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Family planning utilization and correlates; perspective of women aged 15-49 years from Mandera County of North Eastern Kenya

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ABSTRACT
Background: Unmet need for modern family planning methods is an important health issue for women. The purpose of this study was to evaluate family planning awareness, utilization and associated factors among women aged 15-49 years from Mandera County, an arid part of North Eastern Kenya.
Methods: This cross sectional study randomly enrolled 117 eligible women from April to September 2015. Data was collected using structured questionnaire, key informant interviews (KII) and focused group discussions (FGD) guides. Up to 36 FDGs were conducted among women in health, leadership, education and religious sectors. 12 KIIs among influential and knowledgeable members of the county were also conducted to gather qualitative data. STATA version 11 was used for qualitative data analysis. The thematic content analysis was used to analyze qualitative data.
Results: The mean age of the 117 women who responded was 29.9 (SD± 9.8) years. About 79.5% of these 117 women were aware of contraceptive and family planning methods mainly through family and friends (52.1%). Of the 41.9% who reported using family planning (FP) methods, 26.5% used condoms. In multivariate analysis, women who were from either the Northern (OR 4.3, 95% CI 1.1 to 18.2), Southern (OR 7.5, 95% CI 1.7 to 33.4) or Eastern of Madera County (OR 4.7, 95% CI 1.1 to 20.8); had either secondary (OR 11.1, 95% CI 2.7 to 46.1) or tertiary (OR 11.9, 95% CI 2.6 to 55.9) level of education; were employed (OR 4.3, 95% CI 1.2 to 19.1); used either condoms (OR 5.7, 95% CI 1.3 to 24.5) or hormonal family planning methods (OR 5.8, 95% CI 1.4 to 25.2) were independently associated with utilization of FP. The FGD and KII confirms the low level of utilization of FP. These discussions identified location of origin, awareness, income, employment, religion and cultural practices as some of the factors limiting the utilization of FP.
Conclusion: Remarkably, a high proportion of women from Mandera County; an arid, region in the North Eastern Kenya, were aware and embraced FP. If deterrents such as socio-cultural, lack of education and awareness are tackled, this region is poised to record one of the highest up take of modern family planning methods in Kenya.
Keywords: Family Planning, Utilization, Women of Reproductive Age.

INTRODUCTION

Globally, improved utilization of family planning contributes in achieving the 5th Universal Sustainable Development Goal (USDG), which focuses on achieving gender equality and empowering all women and girls by 2030 (ICSU, ISSC, 2015). Fostering family planning has been associated with acceleration of socio-economic development, promotion of gender equality, and decreased maternal and infant mortality (UNFPA & PATH, 2008). The past five decades have been marked by significant decrease in fertility rates in Asia, Latin America and North Africa. Sub-Saharan Africa, however, has not experienced the same rapid trend, and today, the region still has total fertility rates (TFR) of around five births per woman (Bongaarts, 2011). Kenya, like many developing economies, is characterized by exponential population growth. This is partly attributed to high fertility and birth rates, steady decline in death rates, low contraceptive utilization rate and high but declining mortality rate (Oyedokun, 2007; Lawoyin *et al.,* 2007; Cleland *et al.,* 2012; Population Reference Bureau, 2013). High population growth rate has been an impediment in the reduction of child mortality, improvement of maternal health, achievement of universal primary education, environmental sustainability and combating HIV and AIDS and other diseases as part of the Millennium Development Goals (MDGs) (Health Policy Initiatives,

2013). In response, Kenya concentrated on birth control measures using family planning (FP) services which enable couples to determine whether, when, and how often to have children (USAID, 2011). FP has a profound effect in controlling population growth. At the micro level, FP contributes critically to birth spacing and controlling family size. Some forms of FP also play the dual role of controlling family size and protection against sexually transmitted diseases (STDs) (Mayo, 2004; Asiimwa *et al.,* 2013). Other benefits include improved maternal and child health, reduced cases of induced abortion and improved household welfare. At the macro level, the benefits of a well-controlled population growth include improved infrastructure and reduced burden on national budgets (USAID, 2011).

Since the Kenya Government incorporated FP into the country's overall development policy in 1965, FP use increased from 18% (1987) to 58% (2014) with a decline in the fertility rates from 8.1 children per woman in 1977 to 3.9 in 2014 (Kenya Demographic and Health Survey, 2014). However, this increase has not been matched with a reduction in the unmet need for FP which has stalled at around 25% and is highest among the less privileged women and those in rural areas (Ojakaa, 2008). The fertility rate in Kenya is lowest in Nairobi County (2.7 children per woman) and highest in North Eastern region (where Mandera county is located) (6.4 children per woman) (Kenya Demographic and Health Survey, 2014). Challenges facing reproductive health in the Mandera County include, but are not limited to inaccessibility to FP services, inadequate health personnel, lack of youth friendly clinics, high incidence of female genital mutilation (FGM), reluctance to accept modern FP methods and lack of sufficient education (National Coordination Agency for Population and Development Ministry of Planning and National Development, 2005). The sustained increase in the use of FP services among women aged between 15 and 49 years, is a major factor in fertility transition, providing women and couples with the means to help them plan pregnancies (Campbell *et al.,* 2006; Republic of Kenya, 2007; USAID/HPI, 2009).
With the 2013 devolution of political power and economic resources from the Central government to the Country's 47 Counties, Mandera County is ranked among the top 3 among Counties receiving the largest share of budgetary allocation. In the 2014/2015 financial year (FY) Mandera County received KES 7.8 billion (about USD 78 million) which was increased to KES 8.9 billion (about USD 87 million) in the 2015/2016 FY, representing 3.5% of Kenya total revenue collection (Republic of Kenya, 2015). The World Bank, Danish International Development Agency (*DANIDA*) among other agencies contribute significantly to Mandera County's health needs. All these are allocated to mitigate the health challenges in Mandera county; upgrade of existing hospitals and construction of others, increase supplies of both pharmaceutical and non-pharmaceutical items, increased health personnel, enable free maternal health care, public health education campaign, improve public education, service delivery, restore public confidence in public health facilities and improve service utilization (Mandera County Government, 2015). This study sought to evaluate the utilization of FP services amongst women of reproductive age in Mandera County.

METHODS

Study design and Settings

This cross sectional study conducted from April 2015 to September 2015, recruited consenting women of reproductive age (15-49 years) living in Mandera County for the last two years. Formula for estimating the population proportion with specified relative precision described by Lemeshow *et al.* (1990), was used to determine the number of participants recruited in the study. Setting α at 0.05, and a FP utilization rate of 4% in the Northern region (Kenya National Bureau of Statistics (KNBS) and ICF Macro, 2009), a total of 117 women were recruited to achieve 0.90 power. Of the 117 women, 16 were recruited from Mandera North, 18 from Mandera South, 18 from Mandera East, 20 from Mandera West, 23 from Banisa and 22 from Lafey.

Data Collection

A total of 36 focus group discussions (FGD) were conducted to explore further the levels of FP service awareness, utilization and associated factors in this region. Randomly six women (two aged 15 – 25 years; two aged 26 – 36 years and two elders 37 – 49 years) of reproductive age from each of the six Sub-Counties were consented and enrolled. These persons were invited to participate in a FGD on a fixed time and date at a convenient location to them in each sub county. Up to 6 FGDs (depending on saturation point of the issues being probed) were carried out in groups of 12 individuals, each group having been selected to reflect the age groups above. A female moderator was trained to help in conducting these discussions in the preferred language of the group, provided the moderator and note taker were fluent in the language. A guide was used for all FGDs, with appropriate modification for different age groups. The discussions lasted approximately 45 minutes.
Key informant interviews (KIIs) were conducted to confirm and clarify any pending or new issues described in the structured questionnaires and FGDs. Key informant interviews have been shown to provide a valuable

foundation for a broader understanding of contextual matters relevant to the issues being explored (Bernard, 1994). Randomly 12 (two persons per Sub-County) influential and knowledgeable members of the Mandera County were identified and intermittently interviewed at a place and time most convenient and confidential for the participants. The key informants were selected based on their position of leadership, either formal or informal, in the community and their ability and willingness to reflect on the study findings. The Key informants included health professionals, religious and tribal leaders, and well regarded women who are experienced in reproductive health and are from the community. In addition to being willing to share, reflect upon the findings of the study, key informants were those observant, articulate and available for multiple interviews of varying duration on an assortment of topics related to the study.

Ethical considerations

The research protocol was presented for scientific and ethical approvals by the Scientific Steering Committee and the Ethical Review Committee of Kenya Medical Research Institute (KEMRI) prior to commencement of field activities. Written informed consent was obtained from each participant. Confidentiality was maintained by assigning all participants with a unique identification number and all paper research records stored in a locked cabinet stationed in a secured room only accessible to the principal investigator. This research adhered to the STROBE guidelines for observational studies as outlined at: http://www.strobe-statement.org.

Statistical analysis

Quantitative data was analyzed using STATA version 13 (StataCorp LP, College Station, TX, USA). Descriptive statistics frequency (%), mean, standard deviation and medium (interquartile ranges at 25% and 75%) were used to express quantitative data. The overall utilization of FP was determined for all participants. In bivariate analyses, odds ratios (OR) and 95% confidence intervals (CI) for the association between utilization of FP and socio-demographic, household demographic, awareness and reproductive health patterns characteristics were calculated using Poisson regression. In multivariate analyses, a manual backward elimination approach was used to reach the most parsimonious model including factors that were associated with utilization of FP among women in Mandera County at the significance level of $P \leq 0.05$.

The qualitative data (FGD and KII) were subjected to a thematic content analysis. This approach entails the categorization of recurrent data collected under thematic areas (Green & Thorogood, 2010). The analysis was done manually using general purpose software tools using Microsoft Word (La Pelle, 2004).

RESULTS

Socio demographic characteristics

In this study, all the 117 recruited participants responded to the structured questionnaire (100% response rate). As shown in Table 1, more than half (56.4%) of the participants were neither pregnant nor lactating, with 23.9% lactating while 16.2% were pregnant. The participants age ranged from 15 to 48 years, with a mean of 29.9 years (± SD 9.8), median of 29 years and IQR of 21 to 38 years. One third (33.3%) of the participants were aged 31 to 40 years with 15.4% aged above 41 years.19.7 % of the respondents had primary level of education, 22.2% had secondary education and tertiary level. A further 35.9% of the participants had informal (such as Madrassa) education. Majority of the participants (86.3%) were Muslims;49.6% were unemployed and 59% were married. The mean monthly income was 20331.9 KES (199.3 USD) ± SD 22953.2 KES (225 USD) ranging from 1000 to 120,000 KES (9.83 - 1,179.60 USD). About 38.5% of them had no monthly income and only 12% earned over 120,000 KES (1,179.60 USD) per month. The majority (61.5%) of the households were male headed. The mean household size was 5.22 (SD = 2.5) ranging from 1 to 13 persons, with a majority (57.3%) having 5 or more 5 persons. The mean number of previous parity was 3.92 (± 3) ranging from 0 to 12 pregnancies. While 46.2% of them had had ≥ 4 pregnancies, 13.7% were nulliparous. The mean number of children living with the participants at the time of the study was 3.39 (± 2.68) ranging from 0 to 11 children, with about 42.7% of them living with 1 to 3 children.

Table 1: Baseline characteristics of study population (n = 117)

Variable	Unit	Number	Percentage
Gravidity	Pregnant	19	16.2
	Lactating	28	23.9
	Pregnant and lactating	4	3.4
	Not pregnant and lactating	66	56.4
Age (Years)	Mean (± SD)	29.9 (± 9.8)	
	Median (IQR)	29 (21-38)	
	15- 20	27	23.1
	21-30	33	28.2
	31-40	39	33.3
	≥41	18	15.4
Education level	Primary	23	19.7
	Secondary	26	22.2
	Tertiary	26	22.2
	Non-Formal	42	35.9
Marital status	Single	23	19.7
	Married	69	59
	Divorced/Widowed	25	21.3
Religion	Christian	16	13.7
	Muslim	101	86.3
Occupation	Employed	23	19.7
	Self employed	36	30.8
	Unemployed	58	49.6
Monthly Income (KES)	Mean (± SD)	20331.5 (±22953.2)	
	Median (IQR)	11000 (7250-26000)	
	None	45	38.5
	≤20000	50	42.7
	≥20001	22	19
Household Headship	Husband	72	61.5
	Respondent's Mother	16	13.7
	Others	29	24.8
Household population	Mean (± SD)	5.22 (±2.5)	
	Median (IQR)	5 (4-7)	
	≤4	50	42.7
	≥5	67	57.3
Parity	Mean (± SD)	3.92 (±3)	
	Median (IQR)	3 (2-6)	
	Nulliparous	16	13.7
	1-3	47	40.2
	≥4	54	46.2
Children a live	Mean (± SD)	3.39 (±2.68)	
	Median (IQR)	3 (1-5)	
	None	19	16.2
	1-3	50	42.7
	≥4	48	41

SD - Standard Deviation; IQR - Interquartile range; KES- Kenya Shillings

Awareness of family planning and contraceptive methods

As presented in Table 2, the majority of the study participants (79.5%) were aware of contraceptive and family planning. Slightly over half (52.1%) of participants first heard about reproductive health and contraception from family and friends. About three quarters (74.4%) of them were aware of hormonal (Pills/Intrauterine Device-IUD/Injectable) method of contraceptive. More than half (56.4%) were not aware of the emergency contraceptive methods. Over two thirds (67.5%) of the participants preferred to have their first child before the age of 21 years. 73.5% of them preferred having below two years of spacing between children. Nearly half of the participants (46.2%) had no idea of the cost of family planning services. 60.7% of the participants said it was not common in the society to discuss FP issues with unmarried girls. Nearly half (49.5%) of them avoided or never discussed FP with their husbands/partners.

Table 2: Family planning awareness among study population

Variable	Unit	Number	Percentage
Awareness of contraceptive and family planning (FP)	Yes	93	79.5
	No	24	20.5
First knowledge on FP	Family and Friends	61	52.1
	Media	4	3.4
	School	18	15.4
	Health care/Professional	22	18.8
	Not stated	12	10.3
Known methods of FP	Natural (Calendar/Withdrawal)	2	1.7
	Barrier (Condoms)	14	12
	Hormonal (Pills/IUD/Injectable)	87	74.4
	None	14	12
Awareness of emergency contraceptive methods	Yes	51	43.6
	No	66	56.4
Age of first child	Between 15-18	31	26.5
	Between 18-21	48	41
	Between 22-24	28	23.9
	Between 25-27	10	8.5
Ideal age of child spacing	One year	31	26.5
	One to two years	55	47
	Three to five years	28	23.9
	Five years or more	3	2.6
Cost of FP	Affordable	51	43.6
	Expensive	7	6
	Free	5	4.3
	No idea	54	46.2
Attitude of unmarried girls about FP	Not common in the society to discuss	71	60.7
	Shameful to discuses	31	26.5
	Commonly discussed	11	9.4
	Never thought about this before	4	3.4
Attitude when discussing with husband/partner about FP	Embarrassing to discuss	15	12.8
	Enjoy discussing	44	37.6
	Avoid or never discuss	58	49.6

Utilization and attributes of family planning methods

As shown in Table 3, 41.9% of the respondents were using contraceptive and modern family planning methods; with 32.5% of these participants were themselves users of these family planning methods. About 26.5% were using condoms, 12% were using the hormonal method, 3.4% were using Natural method. Majority (62.4%) of the participants believed that FP services can be obtained only at the health facilities, with about 35% ranking the quality of FP services as good. About two thirds (67.5%) of the participants lived more than 5 kilometers from the family planning service providers, and 53% identified cultural issues as the major hindrance to women seeking reproductive health services.

Table 3: Utilization and attributes of family planning methods

Variable	Unit	Number	Percentage
Utilization of FP	Yes	49	41.9
	No	68	58.1
Who uses contraceptives	Self	38	32.5
	husband	11	9.4
	None	68	58.1
FP methods used	Natural (Calendar/Withdrawal)	4	3.4
	Barrier (Condoms)	31	26.5
	Hormonal (Pills/IUD/Injectable)	14	12
	None	68	58.1
Provider of FP	Health facilitiy	73	62.4
	Work Place	9	7.7
	Other sources	11	9.4
	None	24	20.5
Quality of FP	Best	9	7.7
	Better	19	16.2
	Good	41	35
	Fair	17	14.5
	Poor	31	26.5
Distance to FP provider	Mean (± SD) (Km)	6.75	(±7.734)
	Median (IQR) (Km)	3	(1-10)
	Range (Km)	40	(1-40)
	>5 KM	79	67.5
	< 5.1 KM	38	32.5
Barrier to utilization of FP	Unaware of provider	36	30.8
	Expensive/Costly	5	4.3
	Distance	10	8.5
	Cultural/Shame issues	62	53
	Poor provider attitude	4	3.4

Factors associated with utilization of FP services

Table 4 summarizes the socio-demographic factors associated with utilization of family planning services. In the bivariate analysis, participants who were more likely to utilize the family planning services were those from Mandera North (OR 3.3, 95% CI 1.2 - 9.4); those who had either secondary (OR 4.8, 95% CI 1.8 - 13.3) or tertiary (OR 7.4, 95% CI 2.8 - 19.5) level of education; those that were Christians (OR 2.3, 95% CI 1.6 - 6.1); or employed (OR 3.2, 95% CI 1.6 - 6.1). On the other hand, participants who had non monthly income (OR 0.3, 95% CI 0.1 - 0.6) and those with less than 10,000 KES monthly income (OR 0.5, 95% CI 0.2 - 0.9) were less likely to utilize family planning services.

In multivariate analysis, after adjusting for region, gravidity, age, education level, marital status, religion, occupation, monthly income, household headship and population, parity and number of children alive, participants who were from Mandera North (OR 4.3, 95% CI 1.1 - 18.2), Mandera South (OR 7.5, 95% CI 1.7 - 33.4), Mandera East (OR 4.7, 95% CI 1.1 - 20.8); those with secondary (OR 11.1, 95% CI 2.7 - 46.1) and tertiary

level of education (OR 11.9, 95% CI 2.6 - 55.2) as well as those who were employed (OR 4.3, 95% CI 1.2 - 19.1) remained associated with utilization of family planning services.

In Table 5, participants who were more likely to utilize the family planning services were those who were aware of family planning services (OR 6.1, 95% CI 1.5 - 24.9), those whose first knowledge about family planning was either at school (OR 7.9, 95% CI 1.1 - 61.5) or health care workers (OR 7.6, 95% CI 1.0 - 58.1); those who had heard hormonal (Pills/IUD/Injectable) as method of contraceptive (OR 7.1, 95% CI 1.1 - 51.4); Participants who were aware of emergency contraceptive methods (OR 3.2, 95% CI 1.7 - 6.1). Those who stated that the cost of family planning services were either affordable (OR 4.8, 95% CI 2.2 - 10.3) or expensive (OR 3.8, 95% CI 1.2 - 12.8); Participants whose partners had positive attitude or enjoyed discussing reproductive health and family planning (OR 3.1, 95% CI 1.7 - 5.8); Participants who used female FP methods (OR 7.4, 95% CI 3.4 - 15.9) or their husbands (male FP methods) (OR 6.2, 95% CI 2.3 - 16.5); those who were using the natural (OR 6.9, 95% CI 1.4 - 35) or barriers (OR 12.9, 95% CI 4.9 - 33.4) or hormonal (OR 13.8, 95% CI 4.9 - 38.3) methods of FP. Lastly participants who believed the quality of family planning services were good and were more likely to utilize the FP services (OR 5.4, 95% CI 1.9 - 15.6). On the other hand, participants who were less likely to utilize the family planning services were those whose ideal age to have first child was between 15 to 18 years (OR 0.1, 95% CI 0.03 - 0.6) or between 18 to 21 years (OR 0.4, 95% CI 0.2 - 0.9); those whose ideal years of child spacing was ≤ one year (OR 0.2, 95% CI 0.05 to 0.8).

In multivariate analysis, after adjusting for awareness of FP, first knowledge of FP, Known methods of FP, awareness of emergency contraceptive, ideal age of first child, ideal age of child spacing, cost of FP, attitude when discussing with husband/partner about FP, who uses contraceptives, methods used for FP, provider of FP and quality of FP; participants who used either barrier (condoms) (OR 5.7, 95% CI 1.3 - 24.5) or hormonal (Pills/IUD/Injectable) FP (OR 5.8, 95% CI 1.4 - 25.2) remained associated with utilization of family planning.

DISCUSSION

This study is first of its kind to investigate the awareness and uptake of family planning and associated factors among women of reproductive age in Mandera County; an arid, region in the North Eastern Kenya. The study was conducted two years post the 2013 devolution of political power and economic resources from the central government to the devolved county governments. Although initial surveys have associated the county with low utilization of FP at 1.9% in 2014 (Asiimwe *et al.,* 2013), this study has shown that the proportion of women aged 15 to 49 years embracing FP is considerably higher than previous studies standing at 41.9%. This rate was slightly lower than that of married women of reproductive age in Kenya (58%) who reported using FP in 2014 (Kenya Demographic and Health Survey, 2014).

During the study period, about 40.1% of these participants were either lactating or pregnant with more than 46.2% having given birth to ≥4 children, pointing to high fertility rate in the region. More than half of the participants were married, with close to 67.5% preferring to have children before the age of 21 years. This is a confirmation of a previous survey that indicated that in this region women have younger ages of sexual debut, young age of motherhood and younger age of first birth pointing to the unmet need for family planning services (Kenya National Bureau of Statistics (KNBS) and ICF Macro, 2009).

The FGDs and KIIs discussions confirms the young age of marriage and child birth. One participant in an FGD participant confirms the young age of marriage *"women here are married at a really young age…for me I was married at my 14th birth day"*. One KII participant said *"if it were not for the current government administration….my husband's clans' men would have married off my three daughters before they attended secondary school, personally I have witnessed a lot of these cases before"*.

Although 79.5% of the participants were aware of family planning only about half of them (41.9%) were currently using contraceptive and family planning. This is not unique to this region. In many developing countries reports shows that despite the campaign on the usefulness of family planning in having smaller and healthier families, contraceptive use is still low (Adeleye *et al.,* 2010; Kenya Demographic and Health Survey, 2014; Lasisi *et al.,* 2014; Nettey *et al.,* 2015). One study in the Kintampo Districts of Ghana reported even higher family planning awareness level (97%) but lower (25.3%) utilization of any modern family planning method (Nettey *et al.,* 2015). Our results and these others show that awareness does not necessarily influence utilization.

Table 4: Association between utilization of FP services and socio-demographic characteristics of study participants from Mandera County

Variable	Sample size	Utilization of Family Planing		Bivariate	Multivariate
		No	%	OR (95% CI)	OR (95% CI)
Region					
Mandera North	16	12	24.5	3.3(1.2-9.4)	4.3(1.1-18.2)
Mandera South	18	8	16.3	1.9(0.6-5.9)	7.5(1.7-33.4)
Mandear East	18	6	12.2	1.4(0.4-4.8)	4.7(1.1-20.8)
Mandera West	20	9	18.4	1.9(0.7-5.9)	2.6(0.8-8.9)
Banissa	23	9	18.4	1.7(0.6-5.1)	1.8(0.6-6.1)
Lafey	22	5	10.2	Referent	Referent
Gravidity					
Pregnant	19	5	26.3	0.5(0.2-1.2)	0.5(0.2-1.4)
Lactating	28	9	32.1	0.6(0.3-1.3)	0.6(0.3-1.4)
Pregnant and lactating	4	0	100	ND	ND
Not pregnant and lactating	66	35	53	Referent	Referent
Age (Year)					
15- 20	27	7	14.3	0.9(0.3-2.9)	0.5(0.1-2.8)
21-30	33	14	28.6	1.5(0.5-4.2)	1.1(0.3-4.6)
31-40	39	23	46.9	2.1(0.8-5.6)	2.1(0.6-6.8)
> 41	18	5	10.2	Referent	Referent
Education level					
Primary	23	6	26.1	2.1(0.7-7.2)	1.7(0.4-6.2)
Secondary	26	15	57.7	4.8(1.8-13.3)	11.1(2.7-46.1)
Tertiary	26	23	88.5	7.4(2.8-19.5)	11.9(2.6-55.2)
Non-Formal	42	5	11.9	Referent	Referent
Marrital status					
Single	23	13	56.5	1.5(0.7-3.7)	1.6(0.4-5.8)
Married	69	27	39.1	1.1(0.5-2.3)	1.2(0.5-3.6)
Divorced/Widow	25	9	36	Referent	Referent
Religion					
Christian	16	13	81.3	2.3(1.2-4.3)	0.5(0.2-1.4)
Muslim	101	36	35.6	Referent	Referent
Occupation					
Employed	23	20	87	3.2(1.6-6.1)	4.3(1.2-19.1)
Self employed	36	13	36.1	1.3(0.6-2.7)	1.4(0.5-4.2)
Unemployed	58	16	27.6	Referent	Referent
Monthly Income (KES)					
None	45	10	22.2	0.3(0.1-0.6)	2.8(0.5-16.1)
≤10000	35	14	40	0.5(0.2-0.9)	1.9(0.5-6.9)
10001-20000	15	7	46.7	0.5(0.2-1.4)	1.8(0.5-6.1)
20001-30000	8	6	75	0.9(0.3-2.3)	1.1(0.4-3.1)
>30001	14	12	85.7	Referent	Referent
Household Headship					
Husband	72	29	40.3	0.9(0.5-1.7)	1.2(0.6-2.8)
Respondent's Mother	16	7	43.8	1.1(0.4-2.4)	1.1(0.4-3.1)
Others	29	13	44.8	Referent	Referent
Household population					
≤4	50	21	42	1.1(0.6-1.8)	0.9(0.5-1.8)
>5	67	28	41.8	Referent	Referent
Parity					
None	16	10	62.5	1.8(0.8-3.8)	1.9(0.1-25.1)
1-3	47	20	42.6	1.2(0.6-2.3)	1.1(0.3-3.7)
>4	54	19	35.2	Referent	Referent
Children a live					
None	19	11	57.9	1.7(0.8-3.7)	0.9(0.1-11.7)
1-3	50	22	44	1.3(0.7-2.5)	1.3(0.4-4.6)
>4	48	16	33.3	Referent	Referent

No - Number; % - Percentage; OR - Odds ratio; CI - confidence interval; ND - Not done

Table 5: Association between FP utilization and awareness patterns of participants

Variable	Sample size	Utilization of Family Planing No	%	Bivariate OR (95% CI)	Multivariate OR (95% CI)
Awareness of Family Planning (FP)					
Yes	93	47	50.5	6.1(1.5-24.9)	0.6(0.1-6.2)
No	24	2	8.3	Referent	Referent
First knowledge on FP					
Family and Friends	61	20	32.8	3.9(0.5-29.3)	
Media	4	2	50	5.6(0.5-66.1)	NS
School	18	12	66.7	7.9(1.1-61.5)	
Health care/Professional	22	14	63.6	7.6(1.0-58.1)	
Not stated	12	1	8.3	Referent	
Known methods of FP					
Natural (Calendar/Withdrawal)	2	0	0	ND	
Barrier (Condoms)	14	4	28.6	4.1(0.4-35.8)	ND
Hormonal (Pills/IUD/Injectable)	87	44	50.6	7.1(1.1-51.4)	
None	14	1	7.1	Referent	
Awareness of emergency FP					
Yes	51	35	68.6	3.2(1.7-6.1)	0.6(0.1-6.2)
No	66	14	21.2	Referent	Referent
Ideal age of first child					
Between 15-18	31	3	9.7	0.1(0.03-0.6)	
Between 18-21	48	17	35.4	0.4(0.2-0.9)	NS
Between 22-24	28	21	75	0.9(0.4-2.1)	
Between 25-27	10	8	80	Referent	
Ideal age of child spacing					
One year	31	6	19.4	0.2(0.05-0.8)	
One to two years	55	18	32.7	0.3(0.09-1.2)	NS
Three to five years	28	22	78.6	0.8(0.23-2.6)	
Five years or more	3	3	100	Referent	
Cost of family planning					
Affordable	51	36	70.6	4.8(2.2-10.3)	
Expensive	7	4	57.1	3.8(1.2-12.8)	NS
Free	5	1	20	1.4(0.2-10.8)	
No idea	54	8	14.8	Referent	
Attitude when discussing with husband/partner about FP					
Embarrassing/avoid to discuss	15	5	33.3	1.2(0.3-4.1)	
Positive/we enjoy discussing	44	31	70.5	3.1(1.7-5.8)	NS
Avoid/never discuss	58	13	22.4	Referent	
Who uses contraceptives?					
Self	38	33	86.6	7.4(3.4-15.9)	1.5(0.4-4.9)
husband	11	8	72.7	6.2(2.3-16.5)	1.2(0.3-4.8)
None	68	8	11.8	Referent	Referent
Methods used for FP					
Natural (Calendar/Withdrawal)	4	2	50	6.9(1.4-35)	4.1(0.7-24.5)
Barrier (Condoms)	31	28	93.3	12.9(4.9-33.4)	5.7(1.3-24.5)
Hormonal (Pills/IUD/Injectable)	14	14	100	13.8(4.9-38.3)	5.8(1.4-25.2)
None	68	5	7.2	Referent	Referent
Provider of Family planning					
Health facilitiy	73	41	56.2		
Work Place	9	7	77.8	ND	ND
Other sources	11	1	9.1		
None	24	0	0	Referent	
Quality of family planning					
Best	9	3	33.3	2.5(0.6-11.5)	
Better	19	6	31.6	2.4(06-8.7)	
Good	41	29	70.7	5.4(1.9-15.6)	NS
Fair	17	7	41.2	0.6(0.3-1.3)	
Poor	31	4	12.9	Referent	

No - Number; % - Percentage; OR - Odds ratio; CI - confidence interval; NS - Not significant; ND - Not done

From the FGDs and KIIs discussions this unmatched awareness and utilization of family planning methods was evident. One participant in an FGD participants confirmed awareness *"that most information including family planning issues are discussed in non-formal settings including Madrassa and in the family units"*. Concerning the family planning types known, most qualitative participants were able to mention at least one modern method but not necessarily approving the method. One participant in an FGD participant "*I know method such as condoms which are available at the clinic"*. The second participant in FGD participant said *"I have seen condom shown to me by the village health worker who also told us about cutting off the Uterus…which I cannot use …I want to die with my whole organs"*.

A participant in an FGD reported that not all women in the region were aware of family planning - *"If I knew family planning before, I would have not given birth to these children.... My children would have been well spaced and much stronger"*. Emergency contraceptives are not known; KII stated *"most women here give birth every year because other than condoms no other family planning methods available can be used quickly to help prevent unplanned children, in fact most pharmacist do not stock these pills"*. A Key informant participant KII stated *"for increased uptake of family planning services, promotion that facilitates awareness about the available family planning services and their possible side effects and benefits is paramount"*.

This study showed utilization of FP was significantly associated women's: region of origin, education level, wealth status (occupation and income), religion, awareness and exposure to the media, and utilization of reproductive health services including modern hormonal contraceptives, and the perceived importance of family planning.

Women from Mandera North, East and South were more likely to utilize family planning. These regions are the most developed constituencies within the County; Mandera East hosts the County government offices and is by infrastructure the most developed. Mandera South and North follow in that order in terms of infrastructure and developed. As expected socioeconomic status, education level, availability and capacity of health care services as well as supplies of available modern family planning methods are considerably better in these three sub-county compared to the other regions within the County. The relationship between development and use of FP has also been reported by other studies (Gizaw & Regassa, 2011).

The role of region of origin to utilization of FP was also shown in the FGD and KII discussion One participant in FGD participant from Lafey said *"I wish I could see these services hear and cheaply, we could be all using these services"*. One participant in the KII participant from Mandera East said" *in this region of Mandera North some of these family planning services thank to devolution are now available in some health facilities*".

Women who had secondary and tertiary level of education were more likely to utilize FP, which is consistent with other studies (Wanyenze *et al.,* 2011; Creanga *et al.,* 2011; Rutaremwa *et al.,* 2011). Higher education level provides women with a better and wider understanding of the FP options including availability, and invariably the benefits of family planning and regulation. Further, education increases awareness of the side effects of contraceptive methods and preference for the most convenient ones (Mekonnen & Worku, 2011).
One participant in an FGD reported on the importance of education: *"I use modern family planning methods because I was made aware of their importance when I was in college"*.
High monthly income and employment equating to wealth had a direct relationship with women's utilization of FP. Women from richer households or high wealth quintiles are empowered are able to afford modern FP services and are most likely better exposed to current reproductive health, FP and contraceptive related issues. Wealth and riches are equated to utilization of modern FP even in other studies (Rutaremwa *et al.,* 2011).
One participant in an FGD said *"I am able to use these family planning methods because I buy them on my own"*.
Although majority of population in this region are predominantly Muslims, participants who were Christians were more likely to uptake family planning. Christian especially the protestants are often highly accepting of contraceptive use compared to Catholic counterparts. This argument is consistent with literature elsewhere where Christian protestant women were more likely to use highly effective contraceptive methods (Jones & Dreweke, 2011). Singh *et al.,* (2003) notes that there is no mention of contraception in Quran (first source of Islamic law), and only mentioned in the sayings of the Prophet Mohammed (the second source of Islamic law) advocating for coitus interrupts to control family size. Further, most Muslims either do not send their children to school or send them to madrasas run by Muslim trusts, the overall environment of the later institutions helps in the continuation

of their traditional values and thus hindering social changes including family planning (Agadjanian *et al.,* 2009).

The FGD and KII discussions highlights the role of religion on uptake of FP. One KII-5 participant on religion and family planning said *"Islam forbids a couple from choosing to practice FP through the use of surgeries which are irreversible"*. One participant in an FGD said *"we are majority Muslims and we rarely are taught about family planning methods. It is like a taboo for us to talk about sex and issues surrounding family planning among family circles:*
Schools and health care as a source of knowledge family planning messages, increased use of FP. Further awareness of modern family planning methods such as emergency contraceptive, condoms and hormonal contraceptives (Pills/IUD/Injectable) were key in the utilization of FP. Exposure to information has been equated to increased demand for learnt services as well as in the long run, behavior change (Wakefield *et al.,* 2010).
Positive attitude of husband/partner on reproductive health and family planning predicted uptake of utilization of. The socio-cultural role of husband or partner has been shown to influence family related issues including FP. This and other similar studies shows strong male influencing in the overall family outlook (Rutaremwa *et al.,* 2011). Therefore, male-to-male outreaches and identifying male champions for family planning in various settings are important in promoting modern FP utilization.

Family planning utilization does not all depended on the women: one *FGD* stated *"for a woman to use family planning services, partner's approval must be granted"*. Another FGD participant on barriers to FP stated *"even if we are asked to have fewer family size since the economy continues to worsens, the overall say lies on the hands of household head". "If I use family planning methods without asking my husband, this will be tragedy for me. He will be seen as weak in the community which no man allows here. I must follow his decision; this is the tradition in this area"*.

Limitations and Conclusions
This was a cross-sectional study with relatively small sample size of participant in the structured interviews. This could partly explain the observed lack of association of some important factors such as age and FP utilization. Further, we were not able to establish the actual role of devolution and the utilization of FP.

Given the limitation in this geographically defined population, hardship and insecurity significant proportion of women were using FP compared to the Kenya demographic health survey reports. Further, socio-cultural, religion and awareness attribute of the participants, provide an important avenue to evaluate the interplay if any of the multifaceted and multilevel factors that impact availability and utilization of FP. Ultimately for the improvement in the proportion of women embracing FP in Kenya especially in the initially marginalized counties experiencing hardship (such as droughts) and insecurity; all concerted efforts must be undertaken to promote and to tackle the socio-cultural deterrents of FP utilization. Should this be achieved, these regions could record one of the highest utilization of FP compared to other wealthy and affluent regions of Kenya. Further studies will be required to shed more lights on our study findings.

Abbreviations
MDGs: Millennium Development Goals; FP- Family planning; USAID - *United States Agency for International Development; STD* - sexually transmitted diseases; FGM - Female genital mutilation; KDHS - Kenya Demographic Health Survey; HPI - Health Policy Initiative; FY – Financial years; DANIDA - Danish International Development Agency; USD – United states Dollar; KES – Kenya shilling; FGD - Focus group discussion; KIIs - Key informant interviews; SSC – Scientific Steering committee; OR – Odds ratio; CI – Confidence interval; SD – Standard deviation and IUD – Intrauterine device.

Competing interests
The authors declare no competing interests.

Authors' contributions
This work was part of Master of Science degree for ASO in public health at the Jomo Kenyatta University of Agriculture and Technology. ASO, conceived and designed the study. ASO conducted field work and collected data, ASO, MON conducted data analysis and wrote the draft manuscript. JKM and FMK designed the study, advised and supervised data analysis and reviewed the manuscript. All authors read and approved the final manuscript.

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References

Adeleye, O.A., Akoria, O.A., Shuaib, Z.O., & Ogholoh, O.D. (2010). "Barriers and knowledge of benefits regarding family planning methods among women attending antenatal clinics in a southern Nigerian community". *Asian Journal of Medical Sciences.* 2(4): 190-194.

Agadjanian, V., Yabiku, S., & Fawcett, L. (2009). "History, community milieu, and Christian Muslim differentials in contraceptive use in sub-Saharan Africa". *Journal for the Scientific Study of Religion.* 48(3), 462–479.

Asiimwe, B.J., Ndugga, P., & Mushomi, J. (2013). "Socio - demographic factors associated with contraceptive use among young women in comparison with older women in Uganda". *Demographic and Health Surveys Working Papers* 2013. 9

Bernard, H.R. (1994). "Research methods in anthropology": Qualitative and quantitative approaches 2nded. London, Sage Publications, 1994

Bongaarts, J. (2011). "Can family planning programs reduce high desired family size in Sub-Saharan Africa?" *Int Perspect Sex Reprod Health*. 37(4):209–16.

Campbell, M., Nuriye, N.S., & Malcolm, P. (2006). "Barriers to fertility regulation. A review of the literature". *Stud Fam Plann.* 37 (Suppl 2):87 –98.

Cleland, J., Conde-Agudelo, A., Peterson, H., Ross, J., & Tsui, A. (2012). "Contraception and health". *Lancet:* 380(9837):149–156.

Creanga, A.A., Gillespie, D., Karklins, S., Tsui, A.O. (2011). "Low use of contraception among poor women in Africa: an equity issue". *Bull World Health Organ.* 89:258–66.

Gizaw, A., & Regassa, N. (2011). "Family planning service utilization in Mojo town, Ethiopia: A population based study". *Journal of Geography and Regional Planning.* 4(6): 355-363

Green, J., & Thorogood, N. (2010): Qualitative Methods for Health Research, (2 edn.) Lodon: Sage Publication, 2010.

Health Policy Initiatives (2013). "Inequalities in the Use of Family Planning and Reproductive Health Services: Implications for Policies and Programs, Washington DC: Futures Group International". Available at http://www.healthpolicyinitiative.com/Publications/Documents/Inequalities%20in%20Use%20of%20Family%20Planning%20final%202-8-07%20bw.pdf. Accessed 15th Dec, 2015.

ICSU, ISSC (2015): "Review of the Sustainable Development Goals: The Science Perspective. Paris: International Council for Science (ICSU)". http://www.icsu.org/publications/reports-and-reviews/review-of-targets-for-the-sustainable-development-goals-the-science-perspective-2015/SDG-Report.pdf accessed Feb, 2016.

Jones, R.K., & Dreweke, J. (2011). "Countering Conventional Wisdom: New Evidence on Religion and Contraceptive Use". New York: Guttmacher Institute; 2011

Kenya Demographic and Health Survey. (2014). "Key indicator". http://reliefweb.int/sites/reliefweb.int/files/resources/Kenya%20Demographic%20and%20Health%20Survey.pdf . Accessed 4th Jan, 2016.

Kenya National Bureau of Statistics (KNBS) and ICF Macro (2009). "Kenya Demographic and Health Survey 2008-09". Calverton, Maryland: KNBS and ICF Macro. http://dhsprogram.com/pubs/pdf/fr229/fr229.pdf. Accessed 4th Jan, 2016.

La Pelle N. (2004). "Simplifying qualitative data analysis using general purpose software tools". *Field Methods.* 16: 85-108

Lasisi, C.J., Bassey, T.I., Ita, A.E., & Awoyemi, O.K. (2014). "Awareness and Utilization of Family Planning Among Married Women in the Traditional Core Areas of Ibadan, Oyo State". *Nova Journal of Humanities and Social Sciences.* 3(2):1-8

Lawoyin, T.O., Lawoyin, O.C., Adewole, D.A. (2007). "Men's perception of maternal mortality in Nigeria". *J Public Health Policy*. 28(3):299–318.

Lemeshow, S., Hosmer, D.K., Klar, J., & Lwanga, S.K., (1990). "World health Organization. Adequacy of samples size in health studies. Available www.tbrieder.org/publications/books_english/lemeshow_samplesize.pdf. Accessed 3rd Nov, 2015.

Mandera County Government (2015): Department of health. http://www.mandera.go.ke/index.php/2015-02-28-06-43-52/health-services. Accessed 20th Jan, 2016.
Mayor, S. (2004). "News: pregnancy and childbirth are leading causes of death in teenage girls in developing countries". *BMJ*. 328:1152.
Mekonnen, W., & Worku, A. (2011). "Determinants of low family planning use and high unmet need in Butajira District". *South Central Ethiopia Reprod Heal*. 8:37.
National Coordination Agency for Population and Development Ministry of Planning and National Development (2005). "Mandera District Strategic Plan 2005-2010 for Implementation of the National Population Policy for Sustainable Development". Available at https://www.yumpu.com/en/document/view/29259240/mandera-district-national-council-for-population-and-developement/3. Accessed May 2016
Nettey, O.E.A., Enuameh, Y.A., Mahama, E., Sulemana, A., Adjei, G., Gyaase, S. (2015). "Family Planning Awareness, Perceptions and Practice among Community Members in the Kintampo Districts of Ghana". *Advances in Reproductive Sciences.* 3: 1-12.
Ojakaa, D. (2008). "Trends and determinants of unmet need for family planning in Kenya". *DHS Working Papers No. 56. Calverton, MD: Macro International, Inc. 2008.* Available at http://dhsprogram.com/pubs/pdf/wp56/wp56.pdf. Accessed 7th Sep, 2015.
Okech, T.C., Wawire, N.W., & Mburu, T.M. (2011). "Contraceptive Use among Women of Reproductive Age in Kenya's City Slums". *International Journal of Business and Social Science*. 2: 22-43
Oyedokun, A.O. (2007). "Determinants of Contraceptive Usage: Lessons from Women in Osun State, Nigeria. Journal of Humanities and Social Science, Volume 1, Issue 2". http://www.scientificjournals.org/journals2007/articles/1204.pdf. 2007. Accessed 14th Dec, 2015.
Population Reference Bureau. (2013). "World Population Data Sheet". *Available http://www.prb.org/pdf13/2013-population-data-sheet_eng.pdf* (accessed 12th Feb, 2016)
Republic of Kenya (2007). "National Reproductive Health Policy. Enhancing reproductive health Status for all Kenyans. http://countryoffice.unfpa.org/kenya/drive/NationalReproductiveHealthPolicy2007.pdf. Accessed 17th Jan, 2016.
Republic of Kenya: Kenya Gazette Supplement No.4l (Senate Bills No. 5). The County Allocation of Revenue bill, 2015. http://kenyalaw.org/4F766DD3-A775-4238-8A32-CB3F61EF46D/FinalDownload/DownloadId-0ADC0BB28004C23B6A02B19D8A6CEB93/4F766DD3-A775-4238-8A32-3CB3F61EF46D/kl/fileadmin/pdfdownloads/bills/2015/CountyAllocationofRevenueBill_2015.pdf. Accessed 18th Jan, 2016.
Rutaremwa, G., Kabagenyi, A., Wandera, A., Jhamba, T., Akiror, E., & Nviiri, H. (2015). "Predictors of modern contraceptive use during the postpartum period among women in Uganda: a population-based cross sectional study". *BMC Public Health*. 15:262
Singh, M.M.C., Khokar, A., Pagare, D., Sharma, N., Mehra, M. (2003). "A study of contraceptive use among ever married Muslim women in an urban slum of Delhi". *Health and Population. Perspectives and Issues.* 26 (1):10 – 15
UNFPA and PATH (2008). "Reducing Unmet Need for Family Planning: Evidence-Based Strategies and Approaches". https://www.unfpa.org/sites/default/files/resourcepdf/EOL_nov08.pdf ov08.pdf. Accessed 25 Feb 2016.
USAID. (2011). "Family Planning". Available at. http://apps.who.int/iris/bitstream/10665/44028/1/9780978856373_eng.pdf. Accessed 17th Dec, 2015.
USAID/HPI (2009). "Achieving Equity for the Poor in Kenya": Understanding Level of Inequities and Barriers to Family Planning Services, Washington D.C. http://www.healthpolicyinitiative.com/Publications/Documents/1247_1_Achieving_Equity_for_Poor_in_Kenya_brief_FINAL_acc.pdf. Accessed 4th Jan, 2016.
Wakefield, M.A., Loken, B., & Hornik, R.C. (2010). "Use of mass media campaigns to change health behavior". *Lancet.* 376:1261–71.
Wanyenze, R.K., Tumwesigye, N.M., Kindyomunda, R., Beyeza-Kashesya, J., Atuyambe, L., & Kansiime, A. (2011). "Uptake of family planning methods and unplanned pregnancies among HIV-infected individuals: a cross-sectional survey among clients at HIV clinics in Uganda". *J Int AIDS Soc.* 14:35.