ^2	d.f.	p-value
		No	Yes			
Distance from the health facility	<2 Km	34(37.4%)	57(62.6%)	0.147	1	0.701
	>2Km	83(39.7%)	126(60.3%)			
Facility Type	Dispensary	53(41.4%)	75(58.6%)	9.53	4	**0.049**
	Health center	45(40.9%)	65(59.1%)			
	Sub county hospital	9(37.5%)	15(62.5%)			
	County referral hospital	10(41.7%)	14(58.3%)			
	Private clinic	0(0.0%)	14(100.0%)			
Transport means to the health facility	Uses transport means	61(30.7%)	138(69.3%)	17.31	1	**<0.001**
	Walking	56(55.4%)	45(44.6%)			

4.3.3 Male partners' ANC Awareness

Almost all (93.3%) the respondents had heard about ANC with only 1 out of 15 reporting not to have heard about ANC (Figure 4.3)

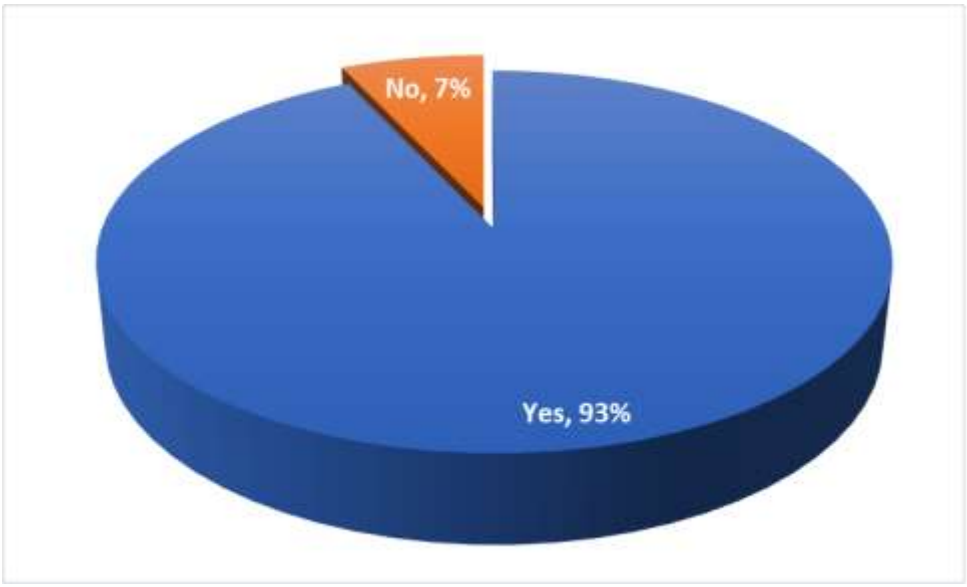

Figure 4.3: Heard of ANC

ANC package awareness was distributed as follows among the respondents: blood screening for hepatitis B infection (24%), blood screening for HIV infection (69%), blood screening for hemoglobin level (39%), blood pressure measurement (68%), blood sugar testing (32.3%) and weight monitoring (72.3%). see Figure 4.4

Figure 4. 1: Awareness of ANC package

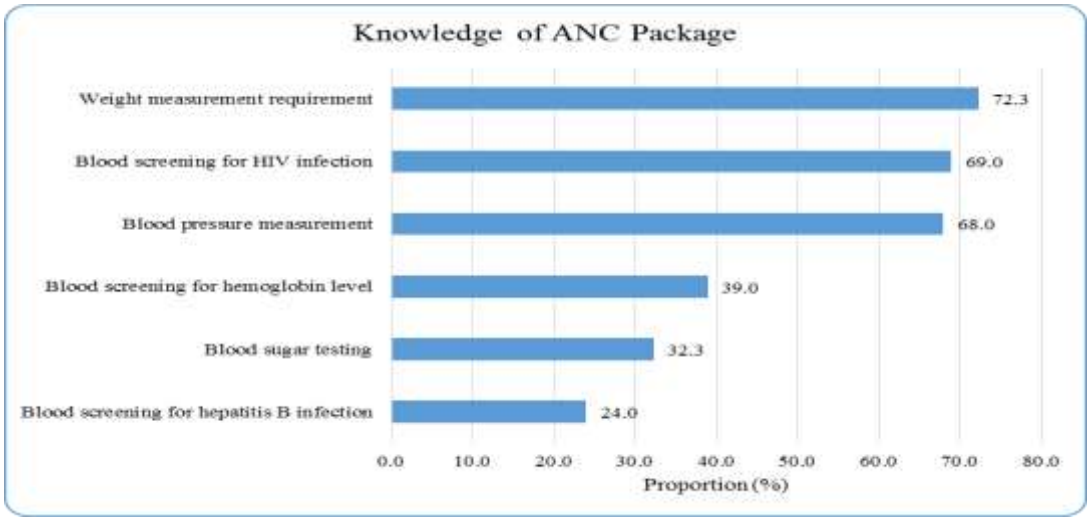

Figure 4.4: Heard of ANC

Only 14.7% of the respondents were aware of all items that included in an ANC package. Majority (46%) were aware of only 3-5 items in the ANC package while 39.3% knew only 2 items and below in the ANC package (see figure 4.5).

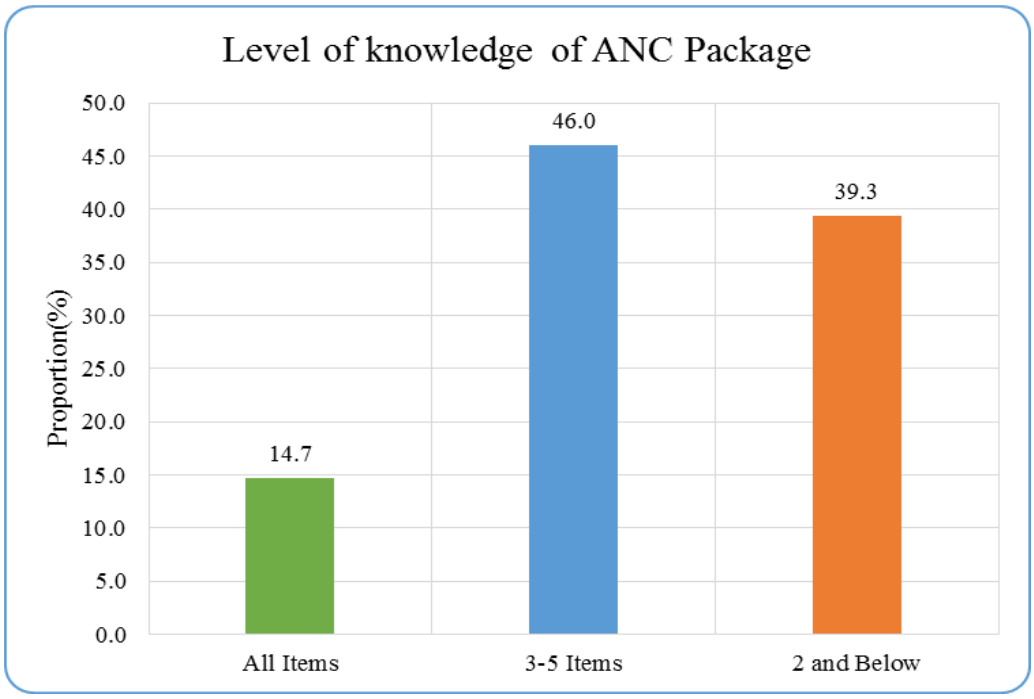

Figure 4.5: Level of awareness of ANC package

Results of bivariate analyses indicate that there was a significant relationship between respondent's level of awareness of (all items or 3 to 5) items in the ANC package and being involved ($p < .001$) (see Table 4.14).

Table 4.14: Bivariate analyses on ANC package awareness

ANC Package	Respose	Not Involved	Involved	O.R(95% C.I)	Sig.
Blood screening for hepatitis B infection	No	105(46.1%)	123(53.9%)	Ref.	
	Yes	12(16.7%)	60(83.3%)	4.3(2.2-8.4)	**<0.00**
Blood screening for HIV infection	No	60(64.5%)	33(35.5%)	Ref.	
	Yes	57(27.5%)	150(72.5%)	4.8(2.8-8.1)	**<0.00**
Blood screening for hemoglobin level	No	93(50.8%)	90(49.2%)	Ref.	
	Yes	24(20.5%)	93(79.5%)	4.0(2.3-6.8)	**<0.00**
Blood pressure measurement	No	61(63.5%)	35(36.5%)	Ref.	
	Yes	56(27.5%)	148(72.5%)	4.6(2.7-7.7)	**<0.00**
Blood sugar testing	No	96(47.3%)	107(52.7%)	Ref.	
	Yes	21(21.6%)	76(78.4%)	3.2(1.9-5.7)	**<0.00**
Weight measurement requirement	No	60(72.3%)	23(27.7%)	Ref.	
	Yes	57(26.3%)	160(73.7%)	7.3(4.2-12.9)	**<0.00**
ANC Package	All Items	7(15.9%)	37(84.1%)	9.2(3.8-22.5)	**<0.00**
	3-5 Items	35(25.4%)	103(74.6%)	5.1(3.0-8.8)	**<0.00**
	2 and Below	75(63.6%)	43(36.4%)	Ref.	

On the awareness of danger signs in pregnancy, at least 73.3% were not aware of the danger signs with only 26.7% reporting to have such awareness (see Figure 4.6).

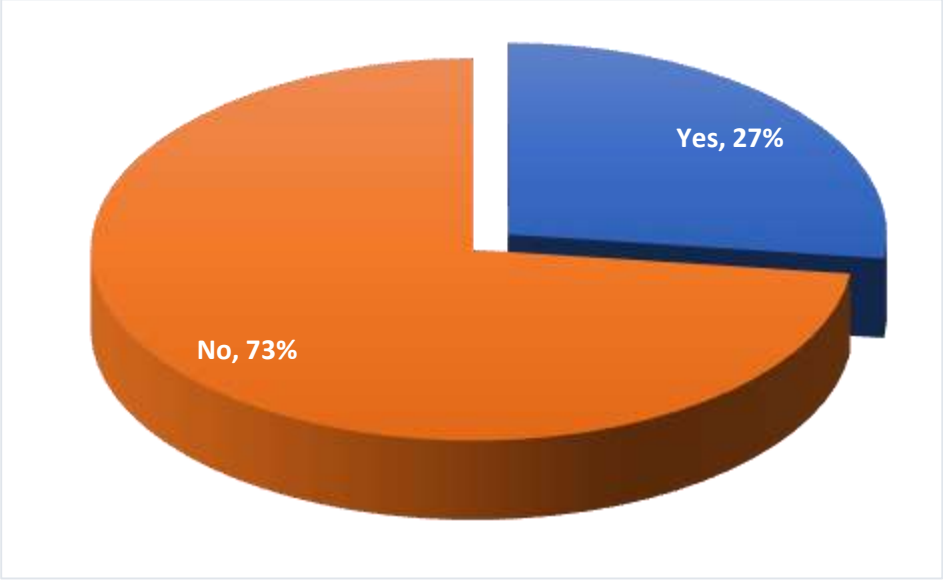

Figure 4.6: Awareness of danger signs

The responses for danger signs awareness among the respondents were distributed as follows: pain in the abdomen (19.3%), vaginal bleeding/discharge (13.7%), weak or no movement of baby (9.7%), convulsion (7.3%), excessive vomiting (5%), persistent swelling of limbs (4.3%) and visual disturbance (0%). Figure 4.7 gives a summary of danger signs awareness.

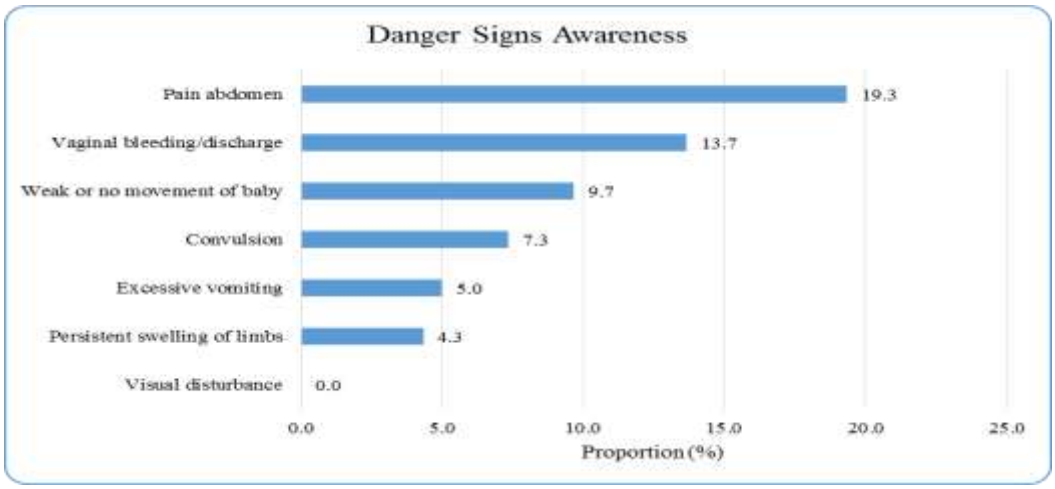

Figure 4.7: Danger signs awareness

The respondents who were aware of: persistent swelling of limbs, vaginal bleeding/discharge, convulsion, weak or no movement of baby and pain in the abdomen as danger signs during pregnancy were more likely to be involved compared to those who lacked such awareness (see Table 4.15).

Table 4.15: Danger signs awareness association with involvement

Danger Sign	Response	Not Involved	Involved	O.R(95% C.I)	Sig.
Excessive vomiting	No	115(40.4%)	170(59.6%)	Ref.	
	Yes	2(13.3%)	13(86.7%)	4.4(1.0-19.9)	0.054
Persistent swelling of limbs	No	116(40.4%)	171(59.6%)	Ref.	
	Yes	1(7.7%)	12(92.3%)	8.1(1.0-63.5)	**0.045**
Vaginal bleeding/discharge	No	109(42.1%)	150(57.9%)	Ref.	
	Yes	8(19.5%)	33(80.5%)	3.0(1.3-6.7)	**0.008**
Convulsion	No	115(41.4%)	163(58.6%)	Ref.	
	Yes	2(9.1%)	20(90.9%)	7.1(1.6-30.8)	**0.009**
Weak or no movement of baby	No	112(41.3%)	159(58.7%)	Ref.	
	Yes	5(17.2%)	24(82.8%)	3.4(1.3-9.1)	**0.016**
Pain abdomen	No	105(43.4%)	137(56.6%)	Ref.	
	Yes	12(20.7%)	46(79.3%)	2.9(1.5-5.8)	**0.002**

In regards to the options the respondents gave incase their wives/spouses got any problem during pregnancy, majority (93%) would report to health center while the least (1%) would ignore the problem. The rest would do home remedy (4.7%) or self-medication (1.3%) (see Table 4.16).

Table 4.16: Responding to pregnancy related emergencies

Parameter	Category	Frequency (N=300)	Proportion (%)
If your wife got any problem during her pregnancy, what would you do:-	Report to Health center	279	93.0
	Home remedy	14	4.7
	Self-medication	4	1.3
	Ignore it	3	1.0

4.4 Bivariate analyses of factors associated with male involvement.

On bivariate analyses of the factors associated with male involvement in antenatal care for their spouse/wife, participants who were aged between 18-24 years were less involved as compared to those aged 45+ years ($P<0.05$). Respondents with primary level of education and below were less involved as compared to those with tertiary/post-secondary education ($P<0.05$). Respondents with informal employment were more involved as compared to those who were unemployed ($P<0.05$). Respondents with less than 4 children were more involved as compared to those with 5+ children ($P<0.05$). Participants who did not have awareness of the minimum number of ANC visits, those who were not aware of danger signs of pregnancy and those who their spouses had unplanned pregnancy were less involved ($P<0.05$). Participants whose spouses went for ANC during previous pregnancies were more involved as compared to those who didn't. Respondents who earned less than 30,000ksh a month and those who make decision alone of the money earned were less involved ($P<0.05$) (see Table 4.17).

Table 4.17: Bivariate analyses of factors associated with male involvement

Variable	Category	Male Involvement		O.R. (95% C.I.)	Sig.
		No (n=117; 39.0%)	Yes (n=183; 61.0%)		
Age	15-24 Years	11(64.7%)	6(35.3%)	0.29(0.09-0.91)	**0.034**
	25-34 Years	39(38.6%)	62(61.4%)	0.84(0.42-1.69)	0.628
	35-44 Years	49(37.7%)	81(62.3%)	0.88(0.45-1.71)	0.698
	45+	18(34.6%)	34(65.4%)	Ref.	
Age difference	Younger than spouse	6(40.0%)	9(60.0%)	0.98(0.33-2.90)	0.964
	Same Age	13(39.4%)	20(60.6%)	1.00(0.46-2.18)	1.000
	1-5 Years Older	43(37.1%)	73(62.9%)	1.10(0.66-1.84)	0.707
	6+ Years older	52(39.4%)	80(60.6%)	Ref.	
Education Level	Primary and Below	82(52.2%)	75(47.8%)	0.28(0.14-0.58)	**0.001**
	Secondary	23(25.0%)	69(75.0%)	0.92(0.41-2.06)	0.845
	Tertiary/ Post-secondary	12(23.5%)	39(76.5%)	Ref.	
Currently Living with Wife	Yes	100(37.9%)	164(62.1%)	1.47(0.73-2.95)	0.283
	No	17(47.2%)	19(52.8%)	Ref.	
Wife's Employment status	Formal Employment	2(6.5%)	29(93.5%)	11.73(2.73-50.43)	**0.001**
	Informal Employment	22(36.1%)	39(63.9%)	1.43(0.79-2.59)	0.231
	Not Employed	93(44.7%)	115(55.3%)	Ref.	
Number of children	1-2	69(35.8%)	124(64.2%)	2.93(1.54-5.57)	**0.001**
	3-4	17(29.8%)	40(70.2%)	3.84(1.72-8.59)	**0.001**
	5 and Above	31(62.0%)	19(38.0%)	Ref.	
Awareness of the minimum required number of ANC Visits	No	101(50.5%)	99(49.5%)	0.19(0.10-0.34)	**<0.001**
	Yes	16(16.0%)	84(84.0%)	Ref.	
Aware of danger signs of pregnancy	No	100(45.5%)	120(54.5%)	0.32(0.18-0.59)	**<0.001**
	Yes	17(21.3%)	63(78.8%)	Ref.	
Pregnancy Planned	No	56(70.9%)	23(29.1%)	0.16(0.09-0.28)	**<0.001**
	Yes	61(27.6%)	160(72.4%)	Ref.	
Went to ANC during previous pregnancies	Yes	54(27.3%)	144(72.7%)	4.31(2.59-7.15)	**<0.001**
	No	63(61.8%)	39(38.2%)	Ref.	
Level of income	Below 5,000	51(54.3%)	43(45.7%)	0.08(0.02-0.29)	**<0.001**
	5,000 - 10,000	46(41.1%)	66(58.9%)	0.14(0.04-0.48)	**0.002**
	11,000 - 20,000	14(34.1%)	27(65.9%)	0.19(0.05-0.72)	**0.015**
	21,000 - 30,000	3(15.8%)	16(84.2%)	0.52(0.09-2.85)	0.448

Variable	Category	Male Involvement		O.R. (95% C.I.)	Sig.
	Above 30,000	3(8.8%)	31(91.2%)	Ref.	
Decision on Money earned	Respondent	63(55.3%)	51(44.7%)	0.28(0.16-0.47)	**<0.001**
	Wife	19(38.8%)	30(61.2%)	0.54(0.27-1.08)	0.082
	Respondent and wife	35(25.5%)	102(74.5%)	Ref.	
Source of information about ANC	Mass/Print Media	17(36.2%)	30(63.8%)	3.12(1.26-7.71)	**0.014**
	Partner/Wife	42(64.6%)	23(35.4%)	0.97(0.41-2.26)	0.942
	Health care Providers	35(23.0%)	117(77.0%)	5.91(2.72-12.87)	**<0.001**
	Discussion with people	23(63.9%)	13(36.1%)	Ref.	
Provider Attitude	Positive	59(33.7%)	116(66.3%)	1.86(0.89-3.87)	0.098
	Negative	41(45.6%)	49(54.4%)	1.13(0.52-2.47)	0.762
	Not applicable	17(48.6%)	18(51.4%)	Ref.	

4.5 Independent predictors of male partner involvement

The odds of involvement in respondents who were aged 18-24 years was 0.22 times less as compared to those aged 45+ years *AOR 0.22 (0.05, 1.002).* Respondents with 1-2 children and 3-4 children were about 4 and 5 times more involved *AOR 4.34 (1.61, 11.66), AOR 4.77 (1.56, 14.53)* respectively as compared to those aged 5 and above.

The odds of male involvement among respondents who did not have awareness of the minimum number of ANC visits was 0.35 less involved (*AOR 0.35 (0.16, 0.78))* as compared to those with who have that awareness. The odds of male involvement among respondents who their spouses had unplanned pregnancy was 0.21 times less involved (*AOR 0.21 (0.10, 0.45)).* Respondents whose spouses/wives went for ANC during previous pregnancies were about 5 times more involved (*AOR 4.85 (2.34, 10.07))* as compared to those who did not.

Respondents who make decision about money earned alone and those whose wives/ spouse makes decision alone were about 0.42 (*AOR 0.42 (0.20, 0.86))* and 0.37 (*AOR 0.37 (0.14, 0.98))* respectively, less involved as compared to respondents who make the decision jointly (see Table 4.18).

Table 4.18: Independent Predictors of Male Involvement

Variable	Category	A.O. R	95% C.I. A.O.R.		Sig.
			Lower	Upper	
Age	18-24 Years	0.22	0.05	1.00	**0.049**
	25-34 Years	0.40	0.14	1.12	0.080
	35-44 Years	0.41	0.15	1.07	0.068
	45+				
Education Level	Primary and below	0.85	0.29	2.54	0.775
	Secondary	1.45	0.45	4.65	0.534
	Tertiary/ Post-secondary	Ref.			
Wife's Employment status	Formal Employment	3.47	0.55	22.00	0.188
	Informal Employment	0.82	0.35	1.93	0.648
	Not Employed	Ref.			
Number of children	3	4.34	1.61	11.66	**0.004**
	4	4.77	1.56	14.53	**0.006**
	5 and above	Ref.			
Awareness of the minimum required number of ANC Visits	No	0.35	0.16	0.78	**0.010**
	Yes	Ref.			
Aware of danger signs of pregnancy	No	0.55	0.24	1.24	0.149
	Yes	Ref.			
Pregnancy Planned	No	0.21	0.10	0.45	**<0.001**
	Yes	Ref.			
Went to ANC during previous pregnancies	Yes	4.85	2.34	10.07	**<0.001**
	No	Ref.			
Level of income	Below 5,000	0.55	0.10	2.95	0.482
	5,000 - 10,000	0.43	0.09	2.17	0.307
	11,000 - 20,000	0.53	0.10	2.81	0.459
	21,000 - 30,000	0.96	0.12	7.79	0.967
	Above 30,000	Ref.			
Decision on Money earned	Respondent	0.42	0.20	0.86	**0.017**
	Wife	0.37	0.14	0.98	**0.045**
	Respondent and wife	Ref.			
Source of information about ANC	Mass/Print Media	1.77	0.54	5.79	0.347
	Partner/Wife	1.09	0.38	3.14	0.869
	Health care Providers	2.28	0.83	6.31	0.112
	Discussion with people	Ref.			

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Discussion

5.1.1 Socio-demographic characteristics

In line with other studies in the region (Ditekemena *et al.,* 2012; Kariuki & Seruwagi, 2016), our findings show that age was significantly associated with male involvement, with younger men less than 24 years being the least likely to be involved, compared to those aged 45 years and above. This could be because younger men often exhibit lesser responsibility that comes with age. In addition, participants who had less than 4 children demonstrated higher likelihood of involvement compared to those with 5 or more children. In contrast, in a study in Tanzania, Gibore *et al.* (2019) found that having more than 4 children was significantly associated with male involvement in maternity care which was attributed to: fertility preferences, concern over mother's health, and familiarity with the health system. There is likelihood that similar factors influenced the involvement of men with less than 4 children in the present study.

The findings of this study also show that respondents with primary level of education and below are less involved as compared to those with tertiary/post-secondary education. This finding was in contrast with those of studies by Matiang'i *et al.* (2013) and Worku *et al.* (2020) who found that level of education does not influence male partner involvement.

5.1.2 Proportion of Male Partner Involvement

Findings from this study show that 61% of men supported their spouses to access ANC services. These results are consistent with previous studies in Uganda and Western Kenya where the proportion of male involvement was 77.8% and 55.8%, respectively (Alupo *et al.,* 2020; Natai *et al.,* 2020; Ongolly & Bukachi, 2019). However, this study reported almost double the levels of male involvement than those documented in other studies conducted in Nairobi, Kenya (26.2%), Ethiopia

29.8% and Ghana (35%) (Aluisio *et al.,* 2016; Ayalew *et al.,* 2020; Robert Craymah *et al.,* 2017). More importantly, the results of the present study showed that while men provided immense financial and psychosocial support, less than half provided decision-making support and less than a quarter provided physical support. These findings suggest that men prefer providing passive support as opposed to direct support. This could be attributed to social, cultural and health system barriers. Our observation is affirmed by reports of studies in SSA, that indicate hegemonic masculinity and the social construction of pregnancy as a female enterprise that largely contributes towards the propensity for men to prefer providing passive support (Maluka & Peneza, 2018; Matseke *et al.,* 2017; Mbadugha *et al.,* 2019; Ongolly & Bukachi, 2019; Singh *et al.,* 2016; Vermeulen *et al.,* 2016).

The findings of the present study also show that men whose spouses had planned pregnancies were more likely to be involved compared to those who had unplanned pregnancy. The findings suggest that men portray a greater sense of responsibility when a pregnancy is accepted by the couple as affirmed by a study in Kenya (Githae, 2018). However, this is contrasted by a study in Uganda where the likelihood of involvement was higher for unplanned pregnancies (Kariuki & Seruwagi, 2016).

5.1.3 Socio-cultural factors

Findings in this study indicate that cultural factors can have an impact on male partner involvement. These cultural factors include among others: community viewing men accompanying their spouses for ANC as a bad omen; childbearing being viewed as a women affair only by the community and that men should not worry about it; community viewing men as weaklings if seen accompanying their spouses to ANC. This implies that, a man would not want to be seen accompanying his wife to ANC because he fears being viewed as less of a man by his friends. The finding is similar to those Ongolly & Bukachi (2019) found in their study in Western Kenya where men reported that their culture and the view that pregnancy is a woman's affair had hindered them from being actively involved especially when it came to physical support.

5.1.4 Health services' related factors

A previous study indicated that the distance to the nearest health facility is significantly associated with male partner involvement (Robert Craymah *et al.,* 2017). However, findings of the present study show that there was no association between the distance to the nearest health facility and male partner involvement. This may imply that male partner involvement is not influenced by geographical accessibility of ANC services. Importantly geographical accessibility (the actual distance covered to and from health facilities) has been a determinant of health services utilization (Al-Taiar *et al.,* 2010).

In addition, the findings in this study show that respondents who had high health service system scores were more involved than those who scored less. This is consistent with previous study findings where unfavourable clinic experiences such as long waiting hours, crowded waiting spaces, and harsh treatment by health providers were found to discourage male involvement (Ditekemena *et al.,* 2012; Falade-Fatila & Adebayo, 2020).

The findings also indicate that respondents whose spouses/wives went for ANC during previous pregnancies were more likely to be involved compared to those who had not. These findings suggest that men appreciated the need to support their wives based on counselling and experience from previous ANC interactions (Githae, 2018), but it is also likely that they had a positive experience with the health system that motivated them (Murahwa *et al.,* 2015). Further, it is plausible to suggest that high awareness of ANC could have played a role in male involvement.

5.1.5 Antenatal care awareness in relation to male involvement

In the current study, awareness of the minimum number of ANC visits and danger signs during pregnancy was found to be associated with male involvement. These findings suggest that an understanding of the risks, benefits and roles that men can play is critical for their involvement, and is consistent with those of other studies which found significant association between knowledge of ANC as well as

awareness of danger signs and male involvement (Falade-Fatila & Adebayo, 2020; Gize *et al.,* 2019; Kabanga *et al.,* 2019; Worku *et al.,* 2020).

In addition, communication between the couples especially the female partner briefing the male partner about ANC requirements may have played a role because participants who made joint decisions about finances were more likely to be involved compared to those who (or their wives) made the decision unilaterally. It is therefore plausible to state that joint decision making meant spouses had good communication that made it easier to discuss and prioritize ANC. The finding is consistent with a study which reported that positive interpersonal relationships lead to equitable decision making (Al-Mujtaba *et al.,* 2020), and conversely poor communication contributes to lack of male involvement (Jabeen *et al.,* 2017).

5.2 Conclusions

- This study has filled the gap in establishing the proportion of male partners involved in ANC and factors that determine their involvement. It has demonstrated that more than half of the participants reported involvement in ANC services. Participants were primarily involved in providing passive support, that is, financial and psychosocial support, while decision making and physical support was generally low. However, 39% of men are not involved in ANC and this can have a negative impact on maternal outcomes.
- Moreover, lack of ANC awareness among male partners contributes to their less involvement. This is especially lack of awareness on the danger signs during pregnancy, the antenatal profile and the required minimum number of ANC visits.
- The study has also established that cultural norms and taboos hinder men from ANC involvement as pregnancy is viewed as a women affair and men getting involved are viewed as weaklings by peers and therefore the need to address these.
- Finally, unfavorable conditions in the clinics for instance, lack of privacy in the ANC, long waiting time hinder male involvement.

5.3 Recommendations

The researcher therefore recommends the following:

3 The County Health Management team should devise ways of equipping men with ANC knowledge especially creating awareness on the danger signs during pregnancy, the antenatal profile and the required minimum number of ANC visits.

4 Cultural and religious institutions to create awareness among men to allay any fears associated with culture that may hinder men from getting involved is pivotal.

5 The County Health Management team should ensure that health care facilities provide privacy and short waiting periods in ANC clinics for men willing to accompany their spouses to seek for such services

6 Future research on a larger sample with diverse cultural background to establish predictors of male partner of involvement in ANC is recommended

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APPENDICES

Appendix I: Ethical Clearance

JOMO KENYATTA UNIVERSITY
OF
AGRICULTURE AND TECHNOLOGY
P. O. Box 62000-00200 Nairobi, Kenya Tel 0675870225 OR Extn 3209
Institutional Ethics Review Committee

September 27th, 2019 **REF: JKU/2/4/896B**

Pascalyne Kavesa Nyamai,
School of Public Health.

Dear Mrs. Nyamai,

RE: DETERMINANTS OF MALE INVOLVEMENT IN ANTENATAL CARE IN KITUI EAT COUNTY

The JKUAT Institutional Ethics Review Committee has reviewed your responses to issues raised regarding your application to conduct the above mentioned study with you as the Principal Investigator.

The is to inform you that the IERC has approved your protocol. The approval period is from September 27th 2019 to September 27th 2020 and is subject to compliance with the following requirements:

a) Only approved documents (informed consent, study instruments, study protocol, etc.) will be used.
b) All changes (amendments, deviations, violations, etc.) must be submitted for review and approval by the JKUAT IERC before implementation.
c) Death and life threatening problems and severe adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the IERC immediately.
d) Any changes, anticipated or otherwise that may increase the risks to or affect the welfare of study participants and others or affect the integrity of the study must be reported immediately.
e) Should you require an extension of the approval period, kindly submit a request for extension 60 days prior to the expiry of the current approval period and attach supporting documentation.
f) Clearance for export of data or specimens must be obtained from the JKUAT IERC as well as the relevant government agencies for each consignment for export.
g) The IERC requires a copy of the final report for record to reduce chances for duplication of similar studies.

Should you require clarification, kindly contact the JKUAT IERC Secretariat.

Yours Sincerely,

DR. PATRICK MBINDYO
SECRETARY, IERC

INSTITUTIONAL ETHICS REVIEW COMMITTEE
27 SEP 2019
APPROVED
P.O. Box 62000-00200 NAIROBI

Appendix II: NACOSTI Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 314480

Date of Issue: 20/February/2020

RESEARCH LICENSE

This is to Certify that Ms., Pascalyne Kaveza Nyamai of Jomo Kenyatta University of Agriculture and Technology, has been licensed to conduct research in Kitui on the topic: Determinants of Male Partner Involvement in Antenatal Care in Kitui East sub County for the period ending : 20/February/2021.

License No: NACOSTI/P/20/3780

314480

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application

Appendix III: Participant Information Sheet

STUDY TITLE: Determinants of Male Partner Involvement in Antenatal Care in Kitui East Sub County

I would like to invite you to take part in a research study. Please take time to read the following information carefully and understand why the research is being conducted and what it would involve for you before you decide whether to participate or not. If you have any questions or you would like more information, feel free to ask.

Who am I and what is this study about?

My name is Pascalyne Nyamai, a student in Jomo Kenyatta University of Agriculture and Technology in the department of Public Health. I am doing this study as part of the requirements for the award of the Degree of Master of Science in Public Health of Jomo Kenyatta University of Agriculture and Technology. The overall aim of this study is to establish the factors that make men participate or not participate in antenatal care when their female partners are pregnant specifically in Kitui East Sub County.

What will taking part involve?

Your participation will involve answering questions that the interviewers will ask you through a questionnaire on socio demographic characteristics; sociocultural factors; health system related factors; and your awareness of male partner involvement in antenatal care. The questions will also touch on the physical support; financial support; psychosocial support; and decision making of the male partner in antenatal care. The interview will take approximately 30 minutes.

Why have you been selected to take part?

You have been selected to take part because you fall in the eligible criteria of men who are 18 years and above whose female partner gave birth 12 months prior to the study.

Do you have to take part?

Your participation is voluntary and you have the right to refuse participation, refuse to answer any questions and withdraw at any time without any consequence or prejudice whatsoever.

What are the possible risks and benefits of taking part?

There are no possible risks whether physical or psychological harm that may occur if you choose to participate in the study. There are no direct benefits that you are going to get if you choose to participate. However, we hope that the information obtained in this study will form a useful database for reference by practitioners in antenatal care and may assist in the development of model programs to mitigate poor maternal outcomes.

Will taking part be confidential?

Confidentiality and anonymity of your participation will be ensured. Your responses will be anonymous. Measures that will be taken to ensure confidentiality include:

- Assigning code names that will be used on all research notes and documents
- Keeping signed consent forms, filled questionnaires and any personal information in a locked safe accessible by the principle researcher only.

Participant's data will be kept confidential except in cases where the researcher is legally obligated to report specific incidents. These incidents include, but may not be limited to, incidents of abuse.

How will information you provide be stored and protected?

Signed consent forms and data collected will be stored in a locked safe only accessible by the principal researcher until after my degree has been conferred and that it will be used for the purpose of the current research only.

What will happen to the results?

The final research product will be published and thereafter submitted for the award of my degree.

Who should you contact for further information?

For further information kindly contact the principle researcher:

Pascalyne Nyamai

Mobile number: 0725285386

Email Address: passy.nyamai@gmail.com

THANK YOU

Appendix IV: Consent Form

Title of Study: Determinants of Male Partner Involvement in Antenatal Care in Kitui East Sub County

By signing below, I confirm the following:

 I have been given oral information and read the written information sheet for the above study. I have had the opportunity to ask questions and I have had these answered satisfactorily.

 I understand that my participation is voluntary and I am free to withdraw from the study without giving a reason.

 I understand that my personal details will be confidential.

 I understand that there are no direct benefits I will get from my participation in the study.

I therefore voluntarily agree to take part in this study.

Participant's signature _____ Date _____

Investigator's signature _____ Date _____

Appendix V: Questionnaire

Male Involvement Questionnaire

Socio-Demographic Characteristics			
Q1	In what month and year were you born?	Month of birth_____ DON'T KNOW MONTH Year of birth_____ DON'T KNOW YEAR	 98 98
Q2	Have you ever attended school?	Yes No	1 2
Q3	What is the highest level of school you **attended:** primary, post-primary or vocational, secondary or 'A' level, college or university?	Nursery/kindergarten Primary Secondary Tertiary/Vocational College/University Adult education Other (Specify)_____	1 2 3 4 5 6 96
Q4	What is the highest (standard /form/ year) you completed at that level? IF NO YEAR COMPLETED, WRITE "00"	CLASS/FORM/STANDARD/YEAR……. [__|__]	
Q5	What is your religion?	Roman catholic Protestant/ Other Christian Seventh Day Adventist Muslim No religion Other (Specify)_____	1 2 3 4 5 96
Q6	What is your current marital status	Single/Not married Married Cohabiting Divorced Separated Widowed	1 2 3 4 5 6
Q7	Is your wife living with you now, or does she stay elsewhere?	Living with You Staying Elsewhere	1 2
Q8	How old is your spouse?	AGE IN COMPLETED YEARS_____	
Q9	What is the highest level of education she has attended	Nursery/kindergarten Primary Secondary Tertiary/Vocational College/University Adult education Other (Specify)_____	1 2 3 4 5 6 96
Q10	What is the highest (standard /form/ year) she	CLASS/FORM/STANDARD/YEAR…….[__|__]	

Socio-Demographic Characteristics

	completed at that level? IF NO YEAR COMPLETED, WRITE "00"		
Q11	What is your wife's employment status	Formal employment Informal employment Not employed	1 2 3
Q12	How old are your children? (RECORD THE AGE OF EACH OF THE CHILDREN)	Age in Years_____	
Q13	How many pregnancies has your wife/wives had in total	_____ number of pregnancies	

AWARENESS OF ANTENATAL CARE

Q14	Have you ever heard of antenatal care?	Yes No	1 2
Q15	What do you understand by antenatal care?	It is regular medical and nursing care recommended for women during pregnancy It is to treat and prevent potential health problems throughout the course of the pregnancy It helps in promoting healthy lifestyles that benefit both mother and child Other (Specify)_____	1 2 3 96
Q16	Why is antenatal check-up necessary?	To know the condition of baby To know the health of the mother To avoid complication For safe delivery Other (Specify)_____	1 2 3 4 96
Q17	Is it necessary for a woman to go for ANC even if there is no pregnancy related complication?	Yes No Don't know	1 2 98
Q18	What is the minimum required number of antenatal visits a pregnant woman should make throughout her pregnancy?	1 2 3 4 Other (specify)_____ Don't know	1 2 3 4 96 98
Q19	First antenatal examination should be done within the first 3 months	Yes No Don't know	1 2 98
Does a pregnant woman need to undergo the following test during her antenatal check-up?			
Q20	Blood screening for hepatitis B infection?	Yes No Don't know	1 2 98
Q21	Blood screening for HIV infection?	Yes No Don't know	1 2 98
Q22	Blood screening for haemoglobin level?	Yes No Don't know	1 2 98

Q23	Blood pressure measurement?	Yes	1
		No	2
		Don't know	98
Q24	Blood sugar testing?	Yes	1
		No	2
		Don't know	98
Q25	Can high blood pressure affect the foetal growth?	Yes	1
		No	2
		Don't know	98
Q26	Is weight measurement required during every antenatal visit?	Yes	1
		No	2
		Don't know	98
Q27	Is maternal smoking harmful to the foetus?	Yes	1
		No	2
		Don't know	98
Q28	Can alcohol consumption during pregnancy affect the fetal growth?	Yes	1
		No	2
		Don't know	98
Q29	Are you aware of danger signs of pregnancy?	Yes	1
		No	2
		Don't know	98
Q30	What are the danger signs of pregnancy? *(More than one can be ticked)*	Excessive vomiting	1
		Persistent swelling of limbs	2
		Vaginal bleeding/discharge	3
		Convulsion	4
		Weak or no movement of baby	5
		Visual disturbance	6
		Pain abdomen	7
		Other (Specify)_____	96
Q31	If your wife got any problem during her pregnancy, what would you do: -	Report to health Center	1
		Home remedy	2
		Self-medication	3
		Ignore it	4
		Other (Specify)_____	96
		PHYSICAL SUPPORT	
Q32	Was the most recent pregnancy planned?	Yes	1
		No	2
		Don't Know	98
Q33	When your wife was pregnant, did she attend any clinic for antenatal (ANC) check-ups?	Yes	1
		No	2
		Don't Know	98
Q34	What prompted your wife go for an ANC check-up? *(more than 1 answer can be marked)*	She was sick	1
		She was advised by a health worker	2
		She was advised by a friend	3
		She was advised by family members	4
		Other (Specify)_____	96
Q35	When did your wife visit the health facility for her first ANC check-up?	Between 1st and 2nd month	1
		2-3rd month	2
		3-4th month	3

		Other (Specify)_____	96
		Don't remember	99
Q36	Prior to delivery, how many times did your wife visit the health facility for ANC check-ups?	_____times	
Q37	What informed the choice of health institution you went for checkup? *(more than 1 answer can be marked)*	Close to my house	1
		Close to where I work	2
		Inexpensive	3
		Behavior of staff is good	4
		Convenient timing	5
		Good quality service	6
		Others (Specify)_____	96
Q38	Did you ever accompany your wife to the hospital for their routine antenatal care during the most recent pregnancy?	Yes	1
		No	2
Q39	How many ANC visits did you accompany your wife?	1	1
		2	2
		3	3
		4	4
		5	5
		Other (specify)_____	96
Q40	What motivated you to accompany your wife for antenatal check-up during pregnancy?	For safe delivery	1
		For healthy child	2
		Free care	3
		Health facility nearby	4
		Good service	5
		Encouraged by family	6
		Motivated by health care workers	7
		For monetary benefit	8
		Other (Specify)_____	96
Q41	Did your wife go for antenatal check-ups during all the previous pregnancies?	Yes	1
		No	2
		Don't know	98
Q42	What was the main reason why your wife did not go for ANC?	No time for ANC	1
		Transportation difficulties	2
		No knowledge	3
		Cost Too Much	4
		Facility Closed	5
		Facility is too Far/No facility nearby	6
		Don't trust facility	7
		Poor quality service	8
		Not the first child	9
		She did not think it was necessary	10
		I did not think it was necessary	11
		Did not feel like	12
		Fear of being rebuked by health workers	13

		Expenses were unaffordable	14
		Clinic is too far away from home	15
		Family members disapproved	16
		Poor transportation to the health facility	17
		She was scared	18
		Feel shy	19
		Religious beliefs	20
		She didn't know the importance	21
		Other (Specify)_____	96
		Don't Know	98
Q43	Did you accompany your wife for ANC during all the previous pregnancies?	Yes	1
		No	2
		Don't remember	99
Q44	If answer of above question is No then, what was main reason for missing all/some of the visits?	Lack of or inadequate Information	1
		Opposition from male peers	2
		Not available	3
		Did not feel like	4
		Differences with my wife	5
		Work commitments	6
		Fear of being rebuked by health workers	7
		Expenses were unaffordable	8
		Clinic is too far away from home	9
		Family members disapproved	10
		Poor transportation to the health facility	11
		I was scared	12
		Feel shy	13
		Religious beliefs	14
		Don't know the importance	15
		Wife did not think it was necessary	16
		I Did Not Think It Was Necessary	17
		Too Far	18
		Poor Quality Service	19
		No health facility nearby	20
		Other (Specify)_____	96

PSYCHOSOCIAL SUPPORT

Q45	During the most recent pregnancy, did you support use of ANC by your spouse?	Yes	1
		No	2
		Don't know	98
Q46	Did you encourage your wife to attend antenatal clinic?	Yes	1
		No	2
		Don't know	98
Q47	Did you approve your wife going to the ANC clinic?	Yes	1
		No	2
		Don't know	98
Q48	Did you identify the date of birth	Yes	1
		No	2
		Don't know	98
Q49	Did you identify a health facility where your wife would deliver the baby?	Yes	1
		No	2
		Don't know	98

Q50	Did you ensure good nutrition for your wife?	Yes			1	
		No			2	
		Don't know			98	
Q51	Did you identify a mode of transportation to the health facility?	Yes			1	
		No			2	
		Don't know			98	

DECISION MAKING SUPPORT

Q52	In a couple, who do you think should have the greater say in each of the following decisions:	**Husband**	**Wife**	**Both Equally**	**Don't know**
52a	Making household purchases?				
52b	Deciding what to do with the money she earns for her work?				
52c	Deciding how many children to have and when?				

Q53	During the most recent pregnancy, did you discuss about ANC with your wife?	Yes	1
		No	2
Q54	Who made the decision to attend ANC?	Husband	1
		Wife	2
		Both Equally	3
		Relatives	4
		Friends	5
		Don't Know/Depends	98
Q55	Where was your last (most recent) baby delivered?	In a health facility	1
		At home	2
		Other (specify)	96
Q56	What was the mode of delivery for the recent birth?	Normal vaginal	1
		Caesarean section	2
		Don't know	98
Q57	Who decided the place of delivery?	Husband	1
		Wife	2
		Both Equally	3
		Relatives	4
		Friends	5
		Don't Know/Depends	98

FINANCIAL SUPPORT

Q58	What is your **main** source of income?	Formal employment	1
		Informal employment/ Jua kali	2
		Business/Self employed	3
		Farming	4
		Casual work	5
		Parental/relative support	6
		Spousal support	7
		Pension	8
		Cash transfer from government	9
		Other (Specify)_____	10

Socio-Demographic Characteristics

Q59	What is your level of income per month (Ksh)	Below 5,000	1
		5,000 – 10,000	2
		11,000 – 20,000	3
		21,000 – 30,000	4
		30,000 – 40,000	5
		40,000 – 50,000	6
		Above 50,000	7
Q60	Who usually decides how the money you earn will be used	Respondent	1
		Wife/Partner	2
		Respondent and wife	3
		Other (Specify)	96
Q61	During the most recent pregnancy, did you provide money for clinic costs and medication related to the antenatal clinic visit?	Yes	1
		No	2
		Don't know	98
Q62	During the most recent pregnancy, did you provide money for transport to the clinic?	Yes	1
		No	2
		Don't know	98
Q63	Did you save any money for emergencies related to the pregnancy?	Yes	1
		No	2
		Don't know	98

ATTITUDE TOWARDS ANTENATAL CARE

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Q64	Pregnancy is a risky period for the mother's health					
Q65	It is important for a pregnant woman to go for Antenatal check-up					
Q66	When a woman is pregnant, it is her responsibility to go to the clinic					
Q67	I am interested in knowing more about ANC					
Q68	Men share the responsibility of antenatal care with their wives					
Q69	Men should accompany their wives to the clinic when they are pregnant					
Q70	Men feel embarrassed accompanying their wife to the antenatal clinic					

Q71	From where do you get information about ANC?	Radio	1
		Television	2
		Partner/wife	3
		News paper	4
		Health care providers	5

		Discussion with people	6
		Printed materials	7
		Other (Specify)_____	8

SOCIAL AND CULTURAL NORMS

	I will now read you a statement about pregnancy and antenatal care. Please tell me if you strongly agree, agree, neutral, disagree or strongly disagree with it.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Q72	Childbearing is a women's affair and does not require the husband's participation					
Q73	Antenatal care is women's business and a man should not have to worry about it					
Q74	Fear of being tested for HIV hindered me from accompanying my wife to the clinic					
Q75	In my community, it is a bad omen for men to escort their pregnant women to hospital for antenatal check ups					
Q76	My male friends think pregnancy and child birth is women's business					
Q77	My friends will view me as less of a man if I am seen escorting my pregnant wife to hospital					
Q78	My religious beliefs affect my decisions on antenatal care					
Q79	Traditional and cultural beliefs in my community affect your decision on antenatal care					

HEALTH SYSTEM FACTORS

Q80	How far is the nearest healthcare facility from your house?	_____ kilometers	
Q81	What kind of a facility is it? *(Circle all that apply)*	Dispensary	1
		Health Centre	2
		Sub County Hospital	3
		County referral hospital	4
		Private clinic	5
		Other (Specify)_____	96
Q82	What form of transport do you often use to travel to this	Walking	1
		Bicycle	2

Socio-Demographic Characteristics

	health facility	Motorcycle (Boda Boda)			3	
		Motorcycle (own)			4	
		Public transport (Matatu/bus)			5	
		Taxi			6	
		Personal car			7	
		Other (Specify)_____			96	
Q83	How did you find the attitude of health care providers towards clients in this health facility?	Positive			1	
		Negative			2	
		Don't know/depends			3	
Q84	How long did you have to wait before you were attended to?	Less than 30 min			1	
		30–60 min			2	
		1 hour- 2 hours			3	
		2 hours-3 hours			4	
		3 hours- 4 hours			5	
		4 hours- 5 hours			6	
		More than 5 hours			7	
	To what extent do you agree with the following statements in relation to your experience with ANC services in the health care facility	**Strongly Disagree**	**Disagree**	**Not Sure**	**Agree**	**Strongly Agree**
Q85	Service provision was slow and the waiting hours were long?					
Q86	The waiting bay and counselling space lacked privacy and was crowded with mothers and children					
Q87	Service providers were rude and unfriendly					
Q88	I was offered sufficient consultation time and received sufficient information					
Q89	I was given the opportunity to ask questions and clarify doubts during consultation					
Q90	My opinions were taken into consideration					
Q91	I was treated respectfully and I did not feel judged by staff					
Q92	We were given priority because I had accompanied my wife					
Q93	The motive for my visit was addressed and the medical care we received was satisfactory					

Appendix VI: Publication

Article

PanAfrican Medical Journal

Research

Prevalence and correlates of male partner involvement in antenatal care services in eastern Kenya: a cross-sectional study

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Prevalence and correlates of male partner involvement in antenatal care services in eastern Kenya: a cross-sectional study

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Abstract

Introduction: *male partner involvement in antenatal care (ANC) contributes to improved maternal health outcomes, but has been wanting in sub-Saharan Africa. We investigated the prevalence and factors associated with male involvement in ANC.* ***Methods:*** *this was a cross-sectional survey conducted in November and December 2019 in Kitui East sub-county, Kenya. We recruited men above 18 years whose spouses had given birth 12-months prior to the study. Data were collected at the household level using an interviewer-administered questionnaire. Male involvement was defined as*

provision of physical, psycho-social, decision-making, and financial support, which was measured through twelve questions. Factor scores of the twelve questions were generated by fitting a Rasch model. Participants who scored at least 75% were involved. Bivariate and multivariate logistic regression models were fitted to identify the independent predictors of male involvement. ***Results:*** *a total of 300 participants were interviewed. The mean age was 36.7 years (SD=±7.6), 52.3% had primary level education, 64.3% had between 1-3 children, 44.6% were 5 years older than their spouses, while 37.3% earned between $50-$100 per month. The prevalence of male involvement in ANC was 61% (95%C.I: 55.7%, 66.3%) and was positively associated with previous ANC attendance by the spouse (AOR= 4.96, 95% CI: 2.37, 10.38, p<0.001), having 1-2 and 3-4 children (AOR= 4.57, 95% CI: 1.70, 12.31, p=0.003 and AOR= 4.84, 95% CI: 1.59, 14.79, p=0.006) respectively. On the contrary, participants who lacked knowledge on the minimum ANC visits (AOR= 0.37, 95% CI: 0.17, 0.83, p=0.016), unplanned pregnancy (AOR=0.22, 95% CI: 0.10, 0.48, p<0.001), and individual financial decision-making (AOR= 0.42, 95% CI: 0.21, 0.89, p=0.023) were less likely to be involved.* ***Conclusion:*** *more than half of the participants reported involvement in ANC, which was significantly associated with previous ANC experience and having less than four children. Empowering men with knowledge on ANC and joint decision-making with their spouses is imperative in order to improve male involvement.*

Introduction

Despite a significant global decline in maternal deaths over the past two decades, the rate of maternal mortality remains unacceptably high [1]. Low and middle income countries account for approximately 94% of these maternal deaths annually, with about two thirds occurring in sub-Saharan Africa (SSA) [2]. The estimated maternal mortality ratio (MMR) of SSA is 542 deaths per 100,000 live births, which is more than double the global maternal mortality ratio of 211 deaths per 100,000 live births [2]. In Kenya, the 2014 demographic and health survey reported a MMR of 362 deaths per 100,000 live births, with large regional disparities [3]. Counties such as Mandera, Wajir and Turkana have the highest burden and reported relatively high MMR of 3795, 1683 and 1594, respectively [4].

Most of these maternal deaths which occur as a result of complications during and following pregnancy and childbirth [5-8] are preventable through timely provision of adequate and skilled maternal health care before, during and after childbirth [9,10]. Antenatal care has been documented as a high impact intervention in reducing maternal mortality [11]. Antenatal care (ANC) is defined as the care provided by skilled healthcare professionals to pregnant women and adolescent girls to ensure the best health conditions for both mother and baby during pregnancy [12]. While four ANC visits are the recommended minimum, fewer women (52%) especially in SSA attain this score [13,14]. In Kenya, only 58% of women attend the four recommended ANC visits during pregnancy [3]. Despite the wide availability of ANC services in many settings, women are constrained from accessing the services by a variety of factors including long distance to health facilities, lack of information, inadequate and poor quality services and cultural beliefs and practices [15-18].

Previous research has established that male partner involvement in ANC is positively associated with their pregnant partners' utilization of reproductive health care services, thus improving maternal and child health outcomes [19]. Unfortunately, over the years, male partner involvement in antenatal care has been wanting globally and more so in low and middle income countries. In particular, countries in SSA that account for the larger share of maternal deaths have reported correspondingly low levels of male involvement which include 54% in Tanzania [20], 29.8% in Ethiopia [21], 6% in Wakiso District, Uganda [22] and 26% in Nairobi, Kenya [23].

Although male partner support is of critical importance, there is a paucity of evidence on factors influencing their involvement during ANC in Kenya. Previous studies have mainly examined the level, barriers and effect of male involvement on utilization of ANC services [23-25]. Other studies have documented individual domains of male involvement such as financial, physical and decision-making support, and associated factors [26-29]. To our knowledge, there is a dearth of empirical evidence on how the four main domains (physical, financial, psycho-social and decision-making support) interact to influence male involvement in ANC. The objective of this study was to establish the proportion of male partners involved in ANC, and identify the factors influencing male partner involvement in ANC in Kitui East sub-County, Kenya.

Methods

Study design and study setting: this study was a descriptive cross-sectional survey that was conducted in November and December 2019, in Kitui East sub-county. Kitui East is one of the eight sub-counties in Kitui County that is situated in southeastern Kenya. The sub-county has approximately 17,143 households and has an estimated population of 123,239 individuals. The main economic activity is farming although it is beset by sporadic rainfall. Kitui East sub-County was selected because it is one of the regions that continue to record high rates of maternal mortality, low rates of ANC and skilled birth attendance, and that limited studies have addressed this phenomenon to date [3].

Study participants: eligible study participants were men aged 18 years and above, whose female partners had given birth 12 months prior to the study. We derived a sample size of 297 participants using Cochran´s formula [30] with 5% precision at a 95% confidence interval, and estimated the proportion of male partner involvement in ANC using a similar study by Aluisio [23], which documented 26.2% male involvement. The sampling proportion was derived from the 2014 Kenya Demographic and Health Survey [3], where there were 438 live births from 850 households in the five year period. This translated to approximately 88 births per year, and about one reported birth per 10 households. Using this sampling proportion, we estimated that we needed to visit 2,970 households out of the approximately 17,143 households in Kitui East sub-County, in order to recruit a sample of 297 participants.

Participants were recruited using multi-stage purposive and random sampling. In the first stage, 3 out of the 6 wards in Kitui East sub-county were purposively selected to ensure geographic spread and representation of the rural and peri-urban population. The 2,970 households were then equally distributed across the 3 wards translating to 990 households per ward. Then at ward level, we identified all the community health units and randomly selected 990 households from the household registers. Community health workers from community units covering the selected households were engaged to help identify households with potential participants using the eligibility criteria. The community health workers then guided the study team to the selected households. At the household level, the research assistants screened the potential participants for eligibility using a recruitment script, then invited eligible participants to the study. Those who expressed interest were then consented by the research assistants. Where potential participants were unavailable, or the participants were ineligible or not interested in participation, a replacement household was visited until the sample size of 297 participants was achieved.

Study variables and measurement: data were collected using a standardized questionnaire administered by trained research assistants. Male involvement in antenatal care was measured through twelve (12) questions that directly assessed the four major domains of male involvement; physical support, psycho-social support, decision-making support and financial support. The specific questions were; *(i) "Did you ever accompany your wife to the hospital for their*

routine antenatal care during the most recent pregnancy?", (ii) "During the most recent pregnancy, did you support the use of ANC by your spouse?",(iii) "Did you encourage your wife to attend the antenatal clinic?", (iv) "Did you approve your wife going to the ANC clinic?", (v) "Did you ensure good nutrition for your wife?", (vi) "Did you identify a mode of transportation to the health facility?", (vii) "During the most recent pregnancy, did you discuss ANC with your wife?", (viii) "Who made decision to attend ANC", (ix) "Who decided the place of delivery?" (x) "During the most recent pregnancy, did you provide money for clinic costs and medication related to the antenatal clinic visit?" (xi) "During the most recent pregnancy, did you provide money for transport to the clinic?" (xii) "Did you save any money for emergencies related to the pregnancy?" The respondents answered either "yes" or "no" to all questions except questions viii and ix where if either the man or both partners made the decision, it was coded as 1 or else it was coded as 0. For all other questions "Yes" was coded as 1 "No" as 0. Other variables that were assessed through a standardized questionnaire included knowledge of ANC, sources of ANC information, and perceived health provider's attitude towards the participants. The questionnaire was pre-tested by trained research assistants who administered it among 15 participants who met the study's eligibility criteria and were drawn from a separate ward that was not sampled for the study.

Statistical analysis: the completed questionnaires were first reviewed for any inconsistencies. Data were then entered into the statistical package for social sciences (SPSS) version 24, where further cleaning was done to ensure the completeness of the dataset.

Male involvement: data reduction techniques were used to summarize the observed male involvement variables into a few dimensions through latent variable modelling using the "eRm" [31], "ltm" [32], and "difR" [33] R package. Component internal consistency and reliability used to calculate male involvement scores were assessed by calculating Cronbach's alpha (a), which was found to be 0.913 (95% C.I, 0.896-0.926).

Pairwise associations between the 12 males involvement variables were computed using spearman's correlation and all variables were found to be significantly positively correlated to each other, hence all items were retained for further analysis. Factor scores were then generated by fitting a one-parameter logistic regression model, also known as the Rasch model [34]. The scores had a bimodal negatively skewed distribution, suggesting that there were two groups. Participants scoring less than zero were classified as "not-involved" while those with more than zero were classified as "involved". Each participant needed to score a 1 in at least 9 of the 12 items (75% and above) to be considered involved.

Determinants of male involvement: descriptive statistics were employed to estimate the frequencies of participants' socio-demographic characteristics and other factors that included knowledge of ANC, sources of ANC information, and perceived health provider's attitude. The association between male involvement and other variables were estimated using bivariate logistic regression, which was first fitted to identify potential predictors and confounding factors. Variables with a p-value <0.25 were fitted into a multivariate binary logistic regression model to identify independent predictors of male involvement. Adjusted odds ratio with its 95% confidence interval was calculated to report the strength and significance of the association. All tests were two-sided and statistical significance was set at $p \leq 0.05$.

Ethical considerations: ethical considerations were complied with before, during and after the data collection activity. Ethical approval was obtained from the Jomo Kenyatta University of Agriculture and Technology (JKUAT) Institutional Ethics Review Committee (IERC), and a research permit was obtained from the National Commission for Science, Technology and Innovation (NACOSTI). All

research assistants undertook human subject´s protection training. All participants provided informed written consent and the survey interviews were conducted in locations that guaranteed both verbal and visual privacy for the participants. Participant names were not captured in the data collection tools and all completed tools were stored in locked cabinets only accessible by the principal investigator. Personal identifiers were kept separate from the data collection tools and were all destroyed upon completion of the data collection.

Results

A total of 300 participants were enrolled in the study. The mean age of the participants was 36.7 years (SD=±7.6), and the majority (43.3%) were aged between 35-44 years. The mean age for the participants´ spouses was 30.8 years (SD=±6.1). In addition,44.6% of the participants were aged 5 years or older than their spouses. More than half (52.3%) of the respondents had primary education and below, 30.7% had secondary education and 17% had tertiary/post-secondary education. The majority (37.3%) earned between $50 - $100 per month and most of the respondents (64.3%) had between 1-3 children.

About two thirds (66.7%) of the participants had no knowledge of the required minimum number of ANC visits and 73.0% were unaware of danger signs of pregnancy. Most (73.7%) had planned for their spouse´s pregnancies, while 66% of the respondents indicated that their spouses went for ANC during previous pregnancies. With regard to decision-making on finances, 45.7% of the respondents indicated that they jointly made decisions with their spouse, 38% made the decision alone, and 16.3% indicated that their spouses made the decision. Slightly more than half (50.7%) of the respondents received information on ANC from health care providers, followed by 21.7% who received information from their spouses, and another 15.7% from mass media sources. More than half of the respondents (58.3%) indicated that the health service providers had a positive attitude, while 30% reported a negative attitude, and 11.7% had not visited the health facility (Table 1).

The overall prevalence of male involvement in antenatal care was 61% (n=183), (95% C.I: 55.7%, 66.3%). However, involvement in each of the twelve male involvement variables ranged from 23.3% to 91.0%, with the majority (91%) ensuring that their spouses had good nutrition while the least (23.3%) accompanied their wife/spouse to the hospital for routine antenatal care (Table 2).

The results of bivariate analysis are presented in Table 3. Participants with 1-2 children and 3-4 children were about 4 and 5 times more involved (AOR= 4.57, 95% CI: 1.7, 12.31), p=0.003; AOR= 4.84, 95% CI: 1.59, 14.79, p=0.006) respectively, as compared to those with 5 children and above. Participants who lacked knowledge of the minimum number of ANC visits were less likely to be involved (AOR= 0.37, 95% CI: 0.17, 0.83, p=0.016) compared to those who had that knowledge. The odds of male involvement among respondents whose spouses had unplanned pregnancies was 0.22 times less involved (AOR=0.22, 95% CI: 0.10, 0.48, p<0.001). Participants whose spouses went for ANC during previous pregnancies were about 5 times more involved (AOR= 4.96, 95% CI: 2.37, 10.38, p<0.001) compared to those who did not. Participants who made financial decisions alone were about 0.43 (AOR= 0.42, 95% CI: 0.21, 0.89, p=0.023) less involved as compared to participants who made the decision jointly (Table 4).

Discussion

Findings from this study show that 61% of men supported their spouses to access ANC services. The majority provided nutritional support and the least support was in accompanying their spouses to the clinic. Additionally, almost two-thirds were unaware of the danger signs of pregnancy and also lacked knowledge on the minimum required number of ANC visits. The likelihood of male involvement in ANC was higher among participants with less than four children, and those whose

spouses went for ANC during previous pregnancies. These results are consistent with previous studies in western Kenya, Uganda and Tanzania where the proportion of male involvement was 55.8%, 77.8% and 54.4%, respectively [20,24,35]. However, this study reported almost double the levels of male involvement that have been documented in other studies in Nairobi, Kenya (26.2%), Ethiopia (29.8%), and Ghana (35%) [21,23,36].

Participants who had less than 4 children were more likely to be involved compared to those with 5 or more children. While this is in line with findings from similar studies [36,37], these studies made comparison to men who lacked children unlike the present study. In contrast, a study in Tanzania [38] found that having more than 4 children was significantly associated with male involvement in maternity care, and was attributed to fertility preferences, concern over mothers' health, and familiarity with the health system. It is plausible that a positive clinic experience and interest in the health of the mother and baby could have influenced the involvement of men with less than 4 children. However, men with more than 5 children could have been less involved due to socio-cultural beliefs that ANC is a women´s affair or previous negative experiences with the health system as elucidated by other studies in the region [22,35,39,40].

The findings further show that men whose spouses went for ANC during previous pregnancies were more likely to be involved compared to those who did not. These findings suggest that men appreciated the need to support their wives based on counseling and experience from previous ANC interactions [29], but it is also likely that they had a positive experience with the health system that motivated them [41]. An interesting finding was that men who reported unplanned pregnancies were less likely to be involved compared to planned pregnancies. This finding suggests that men portray a greater sense of responsibility when a pregnancy is accepted by the couple as affirmed by a study in Kenya [29]. However, this is contrasted by a study in Uganda where the likelihood of involvement was higher for unplanned pregnancies [22].

While level of education was not significant in contrast to a number of studies [22,29,36,37], men who lacked knowledge on the minimum number of ANC visits were less likely to be involved. These findings suggest that an understanding of the risks, benefits and roles that men can play could be an important factor in their involvement, and is consistent with existing studies which found a significant association between knowledge of ANC and male involvement [37,42-44]. In addition, participants who made financial decisions individually, were less likely to be involved compared to those who made joint decisions with their spouses. It is plausible to state that joint decision-making meant spouses had good communication that made it easier to discuss and prioritize ANC. This finding is consistent with studies which have reported that positive interpersonal relationships lead to equitable decision-making [45], and conversely poor communication contributes to lack of male involvement [39,46].

Study limitations: this study had several limitations. First, this study only interviewed male respondents and did not interview their spouses to corroborate the information reported. There is a likelihood of social desirability bias from some of the respondents who may have wanted to appear more involved than they actually had been. Secondly, the study is likely to have suffered from recall limitation since we sampled participants whose spouses had given birth twelve months prior to the study, and they may have forgotten details of their experiences. Finally, Kitui East sub-County is geographically sparse with part of the sub-County peri-urban and densely populated, while a larger section was rural and sparsely populated. While we attempted to account for this through purposively selecting the 3 wards where data were collected, there is a likelihood that these differentials may not be accurately accounted for in the results. Despite these limitations, this study provides empirical evidence on the levels of male partner involvement

and associated factors in Kitui East sub-county, Kenya.

Conclusion

This study has demonstrated that more than half of the participants reported involvement in ANC services. The majority of the participants provided nutrition support, while fewer participants accompanied their spouses to the clinic. Fewer children and previous ANC experience were significantly associated with male involvement. On the other hand, unplanned pregnancies, lack of knowledge on ANC and individual decision-making on finances were least associated with male involvement. Therefore, empowering men with knowledge of ANC and enhancing couple communication are critical strategies to enhance male involvement in ANC services.

What is known about this topic

- *Male partner involvement in ANC results in improved maternal outcomes;*
- *Previous studies have documented the levels, barriers and effect of male partner involvement on utilization of ANC services;*
- *Studies have also documented individual domains of male partner involvement such as financial, physical and decision-making support, and associated factors.*

What this study adds

- *An understanding of the level of male partner involvement in ANC in Kitui East sub-County;*
- *Empirical evidence on how the four main domains of male involvement (physical, financial, psycho-social and decision-making support) interact to influence male involvement in ANC, and the associated factors.*

Competing interests

The authors declare no competing interests.

Authors' contributions

All authors conceptualized the study. PKN collected and analyzed the data and wrote the initial draft of the manuscript. KN and JM reviewed and revised the manuscript. All authors read and approved this final version.

Tables

Table 1: socio-demographic and other characteristics of the respondents
Table 2: male involvement in antenatal care across 12 dimensions
Table 3: factors associated with male involvement in ANC
Table 4: independent predictors of male involvement in ANC

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Table 1: Socio-demographic and other characteristics of the respondents.

Variable	Category	Frequency (N=300)	Percentage (%)
Age	18-24 Years	17	5.7
	25-34 Years	101	33.7
	35-44 Years	130	43.3
	45+	52	17.3
Age difference	Younger than the wife	15	5.1
	Same age	33	11.1
	1-5 Years older	116	39.2
	5+ Years Older	132	44.6
	N/A	4	
Education Level	Primary and Below	157	52.3
	Secondary	92	30.7
	Tertiary/ Post-secondary	51	17.0
Spouse Education Level	Primary and Below	183	61.0
	Secondary	74	24.7
	Tertiary/ Post-secondary	43	14.3
Currently Living with Wife	Yes	264	88.0
	No	36	12.0
Level of income	Below 5,000	94	31.3
	5,000 - 10,000	112	37.3
	11,000 - 20,000	41	13.7
	21,000 - 30,000	19	6.3
	31,000 and Above	34	11.3
Decision on Money earned	Respondent	114	38.0
	Wife	49	16.3
	Respondent and wife	137	45.7
Number of children	1-3	193	64.3
	3-4	57	19.0
	5 and Above	50	16.7
Knowledge of the minimum required number of ANC Visits	No	200	66.7
	Yes	100	33.3
Aware of danger signs of pregnancy	No	220	73.3
	Yes	80	26.7
Pregnancy Planned	No	79	26.3
	Yes	221	73.7
Went to ANC during previous pregnancies	Yes	198	66.0
	No	102	34.0
Source of information about ANC	Mass/Print Media	47	15.7
	Partner/Wife	65	21.7
	Health care Providers	152	50.7
	Discussion with people	36	12.0
Provider Attitude	Positive	175	58.3
	Negative	90	30.0
	Not applicable	35	11.7

Table 2: male involvement in antenatal care across 12 dimensions	
Male Involvement Items	n(%)
Did you ever accompany your wife to the hospital for their routine antenatal care during the most recent pregnancy?	70(23.3%)
During the most recent pregnancy, did you support use of ANC by your spouse?	251(83.7%)
Did you encourage your wife to attend antenatal clinic?	231(77.0%)
Did you approve your wife going to the ANC clinic?	239(79.7%)
Did you ensure good nutrition for your wife?	273(91.0%)
Did you identify a mode of transportation to the health facility?	223(74.3%)
During the most recent pregnancy, did you discuss about ANC with your wife?	195(65.0%)
Both made decision to attend ANC	118(39.3%)
Who decided the place of delivery?	129(43.0%)
During the most recent pregnancy, did you provide money for clinic costs and medication related to the antenatal clinic visit?	234(78.0%)
During the most recent pregnancy, did you provide money for transport to the clinic?	234(78.0%)
Did you save any money for emergencies related to the pregnancy?	195(65.0%)

Table 3: factors associated with male involvement in ANC

Variable	Category	Male Involvement		O.R. (95% C.I.)	Sig.
		No (n=117; 39.0%)	Yes (n=183; 61.0%)		
Age	15-24 Years	11(64.7%)	6(35.3%)	0.29(0.09-0.91)	0.034
	25-34 Years	39(38.6%)	62(61.4%)	0.84(0.42-1.69)	0.628
	35-44 Years	49(37.7%)	81(62.3%)	0.88(0.45-1.71)	0.698
	45+	18(34.6%)	34(65.4%)	Ref.	
Age difference	Younger than spouse	6(40.0%)	9(60.0%)	0.98(0.33-2.90)	0.964
	Same Age	13(39.4%)	20(60.6%)	1.00(0.46-2.18)	1.000
	1-5 Years Older	43(37.1%)	73(62.9%)	1.10(0.66-1.84)	0.707
	6+ Years older	52(39.4%)	80(60.6%)	Ref.	
Education Level	Primary and Below	82(52.2%)	75(47.8%)	0.28(0.14-0.58)	0.001
	Secondary	23(25.0%)	69(75.0%)	0.92(0.41-2.06)	0.845
	Tertiary/ Post-secondary	12(23.5%)	39(76.5%)	Ref.	
Currently Living with Wife	Yes	100(37.9%)	164(62.1%)	1.47(0.73-2.95)	0.283
	No	17(47.2%)	19(52.8%)	Ref.	
Wife's Employment status	Formal Employment	2(6.5%)	29(93.5%)	11.73(2.73-50.43)	0.001
	Informal Employment	22(36.1%)	39(63.9%)	1.43(0.79-2.58)	0.231
	Not Employed	93(44.7%)	115(55.3%)	Ref.	
Level of income	Below 5,000	51(54.3%)	43(45.7%)	Ref.	
	5,000 - 10,000	46(41.1%)	66(58.9%)	1.70(0.98-2.96)	0.060
	11,000 - 20,000	14(34.1%)	27(65.9%)	2.29(1.07-4.90)	0.33
	Above 21,000	6(11.3%)	47(88.7%)	9.29(3.62-23.82)	<0.001
Decision on Money earned	Respondent	63(55.3%)	51(44.7%)	0.28(0.16-0.47)	<0.001
	Wife	19(38.8%)	30(61.2%)	0.54(0.27-1.08)	0.082
	Respondent and wife	35(25.5%)	102(74.5%)	Ref.	
Number of children	1-2	69(35.8%)	124(64.2%)	2.93(1.54-5.57)	0.001
	3-4	17(29.8%)	40(70.2%)	3.84(1.72-8.59)	0.001
	5 and Above	31(62.0%)	19(38.0%)	Ref.	
Knowledge of the minimum required number of ANC Visits	No	101(50.5%)	99(49.5%)	0.19(0.10-0.34)	<0.001
	Yes	16(16.0%)	84(84.0%)	Ref.	
Aware of danger signs of pregnancy	No	100(45.5%)	120(54.5%)	0.32(0.18-0.58)	<0.001
	Yes	17(21.3%)	63(78.8%)	Ref.	
Pregnancy Planned	No	56(70.9%)	23(29.1%)	0.16(0.09-0.28)	<0.001
	Yes	61(27.6%)	160(72.4%)	Ref.	
Went to ANC during previous pregnancies	Yes	54(27.3%)	144(72.7%)	4.31(2.59-7.15)	<0.001
	No	63(61.8%)	39(38.2%)	Ref.	
Source of information about ANC	Mass/Print Media	17(36.2%)	30(63.8%)	3.12(1.26-7.71)	0.014
	Partner/Wife	42(64.6%)	23(35.4%)	0.97(0.41-2.26)	0.942
	Health care Providers	35(23.0%)	117(77.0%)	5.91(2.72-12.87)	<0.001
	Discussion with people	23(63.9%)	13(36.1%)	Ref.	
Provider Attitude	Positive	59(33.7%)	116(66.3%)	1.86(0.89-3.87)	0.098
	Negative	41(45.6%)	49(54.4%)	1.13(0.52-2.47)	0.762
	Not applicable	17(48.6%)	18(51.4%)	Ref.	

OR - Crude Odds Ratio; CI-Confidence Interval

Table 4: independent predictors of male involvement in ANC

Variable	Category	A.O.R	95% C.I. A.O.R.		Sig.
			Lower	Upper	
Age	18-24 Years	0.22	0.05	1.03	0.055
	25-34 Years	0.39	0.14	1.12	0.080
	35-44 Years	0.43	0.16	1.15	0.092
	45+				
Education Level	Primary and Below	0.80	0.26	2.43	0.692
	Secondary	1.19	0.36	4.00	0.775
	Tertiary/ Post-secondary	Ref.			
Wife's Employment status	Formal Employment	3.40	0.52	22.01	0.200
	Informal Employment	0.86	0.36	2.07	0.741
	Not Employed	Ref.			
Number of children	1-2	4.57	1.70	12.31	0.003
	3-4	4.84	1.59	14.79	0.006
	5andAbove	Ref.			
Knowledge of the minimum required number of ANC Visits	No	0.37	0.17	0.83	0.016
	Yes	Ref.			
Aware of danger signs of pregnancy	No	0.47	0.20	1.09	0.079
	Yes	Ref.			
Pregnancy Planned	No	0.22	0.10	0.48	<0.001
	Yes	Ref.			
Went to ANC during previous pregnancies	Yes	4.96	2.37	10.38	<0.001
	No	Ref.			
Level of income	Below 5,000	0.55	0.10	2.97	0.484
	5,000 - 10,000	0.49	0.10	2.49	0.388
	11,000 - 20,000	0.65	0.12	3.51	0.617
	21,000 - 30,000	1.39	0.16	12.22	0.766
	Above 30,000	Ref.			
Decision on Money earned	Respondent	0.43	0.21	0.89	0.023
	Wife	0.39	0.15	1.04	0.059
	Respondent and wife	Ref.			
Source of information about ANC	Mass/Print Media	1.58	0.48	5.19	0.454
	Partner/Wife	1.10	0.38	3.17	0.865
	Health care Providers	2.35	0.84	6.52	0.102
	Discussion with people	Ref.			
Provider Attitude	Positive	2.60	0.86	7.87	0.091
	Negative	2.04	0.65	6.37	0.221
	Not applicable	Ref.			

A.O.R-Adjusted Odds Ratio; C.I-Confidence Interval

Appendix VII: Map of Kitui County