Patterns of Contraceptive Use among Vulnerable Populations in Kenya

FACULTY OF MEDICINE AND HEALTH SCIENCES

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Doctoral thesis submitted to the Faculty of Medicine and Health Sciences, Ghent University

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ABBREVIATIONS

APHRC	African Population and Health Research Center
BTL/VS	Bilateral Tubal Ligation/Vasectomy
CHW/CHEW	Community Health Worker/ Community Health & Extension Worker
COC/POP	Combined Oral Contraceptive/Progestogen-Only Pill
CPR	Contraceptive Prevalence Rate
DHS	Demographic and Health Survey
FGD	Focus Group Discussion
FHI	Family Health International
FP	Family Planning
FSW	Female Sex Worker
GDP	Gross Domestic Product
HIV	Human Immunodeficiency Virus
ICPD	International Conference on Population and Development
IDIs	In-Depth interviews (IDIs)
IMR	Infant Mortality Rate
IP-ERS	Investment Programme for the Economic Recovery Strategy
IUDs	Intrauterine Devices
KDHS	Kenya Demographic and Health Survey
KEMRI/NERC	KEMRI/National Ethics Review Committee
KNBS	Kenya National Bureau of Statistics
KNH/UoN-ERC	Kenyatta National Hospital and University of Nairobi Ethics and Research Committee

LAM	Lactational Amenorrhea
LARCs	Long Acting Reversible Contraception
MDGs	Millennium Development Goals
MMR	Maternal Mortality Ratio
MSM	Men having Sex with Men
NMR	Neonatal Mortality Rate
NUHDSS	Nairobi Urban Health and Demographic Surveillance System
OR	Odds Ratio
PSI REB	Population Services International Research Ethics Board
RCO	Registered Clinical Officer
SDGs	Sustainable Development Goals
SDP	Standards Days Method
SES	Socio-Economic status
SRH	Sexual and Reproductive Health
STI/Ds	Sexually Transmitted Infections/Diseases
TFR	Total Fertility Rate
UN	United Nations
UNFPA	United Nations Fund for Population Activities
USAID	US Agency for International Development
WHO	World Health Organization

EXECUTIVE SUMMARY

This thesis describes contraceptive use dynamics among selected vulnerable populations in Kenya. More specifically, this thesis provides an in-depth analysis of the subject and gives recommendations for family planning programs and policy makers to address the specific needs of these population groups. We studied young urban women, women who have experienced unintended pregnancy, women living in slum settlements and middle class non-slum settlements, female sex workers, migrant and non-migrant women, and sexually active men by assessing the characteristics of those who use modern contraceptives in Kenya.

The study of urban young women was conducted in purposively selected urban and peri-urban districts in the former administrative units of Nyanza, Coast, and Central provinces of Kenya. In depth interviews were conducted with sexually active women aged 15-24, including users and non-users of contraceptives, drawn from randomly selected households. The results show that the respondents were familiar with some modern methods of contraception and most could describe their general mechanisms of action. Condoms were not considered as contraception by many users. Use of contraception was sometimes associated with perceptions of promiscuity. Fear of side effects and adverse reactions were major barriers to use. The biggest fear was that a method could cause infertility. Many fears were based on myths and misconceptions. Young women learn about both correct and incorrect side effects primarily from their social networks. The findings confirm that awareness and knowledge of contraception do not necessarily translate to use, and that myths and misconceptions,

especially concerning side effects, are the main barriers to modern contraceptive use among young women, with both users and non-users exhibiting a lack of detailed and correct information on the different contraceptive methods. Additionally, the influence of social network/peer approval, beyond the individual's beliefs was emphasized, hence the need for targeted and proactive engagement with the wider community. We suggest the use of mass media and peer campaign strategies to help dispel myths and share accurate information about contraception among young women to enhance uptake and sustained use (Article 1).

To assess and compare prevalence of contraceptive use, as well as factors associated with contraceptive method choice, in slum and non-slum contexts, we interviewed 1,873 women, 926 in slum settlements and 947 women in middle class areas in Nairobi, Kenya. Contraceptive method choice was similar across slum and non-slum residents: slightly over a third of women (34.3%) in slum communities and 28.1% of women in non-slum communities were using short-term methods. Long-term methods, such as female and male sterilization, intrauterine devices and implants, were more often used by women in non-slum areas (9.2%) as compared to 3.6% in slum communities. As expected, older women were less likely to use short-term methods, while currently married women were more likely to use modern rather than traditional contraceptives. Women with three or more children were more likely to use long term methods. Women working outside the home or in formal employment used modern methods of contraception more than those in self-employment or unemployed. Investments in increasing access to various contraceptive options

among women living in slum and non-slum settlements are urgently needed to expand access to contraceptives and consequently increase contraceptive choice and use, especially among married couples. Ensuring a wider range of services to serve the diverse needs of couples in long term or stable partnerships in both slum and non-slum areas is needed. Some women, especially from slum settlements, could benefit from extra awareness and education campaigns to dispel myths and misconceptions around contraceptive use (Article 3).

The impact of a history of unplanned pregnancies on contraceptive behaviour among women living in slum and non-slum urban settlements showed that Kenya, like most countries globally, continues to experience high levels of unintended pregnancies, with predictable adverse consequences on desired family size, fertility decline and population growth. The quantitative and qualitative data showed that women who have had an unintended pregnancy are "ready for change", meaning they are ready to use modern contraceptives. We recommend that family planning program implementers utilize antenatal, delivery and post-delivery care services as entry points to identify women whose pregnancy is unplanned, and provide them with information and services to prevent a repeat unplanned pregnancy, thereby strengthening the integration of family planning with maternal and child health services. Further, there is need for concerted efforts to address barriers that women face in accessing these services; more data are needed to understand underlying barriers for maternal and child health information and services (Article 2).

Female Sex Workers (FSWs) are vulnerable to a broad range of social, sexual and reproductive health problems, such as sexually transmitted infections (STIs)/HIV, unintended pregnancy, exploitation, stigma and discrimination, and violence. As a result, FSWs are in dire need of comprehensive and integrated sexual and reproductive health services. Despite these needs, existing programs pay little attention to the broader sexual and reproductive health and rights of these women, often focusing on prevention, care and treatment of HIV and other STIs while neglecting their reproductive health needs, including access to a wide range of contraceptive methods. The aim of this study was to explore FSWs' experiences with existing contraceptive methods while also looking at their role in access and use of contraceptives. We focused on women aged 15-49 years, who reported current sex work, defined as 'providing sexual services in exchange for money or other material compensation as part of an individual's livelihood'. Our findings reveal that while some FSWs know about modern contraceptives, others have no idea or altogether refuse to use contraceptives for fear of losing clients. Their interactions with different client types also act as a barrier but sometimes provide opportunities for contraceptive use among some FSWs. Most FSW acknowledge the importance of dual protection for HIV/STI and pregnancy prevention, nevertheless, pervasive myths and misconceptions on contraceptive use still exist and act as barriers to uptake of contraceptives. Furthermore, fear of being tested for HIV at family planning clinics and long queues at the clinics hinder access to SRH services and could potentially result in a loss of existing clients. We recommend delivery of contraceptives to FSWs via a multi-

sectoral approach involving community based distribution. We also recommend the introduction of targeted counseling services to provide information on the benefits of non-barrier contraceptive methods with additional support services to manage side effects arising from their use to encourage uptake and dual use of contraceptives for both pregnancy and STI/HIV prevention (Article 4).

Use of modern contraceptives among migrant (women engaged in movement from rural to urban, urban to urban, and urban to rural) and non-migrant (women living in urban or rural areas without change of residence) populations was assessed and compared. In a country where regional differentials in population growth and poverty reduction continue to be priorities in the post Millennium Development Goal (MDG) development agenda, understanding the relationships between contraceptive use and internal migration is highly relevant. We use data from the 2008-09 Kenya Demographic and Health Survey (KDHS) from 5,905 women aged 15-49 years who reported being sexually active in the last 12 months prior to the survey. Results show that modern contraceptive use was significantly higher among women in all migration streams (non-migrant urban (OR=2.8, $p<0.001$), urban-urban migration (OR=2.0, $p<0.001$), urban-rural migration (OR=2.0, $p<0.001$), rural-urban migration (OR=2.6, $p<0.001$), rural-rural migration (OR=1.7, $p<0.001$), compared with non-migrant rural women. We conclude that women who internally migrate within Kenya, whether from rural to urban or between urban centres, were more likely to use modern contraception than women living permanently in rural areas. This distinction appears likely due to

a combination of selection theory (migrants are a self-selected group with characteristics different from non-migrants in rural areas, including higher levels of education, later age at marriage, lower pre-migration fertility and participation in gainful employment), adaption theory (socio-cultural norms in the migration destination influences those moving from rural to urban areas), and disruption theory (migration leads to physical separation of sexual partners which in turn helps postpone or space child bearing). Programmatically, the differentials in modern contraceptive use by the different migration streams should be considered when designing family planning programmes among migrant and non-migrant women. It was also evident that certain factors, such as higher levels of education and employment, acted as enabling factors for modern contraceptive use regardless of migration status. Overall, the DHS data available for our analysis were limited, and so there is need for additional research to understand the differentials in contraceptive use between migrant and non-migrant women and come up with strategies and policies to inform future interventions and thereby improve access to and use of modern contraceptives among these various populations (Article 5).

In Article 6 we sought to understand the determinants of modern contraceptive use (by partners and male methods) among sexually active men. We use data from the nationally representative 2014 Kenya Demographic and Health Survey (KDHS) of men aged 15-54 years and restrict our analysis to 9,514 men who reported being sexually active in the past 12 months prior to the survey, as they were likely to report doing something or not to avoid or delay pregnancy. We considered explanatory factors contributing to modern

contraceptive use among sexually active men and their partners. Men with no education, and low awareness of contraceptives were less likely to use modern contraceptives, being poorly informed about contraceptives and their benefits. Men from North-Eastern Kenya lag far behind other regions, with religion and gender attitudes seeming to shape contraceptive behaviours and practice among them. Our analyses suggest that interpersonal communication and mass media have a positive effect on modern contraceptive use by men and their partners. Informative provider-client interactions, as well as access to information through mass media, are linked with better knowledge and increased use of modern contraceptives. Concerted sensitization campaigns should focus on sub-groups of men whose contraceptive use remains low. Additional studies of men are recommended to broaden understanding of the drivers and barriers to contraceptive use among sub-populations of men.

The analyses described in this thesis highlight the barriers/disadvantages that vulnerable women from various backgrounds, such as those living in slums, young girls living in urban areas, migrant women, female sex workers as well as men, face in the use of contraceptives. These barriers include myths and misconceptions, information gaps and misinformation. The analyses have highlighted several evidence gaps, and so we further recommend more research to broaden and deepen understanding of the main drivers and barriers to contraceptive use among these vulnerable populations. Additionally, we recommend additional service delivery strategies be considered to expand access to a broader range of

contraceptives to meet the particular needs of each of these populations.

SAMENVATTING

Deze thesis beschrijft de dynamiek van anticonceptiegebruik bij specifieke kwetsbare populaties in Kenia. Meer specifiek biedt deze thesis een grondige analyse van het thema en geeft ze aanbevelingen voor gezinsplanningsprogramma's en beleidsmakers om aan de specifieke noden van deze populaties tegemoet te komen. We bestudeerden jonge stedelijk vrouwen, vrouwen die ongepland zwanger werden, vrouwen die leven in sloppenwijken en in middenklasse niet-sloppenwijken, vrouwelijke sekswerkers, vrouwelijke migranten en niet-migranten, en seksueel actieve mannen, en gingen de karakteristieken na van degenen die moderne anticonceptiemethoden gebruiken in Kenia.

Het onderzoek naar jonge stedelijke vrouwen werd uitgevoerd in bewust geselecteerde urbane en peri-urbane districten in de Keniaanse provincies Nyanza, Coast en Central. Diepte-interviews werden afgenomen van seksueel actieve vrouwen tussen 15 en 24 jaar uit willekeurig geselecteerde huishoudens, zowel gebruikers als niet-gebruikers van anticonceptie. De resultaten tonen aan dat de respondenten vertrouwd waren met enkele moderne anticonceptiemethoden, en dat de meesten hun algemene werkingsmechanismes konden beschrijven. Condooms werden door veel gebruikers niet beschouwd als anticonceptie. Het gebruik van anticonceptie werd soms geassocieerd met promiscuïteit. Angst voor bijwerkingen en negatieve reacties waren de voornaamste barrières voor gebruik. De belangrijkste angst was dat bepaalde methoden onvruchtbaarheid zouden veroorzaken. Veel angsten waren gebaseerd op mythes en misvattingen. Jonge vrouwen vernemen zowel de echte

als de vermeende bijwerkingen via hun sociale netwerken. Onze bevindingen bevestigen dat kennis van anticonceptie zich niet noodzakelijk vertaalt in gebruik, en dat mythes en misvattingen de voornaamste barrières zijn voor het gebruik van anticonceptie door jonge vrouwen, waarbij zowel gebruikers als niet-gebruikers een gebrek vertonen aan gedetailleerde en correcte informatie over de verschillende anticonceptiemethoden. Ook benadrukken onze bevindingen het belang van de goedkeuring van anticonceptiegebruik door het sociale netwerk en de peergroep, en daarmee ook de noodzaak van het gericht en proactief betrekken van de bredere gemeenschap. We stellen voor om massamedia en peergroep campagnestrategieën in te zetten om mythes te helpen ontkrachten en om accurate informatie over contraceptie te verspreiden onder jonge vrouwen om het volgehouden gebruik van anticonceptie te bevorderen (Artikel 1).

Om de prevalentie van anticonceptiegebruik en de factoren die samenhangen met de keuze van anticonceptiemethode te onderzoeken, verzamelden we gegevens in sloppenwijken en in niet-sloppenwijken. We interviewden 1.873 vrouwen, 926 in sloppenwijken en 947 in middenklasse wijken in Nairobi, Kenia. De keuze van anticonceptiemethoden was gelijklopend in beide settings: iets meer dan een derde (34,4%) van de vrouwen in sloppenwijken en 28,1% van de vrouwen in niet-sloppenwijken gebruikten kortetermijnmethoden. Langetermijnmethoden zoals sterilisatie, IUD en implantaten werden vaker gebruikt door vrouwen in niet-sloppenwijken (9,2%) dan door vrouwen in sloppenwijken (3,6%). Zoals verwacht waren oudere vrouwen minder geneigd om

kortertermijnmethoden te gebruiken, terwijl gehuwde vrouwen meer geneigd waren om moderne anticonceptiemethoden te gebruiken dan traditionele methoden. Vrouwen met drie of meer kinderen gebruikten meer langetermijnmethoden. Vrouwen die buitenhuis of in formeel dienstverband werkten gebruikten meer moderne methoden dan zelfstandig werkende of werkloze vrouwen. Investeringen in verbeterde toegankelijkheid van diverse anticonceptieopties voor vrouwen in zowel sloppenwijken als niet-sloppenwijken zijn dringend nodig om de toegang tot anticonceptie en daarmee de keuzemogelijkheden en het gebruik te verhogen, in het bijzonder bij gehuwde koppels. Het verzekeren van een bredere waaier van diensten die beantwoorden aan de diverse noden van koppels in langdurige of stabiele relaties in zowel sloppenwijken als niet-sloppenwijken is nodig. Sommige vrouwen, in het bijzonder in sloppenwijken, zouden gebaat zijn bij extra bewustmakings- en educatiecampagnes om mythes en misconcepties rond anticonceptiegebruik te ontkrachten (Artikel 3).

De impact van vroegere ongeplande zwangerschappen op het anticonceptiegebruik van vrouwen uit sloppenwijken en niet-sloppenwijken toonde dat Kenia, zoals de meeste landen, nog steeds een hoog niveau van ongeplande zwangerschappen heeft, met voorspelbare negatieve consequenties voor de gewenste gezinsgrootte, de daling van de fertiliteit en de bevolkingsgroei. De kwantitatieve en kwalitatieve data toonden dat vrouwen die een ongeplande zwangerschap hadden 'klaar waren voor verandering', dat ze klaar waren voor het gebruik van moderne anticonceptie. We bevelen uitvoerders van anticonceptieprogramma's aan om prenatale,

bevallings- en postnatale zorgsystemen te gebruiken om vrouwen te identificeren die een ongeplande zwangerschap hebben of hadden, en hen te benaderen met informatie en diensten om een volgende ongeplande zwangerschap te voorkomen. Op die manier wordt de integratie van anticonceptiediensten met moeder- en kindzorgdiensten versterkt. Er is ook nood aan gecoördineerde inspanningen voor het slopen van de barrières die vrouwen ervaren bij het toegang krijgen tot deze diensten. Er zijn bijkomende gegevens nodig om de onderliggende barrières voor moeder- en kindgezondheidsinformatie en –diensten beter te begrijpen (Artikel 2).

Vrouwelijke sekswerkers (VSW) zijn kwetsbaar voor een breed gamma van sociale, seksuele en reproductieve gezondheidsproblemen zoals seksueel overdraagbare aandoeningen (SOA's)/HIV, ongewenste zwangerschappen, uitbuiting, stigma en discriminatie, en geweld. VSW hebben daarom sterke nood aan toegang tot omvattende seksuele en reproductieve preventiemaatregelen. Bestaande programma's besteden desondanks weinig aandacht aan de bredere seksuele en reproductieve gezondheid en rechten van deze vrouwen en focussen vaak op preventie en behandeling van HIV en andere SOA, terwijl ze andere noden zoals toegang tot een breed gamma aan anticonceptiemethoden verwaarlozen. Het doel van deze studie was het onderzoeken van de ervaringen van VSW met bestaande anticonceptiemethoden en van hun rol in toegang en gebruik van anticonceptie. We focusten op vrouwen van 15 tot 49 jaar, die aangaven sekswerk te doen, gedefinieerd als 'seksuele diensten aanbieden in ruil voor geld of andere materiële vergoedingen als deel van hun levensonderhoud'. We stelden vast dat terwijl sommige VSW

bekend zijn met moderne anticonceptiemethoden, anderen er geen idee van hebben of weigeren om anticonceptie te gebruiken uit angst om klanten te verliezen. De interactie met verschillende types van klanten kan voor VSW zowel een barrière als een opportuniteit zijn om anticonceptie te gebruiken. De meeste VSW erkennen het belang van duale protectie voor HIV/SOA en zwangerschap. Er bestaan echter nog steeds hardnekkige mythes en misvattingen die een barrière vormen voor anticonceptiegebruik. Andere barrières zijn de angst om getest te worden op HIV in de anticonceptieklinieken en de lange wachtrijen die kunnen leiden tot het verlies van klanten. We bevelen aan om tegemoet te komen aan de anticonceptienoden van VSW via een multisectoriële benadering en verspreiding via de gemeenschap. We raden ook aan om gerichte raadplegingen te introduceren waarbij informatie gegeven wordt over de voordelen van niet-barrièreanticonceptiemethoden met bijkomende ondersteuningsdiensten voor het beheersen van bijwerkingen, om duale protectie tegen zowel zwangerschap als HIV/SOA aan te moedigen (Artikel 4).

Gebruik van moderne anticonceptiemethoden werd onderzocht bij migranten (vrouwen die verhuisden van platteland naar stad, van stad naar stad of van stad naar platteland) en niet-migranten (vrouwen die in urbane of rurale gebieden blijven). In een land waar regionale verschillen in bevolkingsgroei en armoedebestrijding prioriteiten blijven in de post MDG agenda, is het begrijpen van de relatie tussen anticonceptiegebruik en interne migratie zeer relevant. We gebruikten data van de Keniaanse Demographic and Health Survey (DHS) 2008-09, over 5.905 vrouwen tussen 15 en 49 jaar die aangaven seksueel

actief te zijn geweest in de twaalf maanden voorafgaand aan de survey. De resultaten tonen dat het gebruik van moderne anticonceptiemethoden significant hoger was bij vrouwen in alle migratiestromen (niet-migranten urbaan (OR=2.8, p<0.001), urbaan-urbaan (OR=2.0, p<0.001), urbaan-ruraal (OR=2.0, p<0.001), ruraal-urbaan (OR=2.6, p<0.001), ruraal-ruraal (OR=1.7, p<0.001)) dan bij rurale niet-migranten. We concluderen dat vrouwen die intern migreren binnen Kenia, zij het ruraal-urbaan of urbaan-urbaan, meer geneigd waren om moderne anticonceptie te gebruiken dan vrouwen die permanent in rurale gebieden wonen. Dit onderscheid blijkt te wijten aan een combinatie van selectietheorie (migranten zijn een zelf-geselecteerde groep met andere karakteristieken dan niet-migranten in rurale gebieden, door hun hoger opleidingsniveau, hun later huwelijk, lagere pre-migratie fertiliteit en deelname aan betaald werk), adaptatietheorie (socio-culturele normen in de migratiebestemming beïnvloeden de migranten van ruraal naar urbaan), en disruptietheorie (migratie leidt tot fysische scheiding van seksuele partners, wat bijdraagt tot het uitstellen van zwangerschap). De verschillen in anticonceptiegebruik tussen de verschillende migratiestromen zouden in aanmerking genomen moeten worden bij het ontwerpen van anticonceptieprogramma's voor migranten en niet-migranten. Het was ook duidelijk dat bepaalde factoren zoals een hoger opleidingsniveau en het hebben van werk het gebruik van moderne anticonceptiemethoden bevorderden, ongeacht de migratiestatus. De DHS gegevens die we ter beschikking hadden voor onze analyse waren beperkt, en dus is er nood aan bijkomend onderzoek om de verschillen in anticonceptiegebruik tussen migranten en niet-

migranten beter te begrijpen, en strategieën en beleid te vinden die aan de basis kunnen liggen van toekomstige interventies om toegang en gebruik van moderne anticonceptiemethoden te verbeteren bij de verschillende bevolkingscategorieën (Artikel 5).

In Artikel 6 onderzochten we de determinanten van het anticonceptiegebruik (door partners en mannelijke anticonceptiemethoden) bij seksueel actieve mannen. We gebruikten data van de Kenya Demographic and Health Survey (DHS) 2014 over mannen tussen 15 en 54 jaar en beperkten onze analyse tot 9.514 mannen die rapporteerden seksueel actief te zijn geweest in de twaalf maanden voorafgaand aan de survey, aangezien zij naar verwachting iets zouden rapporteren over het al dan niet nemen van maatregelen voor het vermijden of uitstellen van zwangerschap. We keken naar verklarende factoren die bijdragen tot het gebruik van moderne anticonceptiemethoden bij seksueel actieve mannen en hun partners. Mannen met een lage opleiding die weinig bewust waren over anticonceptie waren minder geneigd om moderne anticonceptiemethoden te gebruiken en waren slecht geïnformeerd over anticonceptiemethoden en hun voordelen. Mannen uit Noordoost Kenia bleken ver achter te liggen op andere regio's, met religie en gender attitudes als beïnvloedende factoren voor hun anticonceptiegedrag. Onze analyses suggereren dat interpersoonlijke communicatie en massamedia een positief effect hebben op het gebruik van moderne anticonceptiemethoden door mannen en hun partners. Informatieve interacties tussen gezondheidswerker en klant, en de verspreiding van informatie via massamedia zijn gerelateerd aan betere kennis en toegenomen gebruik van moderne

anticonceptiemethoden. Gecoördineerde sensibiliseringscampagnes zouden moeten focussen op subgroepen van mannen bij wie het anticonceptiegebruik laag blijft. Bijkomend onderzoek bij mannen is aanbevolen om het begrip van de drivers en barrières van anticonceptiegebruik bij subpopulaties te verbeteren.

De analyses die beschreven worden in deze thesis belichten de barrières/nadelen waarmee kwetsbare vrouwen met verschillende achtergronden, zoals vrouwen die leven in sloppenwijken, jonge vrouwen in steden, migrantenvrouwen, vrouwelijke sekswerkers alsook mannen, geconfronteerd worden bij het gebruik van anticonceptie. Deze barrières omvatten onder andere mythes en misvattingen, gebrek aan informatie en verkeerde informatie. De analyses hebben verschillende kennisleemten aan het licht gebracht, en daarom bevelen we verder onderzoek aan om het begrip van de voornaamste drivers en barrières voor anticonceptiegebruik bij deze kwetsbare populaties te verbeteren. Ook raden we aan om bijkomende dienstverleningsstrategieën te overwegen om de toegang tot een breed gamma van anticonceptiemethoden te verbeteren en tegemoet te komen aan de specifieke noden van elk van deze populaties.

CHAPTER ONE

Introduction

This chapter presents an introduction and review of literature on predictors, determinates and barriers to family planning (FP) in the world and Kenya specifically. It starts by presenting the context of family planning in the world and narrows to the case of Kenya. Several studies have been reviewed to contextualize the practice of family planning and inform implementers, policy makers and academicians on the different aspects of FP program implementation.

1.1 Background

Since the 1990's, the world has witnessed a decline in maternal mortality ratio (MMR; number of maternal deaths per 100,000 live births) by 44% between 1990 and 2015, from 385 to 216 maternal deaths per 100,000 live births [1]. Although the goal of 75% reduction by 2015 was not met, the improvement was significant. There was an increase in the number of women receiving antenatal care, more births were assisted by skilled health personnel, fewer adolescents are having children, and family planning use also increased [2, 3]. Maternal mortality remains an important indicator for improvement of health and a country's development. Its reduction has been at the center-stage of the Millennium Development Goals (MDGs) and now of the Sustainable Development Goals (SDGs). In 2000, the United Nations (UN) Member States pledged to work towards a series of Millennium Development Goals (MDGs), including the target of a three-quarters reduction in the 1990 maternal mortality ratio, to be achieved by 2015 [1]. This target, in addition to that of achieving universal access to reproductive health formed the two targets of MDG 5: Improve maternal health. Building on the momentum generated by MDG 5, the SDGs establishes a transformative new agenda for maternal health towards ending preventable maternal mortality and seeks to reduce the global MMR to less than 70 per 100,000 live births by 2030 [1, 4].

However, it is estimated that globally, about 800 women die every day due to preventable pregnancy and childbirth-related complications with the majority occurring in Africa and South Asia [2, 5]. For each woman who dies, 20 more suffer serious injuries or permanent

disabilities such as fistula [1]. The rate of maternal deaths in developing regions is 14 times higher than that in developed regions. It is also reported that just 10 countries account for about 60% of all maternal deaths: India (50,000), Nigeria (40,000), the Democratic Republic of the Congo (21,000), Ethiopia (13,000), Indonesia (8,800), Pakistan (7,900), the United Republic of Tanzania (7,900), Kenya (6,300), China (5,900) and Uganda (5,900). Maternal deaths are preventable with increased access to reproductive health services, reducing the number of adolescent births and unplanned pregnancies through effective family planning services which will increase contraceptive uptake thereby help in lowering maternal mortality [6, 7].

Globally, contraceptive prevalence rate of modern methods is 57%, but remains as low as 30% in low income countries [8]. An estimated 214 million (155 million use no method and 59 million use traditional methods) women in the developing world are not using a modern method of contraception but would like to prevent pregnancy. This figure is slightly lower than the 225 million with unmet need in 2014 [3]. Women with unmet need results to 89 million unintended pregnancies, 30 million unplanned births and 48 million induced abortions [9]. Haemorrhage, hypertensive disorders, sepsis, and unsafe abortion are the top four leading causes of maternal mortality worldwide [10].

It is estimated that 89 million unintended pregnancies occur each year in low-income countries. Most of these pregnancies occur among women who want to avoid a pregnancy but are not using a contraceptive method and women who are using traditional

contraceptive methods, with just a few among women who use modern methods. Each year in the low income countries, it is estimated that unintended pregnancies result in an estimated 30 million unplanned births, 48 million induced abortions, 10 million miscarriages and one million stillbirths [3, 11, 12]. For a woman, the ability to decide whether and when to have children is critical, not only for her own health but also for social and economic well-being, and that of her children, her family, and, more broadly, her community as a whole [13]. Family planning programmes must therefore enable couples and individuals have the right to decide freely and responsibly the number and spacing of their children through the provision of a wide range of effective contraceptive methods and access to information. Governments are obligated to ensure access to a wide range of contraceptive methods by removing legal, financial, informational and other barriers and avoid restricting the right of women and men to make free and informed choices on the number of children they want, and when they want them [14].

Recommendations at the International Conference on Population and Development (ICPD) in 1994 recognized the need for governments to provide appropriate contraceptive methods for couples and individuals to meet their reproductive health needs as defined by age, parity, family size among other factors [15-17]. Effective contraceptive use is achievable when men and women have information and gain access to the widest possible range of safe and effective family planning methods to enable them exercise free and informed choice. Despite these commitments, most low-income countries offer limited choice

of contraceptive methods thereby limiting couples' ability to choose a method that best suits their needs [18]. Furthermore, the situation is sometimes worsened by constant stock outs of the various method types further heightening women's vulnerability [19]. Studies have shown that restricted choice of contraceptive methods result in lower contraceptive prevalence, and each augmenting additional method choice has been shown to contribute to high contraceptive prevalence, thus, broadening contraceptive choice, is beneficial as it increases uptake and consequently higher prevalence [20]. Other known barriers to contraceptive uptake are physical and psychological and may involve concerns around access which include inability to pay, lack of transportation to the heath facility, poor quality of services, and inaccessible clinic hours [21].

Additionally, lack of knowledge about available contraceptive options, perceived risk of pregnancy, negative attitudes towards contraception, unfounded myths and misconceptions, lack of communication between sexual partners and peers are likely to contribute to sub-optimal use of contraceptives [21-23]. Increasing access to more effective contraceptive methods and addressing barriers for use is thus a necessary step towards reducing unintended pregnancy and its consequences. Effective use of contraceptives is influenced by proper use and adoption of effective modern methods [7, 24].

1.2 Contraceptive Use: Global Overview

Contraceptive prevalence - generally defined as the proportion of women of reproductive age using a contraceptive method - among women of reproductive age who are married or in a union varies between 4% and 88% in low and high-income settings such as South Sudan and Norway respectively. Globally, contraceptive prevalence is estimated at 57%-64% in 2015 [25]. In 49 least developed countries, 36 per cent of married or in-union women are using a contraceptive method while the level is nearly twice as high in other developing regions at 66%. Among developing regions, contraceptive prevalence is lowest in sub-Saharan Africa at 25% compared to 50% or more in other parts of the developing world. Among contraceptive users, 9 out of 10 use modern methods with female sterilization being the most common method used by 19% of women aged 15-49 years [25, 26]. The IUD is the second widely used contraceptive method at 14%, the pill is the third most used method in the world at 9% but remains the most preferred method in most African countries [27]. Overall, short-acting and reversible methods are more commonly used than other methods in developed regions whereas long-acting and highly effective clinical methods are widely used in the developing regions [2, 28, 29].

Generally, contraceptive use has increased in many parts of the world, especially in Asia and Latin America, but continues to be low in sub-Saharan Africa. Globally, the use of modern contraception has risen slightly, from 54% in 1990 to 57%-64% in 2015 [25]. Regionally, the proportion of women aged 15-49 reporting use of a modern

contraceptive method has risen minimally or plateaued between 2008 and 2014. In Africa it went from 23.6% to 27.6%, in Asia it has risen slightly from 60.9% to 61.6%, and in Latin America and the Caribbean it rose slightly from 66.7% to 67.0% [26]. It is estimated that 214 million women in low-income countries would like to delay or stop childbearing but are not using any method of contraception [3]. The reasons given by these women include limited choice of methods, limited access to contraception, particularly among young people, poorer segments of populations, or unmarried people, fear or experience of side-effects, cultural or religious opposition, poor quality of available services, users and providers bias, and gender-based barriers [21-23]. The unmet need for contraception (women who would prefer to avoid a pregnancy but are not using any form of contraception) therefore remains high [13, 30, 31]. In Africa, 23.2% of women of reproductive age have an unmet need for modern contraception. In Asia, and Latin America and the Caribbean - regions with relatively high contraceptive prevalence - the levels of unmet need are 10.9 % and 10.4%, respectively [32].

1.3 Contraceptive Use: Sub-Saharan Africa

Promotion of family planning in countries with high birth rates has the potential to reduce poverty and hunger and avert 25-35% of all maternal deaths and nearly 10% of childhood deaths. It would also contribute substantially to women's empowerment, achievement of universal primary schooling, and long-term environmental sustainability [33, 34]. When given a choice to decide when to have children, women generally opt for smaller families. Access to

contraceptives for women contributes productivity in building their economies and political processes [34]. In the past 40 years, family-planning programmes have played a major part in raising the prevalence of contraceptive practice from less than 10% to 60% and reducing fertility in low-income countries from six to about three births per woman. However, in half of the 75 larger low-income and lower-middle income countries (mainly in Africa), contraceptive practice remains low and fertility, population growth, and unmet need for family planning are remain exceptionally high [33]. The Millennium Development Goals make greater emphasis on investment in family planning especially in low-income countries. Despite the low contraceptive prevalence rates and its impact both on maternal mortality and child health in low income countries,, international funding and promotion of family planning is waning, more so, over the past decade [35].

It is estimated that about 89 million unintended pregnancies occur in the developing world, of which, 84% are due to non use of contraceptives and failure of traditional methods, known to be less effective. A few (16%) women using modern methods also report unintended pregnancies either as a result of user-related failures or method-related failures [3]. Yet, the consequences of unintended pregnancy include unwanted childbearing, unsafe abortions and maternal and newborn morbidity and mortality.

Overall, use of modern contraceptives in sub-Saharan Africa among women of reproductive age is at 27.6%, although 42% of the women desire to avoid a pregnancy. Even with this, there is variability in

uptake of contraception in SSA. In Southern Africa, contraceptive use is at 58% with majority of the women reporting modern contraceptive use, while unmet need is 16%. In Western Africa, only 8% of the women report modern contraceptive use, another 5% report use of traditional methods and unmet need is 23%. In Eastern Africa, contraceptive use is 27% with the highest unmet need being in Uganda at 41% [35, 36].

1.3.1 Overview of Barriers to Contraceptive Use

The success of a family programme is measured through family planning indicators such as the percentage of women using modern family planning, the percentage with unmet need for family planning (for spacing and limiting), the percentage of women with unwanted pregnancy and the percentage of women with mistimed pregnancy which are all important determinants of the pace of fertility decline. A vast majority of women in low income countries still grapple with barriers to utilization of family planning despite firm commitments made at the 1994 International Conference on Population and Development (ICPD) where countries were called upon to identify and remove all major barriers to the utilization of family planning services [37].

Majority of the 214 million women in the low-income countries with unmet need for family planning make an overwhelming majority of the 80 million unintended pregnancies that occur there each year. Only a small percentage of the unintended pregnancies are due to inconsistent method use or method failure. It is estimated that the number of unintended pregnancies among women from low-income

countries would reduce by 71% if these women begun to use modern methods of contraception [3]. The reasons women who would like to avoid a pregnancy but are not using contraception give vary from concerns about health risks including side effects, infrequent sex, postpartum amenorrhea or breastfeeding, opposition from their partners or others close to them, and believing they were infertile. Only a small percentage of women mention lack of access or high cost of contraceptives as a barrier to use [38]. Data from selected countries reporting unmet need for contraception and citing specific reasons for not using contraception is shown in the table below:

Table 1: Percentage of married women with unmet need citing specific reasons for not using contraception, 2005-2014

	Sexual activity and fecundity			Opposition			Access			Method related
Country	Infrequent/ no sex	Postpartum amenorrhea/ breastfeeding	Subfecund	Woman opposed	Partner/ others opposed	Anyone opposed	Unware of methods	Cost too high	No sources/ access	Side effects/ health risks/ inconvenience
Ethiopia	8	30	1	18	8	25	4	0	6	30
Kenya	14	12	2	7	9	16	2	3	6	44
Tanzania	18	14	0	12	12	23	1	2	4	45
Uganda	14	28	3	14	12	25	1	2	6	36
Rwanda	17	37	1	14	4	17	0	0	0	25
Malawi	22	24	2	9	6	15	1	1	2	24
Mozambique	23	30	4	24	10	33	1	6	7	9
Namibia	11	15	4	12	11	20	2	8	7	28
Swaziland	11	9	3	7	12	19	1	3	1	46
Zambia	17	27	7	7	10	17	1	1	5	33
Zimbabwe	38	13	4	15	7	22	0	5	4	14

Source: [38]

1.3.2 Key Barriers to Contraceptive Use

Sexual activity and fecundity

Perception of the risk of pregnancy is a major reason for non-use of contraceptives. Women who report infrequent or no sex perceive their risk of getting pregnant as little. This reason is cited by about 20% of married women in Africa and the reason was higher among

women from countries with a higher contraceptive prevalence. Further analysis shows that about half the women who report infrequent sex were actually sexually active and only 23% were not sexually active in the past three months, which confirms the risk of unwanted pregnancy by these women [38]. The women who report postpartum amenorrhea or breast feeding as a reason for not using contraception believe their risk of becoming pregnant is minimal. A small percentage of women also believe they are not able to become pregnant and therefore do not see the need to use contraception.

Opposition to contraception

In general, opposition to contraception is mainly due to personal beliefs or belief of spouse and those close to the woman who influence her decision to use contraception. Majority of married women cite their own opposition or that of their spouse as the main reason for non-use. Women from strongly patriarchal societies may face the biggest opposition to contraceptive use as they require approval from their partners and mothers' in-law. In some African cultures, a woman's acceptance by her husband and in laws was determined by the number of children she bore which is incompatible with contraceptive use which is believed would the woman infertile. Men would want their wives to bear as many children as possible since children are viewed as a form of the man's wealth and insurance in times of adversity, especially death of other children [39]. Opposition of contraceptive use from male partners is reported by studies conducted in Tanzania [40] and Uganda [41] where the women reported that contraceptive use against the wishes of their male

partners could lead to violence or divorce. Friends and social networks also have an influence on use and non-use of contraceptives among women. A study by Ochako et al. 2015 found that the influence of social networks is strong and is a major barrier to contraceptive use among young women who often rely on approval by their peers. [22]. In Nigeria, a study among young women found contraceptive use to be strongly influenced by the level of support or lack of it from people in the woman's social network [42].

Lack of knowledge

Contraceptive knowledge is not a major barrier for use as over 90% of the women know at least a method of contraception. In most surveys, women could name various methods such as condoms, injectables, the pill among others. However, the main barrier may be knowledge about the mechanisms of action for specific methods of contraception. For instance, a study among the young women in Kenya found that while majority of them knew the various methods of contraception, some could not tell how they appropriately worked. Woman made reference that the pill as inserted in the vagina to prevent pregnancy. In another scenario, a woman reported that the coil was inserted in the body after 'cutting the area open, insert and stitch it back' [22]. In a study conducted in Nigeria, some women had limited knowledge on how condoms and withdrawal method work. They reported that since condoms are artificial and withdrawal natural, both have similar efficacy, but argued strongly in favour of the withdrawal method [42].

Lack of access

Lack of access is given by women who do not know a source, are not able to get to a source due to distance or lack of transportation or both. Cost also includes the expenses in purchase of contraceptives. A study conducted in Africa found that 97% of the users would be unable to pay the full cost of contraceptives if they were not provided for free or at a subsidized price [43, 44]. Sustained contraceptive use will be impaired with the perception that they are expensive. The IUD for instance is perceived as the most expensive, some women even reported non-use because of the increasing cost of contraceptives from outlets such as pharmacies and chemists in Nigeria. Distance is a major barrier to women from rural setups who have to travel longer distances to access the services from the available health centers [42, 45].

Method related concerns

The most cited reasons for unmet need are side effects, these could be health related side effects or mere inconveniences. Most common side effects include excessive bleeding, spotting, lack of sexual desire, weight gain, headaches, and blood pressure [22, 46]. Most of these side effects are cited by women who use injectables, IUD and oral contraceptives. Lack of accurate information together with side effects and misinformation can create fear based on rumours that some contraceptive methods can cause cancer. Others concerns are that the IUD can float in the womb and cause birth defects and that injectables can cause infertility and should only be used by women who have given birth [22, 44]. Additionally, men are misinformed about side

effects and perpetuate the fear of side effects which they assume will affect their partners. Men rarely seek factual information on contraceptives from reputable sources thereby perpetuating the fears and misconceptions on family planning that extend to their partners [40].

Provider related barriers

Health care providers are sometimes influenced by their personal prejudices which deny clients an opportunity to access a method of their choice. For instance, a study in Ghana reported that the providers emphasized the side effects of the pill rather than offering it first as a choice of contraceptive. Other restrictions that providers impose before they offer contraceptives to clients include marriage, and minimum age requirements which act as barriers to contraceptive uptake [44, 47]. In Zambia, young people seeking emergency contraception (EC) from clinics found providers to be unwelcoming and judgmental [48, 49]. A study conducted in Kisumu, Kenya found that providers failed to greet clients in a respectful or friendly manner and generally displayed negative attitudes towards clients [50]. Studies have also found that clients who were served by providers who were respectful and friendly were more likely to continue using family planning services [51-53].

1.4 Global Population Policies

A population program is an enactment of nationally defined policies or strategies to outline the demographic trends and patterns. It can include legislative, regulatory, and programmatic mechanisms that directly influence size, distribution, composition, and population

growth. It can also address, the three population dynamics – mortality, migration and fertility – at both macro and micro levels [54]. Fertility control has been at the center-stage in the design and implementation of population policies and programs.

The United Nations played a key role in creating global awareness on population problems and the need to integrate national population policies. Between 1945-1970, population and development started to emerge as an international concern. However, many countries lacked data to show population trends therefore making it difficult to explore the relationship between population and development. Through requests for technical assistance from countries such as Brazil, India, Indonesia and Thailand, the United Nations established a programme for technical assistance on population matters but focusing on family planning activities [55]. Later in 1954, the United Nations organized the World Population Conference in Rome where the importance of demographic research to inform population policy was discussed. Evidence gathered in the years that followed led developing countries to realize the importance of investing in their population then characterized by high birth rates and a youthful population by introducing family planning [56].

India had adopted a national population policy in 1951 followed by Pakistan, the Republic of Korea, China and Fiji during the 1960-62 period. Majority of other developing counties did not legislate on national population policies until the late 1960s and early 1970s. The second world population conference was held in 1965 in Belgrade following calls for increased research on the link between population

growth and economic growth by the United Nations. In 1970, the United Nations Fund for Population Activities (UNFPA) was formed to respond to requests for technical assistance on population matters. UNFPA's mandate was to:

> "…promote awareness, both in developed and developing countries, of the social, economic and environmental implications of national and international population problems, of the human rights aspects of family planning, and of possible strategies to deal with them in accordance with the plans and priorities of each country; [and] to extend systematic and sustained assistance to developing countries at their request in dealing with their population problems; such assistance to be afforded in forms and by means requested by the recipient countries and best suited to meet the individual country's needs (ECOSOC Resolution 1963 (LIV) of 18 May 1973).

The 1974 Bucharest world population conferences saw debates on the role of population in development with African delegates taking pro-natalist positions. For the first time, the participants were Government representatives and political leaders. The discussions were around rapid population growth as the reason for slow economic growth. It was recommended that each country recognizes, 'the right of persons to determine in a free, informed and responsible manner, the number and spacing for their children'.

The 1984 Mexico conference discussed the linkage between population and development with the issue being less divisive among developed and low-income countries. At the 1994 International Conference on Population Development in Cairo, delegates turned their attention to micro-level rationales for population's role in development by discussing and endorsing the right of individuals and couples to choose the number, timing of children and to have access to information and means of doing so [54, 57].

Poor country governments, either responding to external stimuli (development assistance) or internal deliberations developed national family planning programmes to persuade couples to limit their family size, and space children through provision of modern contraceptives. Family planning programs had a goal to promote the adoption of modern methods of contraception by availing a wide range of methods from which individuals and couples could choose. This choice, of a contraceptive method, is influenced by motivations for pregnancy prevention (delaying, spacing and stopping), concerns about sexually transmitted infections (STIs) and cultural acceptability of the methods available [58, 59].

1.5 The case of Kenya

1.5.1 Population Policies in Kenya

Kenya was among the first sub Saharan African countries to adopt a population policy in 1967 in an attempt to control its rising population growth [22, 60, 61]. This was in part due to the need to control its

own population growth and also be part of the international population agenda at the time. Kenya's population growth increased from 2.5% in 1948 to 3.8% in 1979, later decreased to 2.8% in 1999 and further went down to 2.1% in 2007 [62]. Although the population policy was adopted in the late 1960's, Kenya begun to actively implement the plan in the early 1980's when there were concerted efforts from the government to control the population growth. This resulted in the decline of the population growth rate from 3.3% to 2.8% per annum. Total fertility rate also declined from about 8 to 5 children per woman in the 1990's. Contraceptive use among married women of reproductive age almost doubled to 39% from 17%. The desired family size also declined from 6 to 4 children per woman during this period. Conversely, infant and child mortality increased from 63 to 74 and 90 to 112 deaths per 1,000 live births respectively between 1984 and 2010. Life expectancy also continued to decline from 62 years in 1984 to 57 years in 2010. In part, this loss was due to the ravaging HIV/AIDS epidemic which had devastating effects on the lives of Kenyans [63].

The population policies were broad-based and aimed at regulating Kenya's population growth and sustainable development. The most notable achievements of the population policies include reduction in the inter-censal population growth rate to 2.9% in the period 1999 and 2009, decline in total fertility rate from 4.9 to 4.6 between 1998 and 2009, decline in infant mortality rate from 74 to 52 deaths per 1,000 live births between 1998 and 2009, another decline in under five mortalities in the same period from 112 to 74 deaths per 1,000 live

births in 2010. National immunization coverage also increased from 65% to 77%, contraceptive prevalence rate among married women increased from 39% to 46% while universal knowledge of family planning methods remained at over 97%. While the ideal family size remained unchanged at 4 children per woman, life expectancy declined to 57 years partly due to HIV although the HIV prevalence reduced from 6.7% to 6.3% between 2003 and 2009 [61, 63].

Table 2: Key Achievements

Method	1984	2000	2010	2000-2010 (% change)
Annual population growth rate	3.3	2.8	2.9	3.6
Total fertility rate	6.7	4.9	4.6	-6.1*
Infant mortality rate	63	74	52	-29.7*
Child (Under-5) mortality rate (per 1,000 live births)	90	112	74	-35.7*
Contraceptive prevalence rate	17	39	46	17.9
Family planning knowledge	81	95	95	0
Desired family size	5.8	4.3	2.8	-11.6
Life expectancy (years)	62	61	57	-4**
HIV prevalence	-	6.7	6.3	-6

**The desired change* ***The undesired change*

Source: Census report, KDHS report - Adapted from NCPD, 2012

The role of the private and non-governmental organizations in increasing access to family planning among the general Kenyan public cannot be underestimated. Under the coordination of the National Council for Population and Development, various partner activities in promotion of family planning were guided through the formulation of policies and strategies to guide their programmes [64]. The government also developed guidelines and standards for family planning service providers to ensure quality of the services provided, educate clients and help determine the best method that meets the

client needs. These guidelines were later reviewed and incorporated into the 1997 reproductive health/family planning policy. The policy identified the provision of quality and sustainable family planning services to help reduce unmet need for family planning [64, 65]. The results have been sustained increase in contraceptive use and prevalence thereby making Kenya among the countries with the highest contraceptive prevalence in sub-Saharan Africa at 58% [61, 66].

1.5.2 The Family Planning Program in Kenya

The government of Kenya has developed population policies, strategies, and programs to address population management challenges with the goal of strengthening demand and supply for FP services. Kenya was the first country in sub-Saharan Africa to establish a National Family Planning Program in 1967. In the 1980s and early 1990s there was a strong political will and contraceptive use increased leading to a decline in TFR from 8.1 children per woman in 1978 to 4.7 in 1998. However, the family planning programme struggled in the late 1990s due to a shift in donor funding from family planning to the HIV pandemic. This led to a stall in TFR that lasted over a decade [63].

Later, guidelines on implementation of an expanded population program were developed under the Population Policy Guidelines in Sessional Paper No. 4. Sessional Paper No. 1 of 2000 of the National Population Policy for Sustainable Development integrated the International Conference on Population and Development (ICPD) Program of Action following the 1994 ICPD held in Cairo, Egypt. Although Sessional Paper No. 3 of 2012 on Population Policy for

National Development succeeds Sessional Paper No. 1 of 2000 on National Population Policy for Sustainable Development, it presents a policy framework whose goal is to attain a high quality of life by managing population growth to a level that can be sustained with the available resources. The principal objective of the policy is to provide a framework that will guide national population programs and activities for the next two decades. It considers national and international emerging and continuing population concerns. It also responds to Kenya's development agenda as contained in the Kenya Vision 2030 blueprint and the 2010 Constitution of Kenya [67, 68].

Additionally, there was an enabling policy environment for the implementation of population-related programs and projects, such as the Kenya Vision 2030 and the establishment of the National Council for Population and Development (NCPD) to address and coordinate population and development issues. The government continues to work closely with development partners, non-governmental organizations, community-based organizations, faith-based organizations, and private sector and other key players in the population and development sector who have been proactive in supporting family planning (FP), and reproductive health (RH), programs [67].

The Constitution of Kenya (2010), the Kenya Vision 2030, Kenya Health Policy (2012-2030), the National Reproductive Health Policy (2007), the Kenya Health Sector Strategic Plan (2013–2017), identify FP as a key pillar in the development and improvement of the health status of women and their families [68-70]. The most recent Kenya

Demographic and Health Survey (KDHS) of 2014 reports that 58 percent of currently married women are using a method of FP. Modern FP methods are more commonly used (53 percent) than traditional methods (5 percent). Injectables are the most widely used method (26 percent), followed by implants (10 percent) and the pill (8 percent). Use of any method of FP was high among sexually active unmarried women (65 percent) and currently married women (58 percent). More sexually active unmarried women (61 percent) reported the use of modern FP methods, compared to currently married women (53 percent). Overall, there was an increase in the use of modern methods of FP among married women, from 39 percent in 2008–2009 to 53 percent in 2014 [62, 66].

Unmet need for contraception increased between 2003 (24.5 percent) and 2008–2009 (25.6 percent), as reported by KDHS. However, unmet need for contraception decreased to 18 percent (9 percent for spacing and 8 percent for limiting) according to the 2014 KDHS [62, 66, 71].

1.5.3 Implementation of Family Planning Programmes in Kenya

The Government of Kenya made a commitment to provide equitable and affordable quality reproductive health including family planning services information and supplies to its segments of the population who need them. This commitment is contained in the Sessional Paper No. 3 of 2012 on Population Policy for National Development. The target is to increase contraceptive prevalence rate from 58% in 2014 to 70% in 2030 [63].

Additional commitments were made by the Government of Kenya at the 2012 London Summit on family planning to increase budgetary allocation for family planning through a partnership dubbed Family Planning 2020 (FP2020). FP2020 is a global partnership that supports the rights of women and girls to decide, freely, and for themselves, whether, when, and how many children they want to have [72]. FP2020 works with governments, civil society, multi-lateral organizations, donors, the private sector, and the research and development community to enable 120 million more women and girls to use contraceptives by 2020. Governments made commitments to address policy, financing, delivery and socio-cultural barriers to women accessing information, services and supplies. The pledges Kenya made and progress made is as highlighted below.

Table 3: Tracking FP2020 pledges

Kenya's FP2020 pledges	Government of Kenya's progress on its FP2020 pledges	What has civil society achieved?
Every person has the right to the highest attainable standard of health	• Implemented legal and policy frameworks, and allocated budget to FP, which contributed to 1,000 new health facilities. • Failed to act on the severe shortage of health workers and poor working conditions in the health sector and to take action to recruit 12,000 health workers; as promised at the Human Resources for Health Conference in 2013 (Brazil).	• Advocated for FP budgets in Kisumu and Busia • Supported the development of the Busia reproductive health strategy • Demanded that sexual and reproductive health and rights (SRHR) be prioritized in the proposed health bill, currently under consideration by the national assembly.
Enhance the participation of local communities in the Health Sector Services Fund (HSSF)	• Collaborated with pharmaceuticals companies and NGOs to improve the reproductive health commodity supply chain. • Public health facilities now offer Implanon NXT (long-acting contraceptive). • Conducting public consultations and discussing budget allocation for the Health Sector Service Fund with civil society.	• Organized civil society consultations in four counties. As a result, underserved groups have better awareness of the Health Sector Service Fund. • FHOK and the CSA shared the results of these consultations with county health management teams.
Scale up the voucher system for health care in five counties	• Expanded the voucher system to an additional seven districts (in Kisumu county: Nyando, Nyakach, Muhoroni; in Kitui county: Mwingi, Kyuso, Mumoni and Tseikuru)	• Advocated for the voucher system to be introduced in an additional five counties. • Testing the voucher model in two areas (Kisumu and in the Coastal region).
Establish a Youth Empowerment Centre in each constituency	• Established 48 new facilities for youth empowerment centres by 2014, but these facilities are being used for other purposes. • Failed to operationalize the Adolescent Reproductive Health Policy (2015).	• CSA is demonstrating a model youth centre to government actors and conducting an audit of existing Youth Empowerment Centres. • FHOK is implementing advocacy initiatives related to youth-friendly services in nine counties.

The Government of Kenya has made progress in achieving its policy, financial and program and service delivery commitments to FP2020 as follows:

- The voucher system, originally committed to as part of the Government of Kenya's 2012 commitment to Family Planning 2020, has been replaced by the free maternal health care which is provided in all public health facilities
- No new youth empowerment centres have been established, but information and communications technology services have been scaled up in existing empowerment centres. However, provision of reproductive health services is still weak due to the lack of youth-friendly services in these centers

- The change in governance structure to devolution has increased participation of local communities in decisions making at the local level. Health services are devolved and county health managers are directly involved in formulating their health priorities. Public participation is ensured through representation by the members of the county assemblies as well through public hearings during budgeting process. The national government continued to provide resources to health facilities through the Health Sector Services Fund which is managed by local committees

Advocacy continues to encourage more women to use family planning as well as to dispel myths and misconceptions. This is done through the media, peer groups, mobilization for out-reach services and by observing global days such as the World Contraception Day. The Government of Kenya had a temporary loss of the family planning budget line following devolution of health functions to County governments, however, this is being addressed and the government allocated USD $500,000 as a line item for family planning commodities in the year 2015-2016, [and] this will be scaled up in coming years [73].

1.5.4 No Coercive Family Planning Programmes in Kenya

Coercion in family planning consists of actions or factors that compromise individual autonomy, agency or liberty in relation to contraceptive use or reproductive decision making through force, violence, intimidation or manipulation [74]. Unlike countries such as

India and Peru that had coercive family planning programmes to control the number of births, the family planning programme in Kenya is trying to control population by urging women to change their desire for children. The average number of children per woman has fallen from 8 children per woman in the early 1980's to about 4.5 children in 2014 [66]. Despite the fall in number of children, the Government intends to reduce fertility to about 2.6 children per woman by 2030 [75].

The proponents of the demographic theory state that as a country develops fertility drops because of a mix of factors such as urbanization, reduction in child mortality among other factors. The fertility transition witnessed in Kenya has been a result of development and specifically the downward trend in child mortality. Despite the gains in fertility, the government through the recent policies and as outlined in the Kenya vision 2030 seeks to see a further reduction in fertility. On the other hand, experts argue that Kenya's fertility remains high despite knowledge of at least one method being virtually universal, 98% among women, and 99% among men. However, this knowledge has not necessarily translated to use. The most recent DHS conducted in 2014 reports that only 53% of the woman are using a modern method of contraception [66]. Moreover, 18% of women report unmet need with the most cited reasons being method related reasons, especially fear of side effects (17%) and health concerns (12%), fertility-related reasons including menopause (13%), desire for many children (9%), and infrequent sex (9%). Religious prohibition and

opposition to use each accounted for 9% of women's reasons for not intending to use a family planning method in the future [66].

Therefore, it is evident that majority of the women who have unmet need for family planning have no intention to use contraceptives even if they were made free and more accessible since those who give this reason for non-use were only 0.1%. Perception lingers that family planning programs throughout the low-income countries still place undue pressure on families, and particularly on women, to conform to reproductive norms imposed by governments. In Kenya, doctors from the catholic church accused the government of introducing a fertility reduction program targeting women of child bearing age through a neonatal tetanus program. The United States Aid (USAID) a development partner and major donor of the family planning programme in Kenya introduced a performance based incentive (PBI) program for family planning. The program offers cash incentives for health workers who provide long acting contraceptives and who meet certain set annual targets. These targets are more likely to increase uptake by modifying the women's behaviour by increasing access or subsidize costs which are not the main barriers to contraceptive use. Another example of a coercive program in Kenya is the 'cash for contraception' program which was undertaken by a US based organization that was offering Kenyan women living with HIV $40 to get IUD, a long-term contraceptive. The program's idea is to prevent mother-to-child transmission of HIV by giving incentives to woman living with HIV not to have children. Women living with HIV face widespread stigma and discrimination and with the high

unemployment rate in Kenya, the offer for money may be luring to them [76].

1.5.5 Organization and Delivery of Contraceptive at the Health Facility Level

Health care sector in Kenya is mainly comprised of the public system, with major players being MOH and parastatal organizations, and the private sector, which includes private for-profit, NGO, and FBO facilities. Health services are provided through a network of over 10,062 health facilities countrywide, with the public sector system accounting for about 51% of these facilities [77]. The public health system consists of the following levels of health facilities: national referral hospitals (tertiary or level 6), County referral hospitals (secondary or level 5), sub-County hospitals (primary or level 4), health centres (primary or level 3), dispensaries (primary or level 2) and community units (primary or level 1).

National referral hospitals are at the apex of the health care system, providing sophisticated diagnostic, therapeutic, and rehabilitative services. County referral hospitals act as referral hospitals to their sub-County hospitals. They also provide very specialized care. The County referral hospitals acts as an intermediary between the national central level and the sub-County. They oversee the implementation of health policy at the sub-county level, maintain quality standards, and coordinate and control all district health activities. Sub-County hospitals deliver health care services and generate their own expenditure plans and budget requirements based on guidelines from the County hospitals. The network of health centres provides many

of the ambulatory health services. Health centres generally offer preventive and curative services, mostly adapted to local needs. Dispensaries and community units are meant to be the system's first line of contact with patients, but in some areas, health centres or even hospitals are effectively the first points of contact. Dispensaries provide wider coverage for preventive health measures, which is a primary goal of the health policy in Kenya. The government health service is supplemented by privately owned and operated hospitals and clinics and faith-based organizations' hospitals and clinics, which together provide between 30 and 40 percent of the hospital beds in Kenya [78].

FP services can be provided at various levels of the health care system (e.g., from community to tertiary care levels) and within facilities that are operated by varying providers e.g., public, faith-based, private). However, certain standards must be met before providers can offer a particular FP method [79].

Table 4: FP Provision at the Health Facility

Service delivery level	Services providers	FP services
Level 1 (Community)	CHWs, CHEWs, and community midwives	FP services: counselling and provision of condoms and referral for other methods; encouraging male involvement; record keeping and reporting FP counselling, condoms and referral. Post-abortion care
Level 2 (Dispensary)	Nurse/midwife, public health	FP counselling and provision of condoms, pills and injectables,

	technician, CHEWs	and implants, IUCD in some facilities (subject to training) and referral for other methods. Post-abortion care
Level 3 (Health Centre, Maternity Home, Nursing Home)	Doctor (outreach Clinical Officer), Nurse/midwife, Public Health Technician CHEWs	FP counselling and provision of condoms, pills and injectables, implants, IUCD in some facilities (subject to training), BTL/VS as outreach service, referral for other methods Post-abortion care
Level 4 (primary hospital, sub-district hospitals, district, and mission hospitals)	Doctors, Clinical Officer, Nurse/midwife, Public Health Officer or Technician	FP counselling and provision of full range of FP methods
Level 5 and 6 secondary/tertiary, county, and referral hospitals)	Doctors (including specialists) Clinical Officer, Nurse/midwife	FP counselling and provision of full range of FP methods.

1.5.6 Provision of FP methods by different service providers

Various categories of health care providers are involved in the provision of FP services after receiving the necessary training and instruction. Additionally, certain standards must be met before providers can offer a particular FP method. For instance, while condoms and oral contraceptives can be provided anywhere, special conditions must be fulfilled before surgical methods are provided in a health facility. The table below provides information on the range of FP methods that each category of service provider working in Kenya may provide [79].

Table 5: Provision of FP methods by various service providers

Provider/ Method	Male condom	Female condom	LAM	Pills (COC, POP)	Injectable	IUCD	Implant	Standard Days Methods (SDM)	Other FAMs (Two Days Method, Ovulation)	Female and male sterilization
Medical doctor	Trained medical doctors can provide full services related to the above									
Nurse midwife	Trained nurse-midwives (including community midwives) can provide full range of services related to the above									Counsel, refer
Clinical officer	Adequately trained registered Clinical Officers (RCOs) can provide full range of services related to the above									Counsel, refer
CHEW	Community Health Extension Workers (CHEWs) provide and interface between Community Health Workers (CHWs) and Service Delivery Points (SDPs)									
CHW	Counsel, provide	Counsel, provide	Counsel, support, provide, refer	Counsel, provide, refer	Counsel, refer	Counsel, refer	Counsel, refer	Counsel, provide, refer	Counsel, refer	Refer
Pharmacy	Counsel, provide	Counsel, provide	Counsel, refer	Counsel, provide	Counsel, sell, refer, for injection	Counsel, sell, refer	Counsel, sell, refer	Counsel, provide, refer	Counsel, refer	Refer
Social marketing outlets	Promote, sell, refer	Promote, sell, refer	Promote, refer	Promote, sell,	Promote, sell, refer	Promote, sell, refer	Promote, sell, refer	Counsel, provide, sell, refer	Refer	Refer

1.5.7 Stock-outs of family planning products

Contraceptive stock-outs refer to the temporary unavailability of family planning commodities at a health facility or store where they are supposed to be available. Stock-outs have an impact on contraceptive prevalence and method choice, and reducing contraceptive stock-outs is a critical measure of the success of a family planning programme [73]. Kenya developed the Reproductive Health Commodity Security Strategy (2013-2017) to guide the planning, implementation, coordination, supervision, monitoring and evaluation of reproductive health commodities to ensure "uninterrupted, accessible and affordable supply of reproductive health commodities to all people that need them, whenever and wherever they need them." The development of this strategy was necessitated by the

growing numbers of the reproductive age population, hence the increased demand for contraceptives. This called for a well-coordinated and efficient logistics systems and contraceptive security at all levels to ensure smooth supply, as well as the control of costs by eliminating overstocks, spoilage, pilferage and other forms of waste.

In 2015, Kenya carried out the 'Kenya Health Facility Assessment (KHFS)' which sought to establish the type of contraceptives offered at the various levels (primary, secondary and tertiary). The modern FP methods included in the assessment were nine, namely; male condoms, female condoms, oral contraception, injectables, emergency contraception, IUDs, implants, sterilization for females (Bilateral tubal ligation), and sterilization for males (Vasectomy). The findings from the survey show that among the primary health facilities, 94% provide at least 3 modern contraceptive methods while 80% of the secondary and tertiary facilitates provide at least 5 modern contraceptive methods [77].

The overall findings from the survey conducted in 641 out of 10,062 show that supply chain delays, understaffing and lack of equipment for service delivery are some of the barriers to availability of family planning commodities at health facilities.

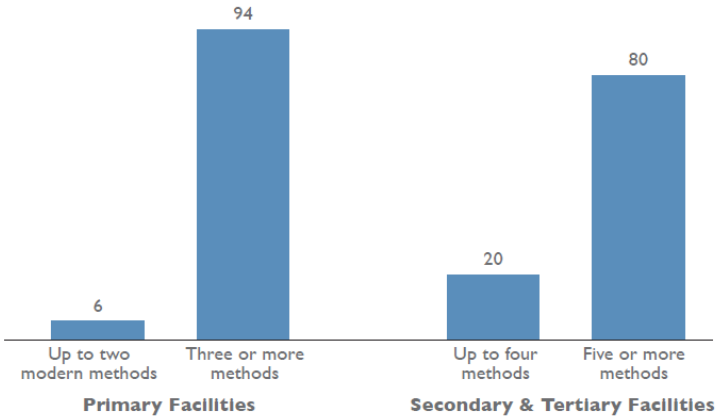

Figure 1: Distribution of service delivery points by the number of modern contraceptives offered

1.5.8 Provider Attitudes

Provider attitudes, opinions, and beliefs and misconceptions can influence the update of family planning by clients. Health care providers have an obligation to maintain a professional, respectful and a non-judgmental behaviour when dealing with clients. The interaction between the health provider and the client has an impact on the clients' ability to trust and share personal concerns, listen and retain valuable information, make informed decisions based on information provided, commit to adopt a new health related behaviour, willingness to continue using the facility and be an agent of change in the community. Health care providers behaviour in health facilities is governed by strict adherence to job aids to help improve provider-client interactions which ultimately leads to uptake of family planning services [79].

1.5.9 Cost considerations

The provision of FP services involves both financial and opportunity costs. The cost to the client includes the time taken off work to visit the service delivery point (SDP); transport costs; and the direct cost of services, which includes the cost of the contraceptive commodity and the professional services that are required to obtain it. The service provider must consider the client's financial circumstances and ensure that the client is aware in advance of any ongoing expenses (e.g., returning frequently for reinjections, especially when transportation costs are significant). If the cost of a method will impose a major hardship on the client, then the provider should discuss an alternative contraceptive or a means of obtaining the desired contraceptive less expensively.

Service providers should be prepared to discuss the cost-effectiveness of various available contraceptive methods with the client. For example, some methods might be highly priced at the onset (e.g., an IUD or contraceptive implant), but the unit cost is low over time because the duration of effectiveness is long. On the other hand, a less expensive method that has shorter duration of effectiveness and requires more frequent visits to the SDP (e.g., COCs, injectables, and condoms) will have a higher yearly unit cost. In addition to the direct costs at the SDP, there is also the cost to the national programme related to human resources, procurement of commodities and consumable supplies, logistics, and supervision and monitoring.

1.6 Contraceptive Use in Kenya

The success of family planning programmes over time is monitored using trends in current use of family planning. Trends in modern contraceptive use among married women in Kenya from the late 1960s indicate that oral contraception and intrauterine devices (IUDs) were the most popular modern contraceptives. A steady increase of modern contraceptive uptake was recorded in the early 1970's with the adoption of the national family planning programme.

National surveys conducted thereafter recorded an increase in use of any modern family planning from 18% to 27% between 1989 and 1993. Thereafter, there was an increase to 32% in 1998 but a non-increase between 1998 and 2003 (modern contraceptive use remained at 32% in both 1998 and 2003). The period between 2003 and 2014 recorded a continued increase in modern contraceptive uptake. Modern contraceptive use among currently married women increased from 32% in 2003 to 39% in 2008-09 and again to 53% in 2014. There has also been an impressive drop in use of traditional methods from 9% to 5% between 1989 and 2014. There was also an increase in use of injectables from 3% to 26% between 1989 and 2014, and for implants from 0.8% to 10% between 1998 and 2014 [62, 66, 80-82]. These results are further highlighted in the table below.

Table 6: Trends in current contraceptive use among currently married women, 1989-2014

Method	1989	1993	1998	2003	2008-09	2014
Any method	**26.9**	**32.7**	**39.0**	**39.3**	**45.5**	**58.0**
Any modern method	**17.9**	**27.3**	**31.5**	**31.5**	**39.4**	**53.2**
Female sterilization	4.7	5.5	6.2	4.3	4.8	3.2
Male sterilization					0.0	0.0
Pill	5.2	9.5	8.5	7.5	7.2	8.0
IUD	3.7	4.2	2.7	2.4	1.6	3.4
Injectables	3.3	7.2	11.8	14.3	21.6	26.4
Implants			0.8	1.7	1.9	9.9
Male condom	0.5	0.8	1.3	1.2	1.8	2.2
Other modern method	0.4	0.1	0.0	1.5	0.5	0.1
Any traditional method	**9.0**	**5.5**	**7.5**	**7.0**	**5.3**	**4.8**
Rhythm	7.5	4.2	6.1	6.3	4.7	3.8
Withdrawal	0.5	0.4	0.6	0.6	0.7	0.7
Other	1.3	0.6	0.8	1.9	0.7	0.3
Not currently using	**73.1**	**67.3**	**61.0**	**60.7**	**54.5**	**42.0**
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Number of women	**4,765**	**4,629**	**4,834**	**4,919**	**4,928**	**18,549**

1.7 Anthropological Background of Birth Control in Kenya

In the traditional African setting which is like Kenya, a wife's worth was determined by her fertility. Failure to bear children would lead to scorn, divorce and ridicule by men and fellow women. In polygamous marriages, especially among the Luo in Kenya, each wife competed to bear as many children as possible to his husband. Children represented wealth and some form of manpower. Children were also a symbol of social security, so the more one had, the greater the chance that some would survive to support their parents in old age. It was until the early

1970s that the government struggled to control population growth by introducing family planning. There have been improvements in the uptake of family planning, despite this, wide disparities especially in rural areas [83].

1.8 Contraceptive Use among Vulnerable Groups of the Population in Kenya

The term 'vulnerable groups' is used to define segments of the population that face wide disparities in the rates of unintended pregnancy, abortion, unplanned births among other things which contribute to a vicious cycle of social and economic disadvantages due to their inability to control their fertility. This thesis focuses on five groups who are considered vulnerable due to their social and economic disposition in Kenya. The groups include young urban women, women who have experienced unintended pregnancy, women living in low income settlements, female sex workers and migrant women. The prevalence and barriers to contraceptive use among these population groups are studied and recommendations formulated to improve these groups contraceptive use. Additionally, the thesis studies men who are sexually active to understand the role they play in contraceptive decision making for women. The aim of this thesis would have been to look at more vulnerable groups in the society, but due to limitations in time and funding just a few groups mentioned above are studied.

The study population are classified as vulnerable either by the type of environment, slum residence, where they live in which may act as a

barrier to access of services including contraception. We also look at our study population by change of their living environment through migration, challenges they face as young people living in urban areas and experiences which either increase their perception of risk or by the kind of work they engage in as female sex workers thereby pre-disposing them to more risks. Unmet need for contraception among these vulnerable groups remains high. The challenges posed by contraceptive use calls for the need to study these groups of the population to understand their contraceptive prevalence, barrier and formulate recommendations to address their contraceptive needs. This way, specific programmes and policies can be implemented to better meet these needs and consequently increase access to contraceptive information and services which would ultimately increase contraceptive uptake. We therefore study contraceptive prevalence, barriers and then make recommendations to improve uptake among vulnerable groups such as women living in slum settlements, young urban women, migrant women, female sex workers, women who have experienced unintended pregnancy and sexually active men in Kenya.

1.8.1 Young Urban Women

Sexual behaviour among young people is characterized by erratic, infrequent and unplanned sexual activities, a trend that exposes them to unwanted pregnancy and sexually transmitted infections including HIV [84]. Age at first sex among young women is decreasing. In Kenya for instance, the median age at first sexual debut declined from slightly from 18.2 years to 18 years among women aged 20-49 years and 17.6 years to 17.4 years among men aged 20-54 years between 2008-09

and 2014 respectively [62, 66]. On the contrary, while sexual activity among young women begins relatively early, contraceptive knowledge and use remains low. According to the Kenya Demographic and Health Survey, 2008-09, current contraceptive use (modern methods) among all women aged 15-19 and 20-24 is 5% and 24% respectively. The most recent KDHS (2014) records a slight increase in use of contraceptives among all women aged 15-19 and 20-24 as 9.3% and 38.5% respectively. Existing family planning messages which highlight the need to limit family size or space births are mainly targeted at married women, excluding young women who have similar or greater FP needs. To augment current available data and have a better understanding of the barriers to contraceptive use among young women in urban areas, this study seeks to understand method specific myths and misconceptions about modern family planning methods and recommend appropriate approaches to inform behaviour change communication targeting young women. Additionally, the Committee on the Rights of the Child recommends that, 'State parties should provide adolescents with access to sexual and reproductive information, including on family planning and contraceptives, the dangers of early pregnancy, the prevention of HIV/AIDS and the prevention and treatment of sexually transmitted diseases (STDs)'. Lack of evidence-based sexuality education and information inhibits the ability of young women to make informed decision on contraceptive use which subsequently leads to unintended pregnancy and abortion among these young women. Our study findings seek to make a contribution by filling in the information gap on the barriers to contraceptive use and myths and misconceptions of contraceptive use

that must be addressed to increase contraceptive uptake, especially among vulnerable populations.

1.8.2 Women who have experienced Unintended pregnancy

In spite of major gains in contraceptive prevalence over the last few decades, many women in most parts of the developing world who would like to delay or avoid pregnancy, do not use any method of contraception. Unmet need for contraception is the major cause of unintended pregnancy. Unintended pregnancy has serious health consequences for women and their families such as unsafe abortion which may sometimes result in the disability and death of women [85]. Globally, 89 million unintended pregnancies occur each year with the majority being in low income countries [86, 87]. Estimates from the WHO indicate that there were 56 million unsafe abortions in 2010/4 period which translates to about 35 abortions per 1,000 women aged 15-44 [38].

According to the International Conference on Population and Development (ICPD) declaration, and SDGs, access to contraceptives is a right to help women decide if, and when to have children. All individuals and couples should have access to and an opportunity to choose from a wide range of contraceptive options to help then decide if, and when to have a pregnancy. Despite this, nearly half of all unintended pregnancies were due to inconsistent and incorrect contraceptive use.

It is also reported that unintended pregnancy is higher among certain segments of the population such as young women, those in the lower wealth quintile, women with lower levels of education among other

characteristics. The long acting reversible methods have lower failure rates and require the least routine compliance. Despite this, their overall use in low-income countries including Kenya remain low. One reason attributed to this has been lack of personnel to provide these services, myths and misconceptions around long acting methods among women and health care providers and upfront costs of initial use, all these discourage their use. While several studies have explored the association between contraceptive use and unintended pregnancy, much less is known about the possible effects of the latter on the former, hence the need for this study.

1.8.3 Women living in Slum Settlements

Majority of studies rely on data from national surveys that do not take into consideration the inter and intra disparities within regions. Slum settlements, usually characterized by low levels of education, poverty, poor sanitary conditions, large households and poor access to health services including modern family planning services may be left out in these surveys [64]. Successive Kenya Demographic and Health Surveys have showed higher contraceptive prevalence for urban areas than rural areas. Despite this, little is known about contraceptive use patterns among women living in urban slum settlements. Rapid urbanization and the continued growth of informal settlements calls for an understanding of access to reproductive health services including contraceptives [88]. Elsewhere it has been reported that women of lower socio-economic status were less likely to use modern contraceptives compared to their higher income counterparts, additionally, unmet need for contraception was higher among this group of women [64]. These disadvantages confirm significant barriers

in accessing health care services and translate to lower health status. This discrimination also results to limited access to reproductive health services including modern contraceptives and could translate to a coercive family planning programme where women are forced to take up the limited contraceptive options available thereby violating fundamental human rights recognized by the Programme of Action of the ICPD [14]. It is therefore important to explore the characteristics and key determinants of contraceptive method choice among women living in urban slum settlements and compare their experiences with those living in non-slum (middle class urban settlements) areas.

1.8.4 Migrant and Non-Migrant Women

Migration plays a key role in creating opportunities for different segments of the population who either move from rural to urban areas and across borders to high income countries and vice versa [89]. The social networks created through migration lead to the spread of modern contraceptive use and knowledge through changes in the supply and demand for contraceptives [90]. Migrants to urban areas usually have increased access to contraceptives and information. While this may not immediately influence their behaviour, residence in new locations potentially eventually leads to an increase in the adoption of contraceptive use. These in turn have an effect on the overall fertility of a country. Migrants like the non-migrant segments of the population have a right to information and reproductive health services including modern contraception henceforward the need to study this sub group of the population.

1.8.5 Female Sex Workers

Public health interventions targeting female sex workers (FSW) are usually designed to prevent sexually transmitted infections (STIs) including HIV through consistent condom use. These programs pay little attention to the broader sexual and reproductive health and rights of these women and often focus on HIV and other STIs prevention, care and treatment while neglecting the reproductive health needs, including access to a wide range of family planning methods [91, 92]. Existing SRH intervention programmes have not fully embraced FSWs specific needs like they have done to the rest of the women in the general population [93, 94].

FSWs are also prone to maternal morbidity and mortality risks since they have risk factors associated with HIV-related mortality and complications, and unsafe abortions related deaths [95]. Women who are engaged in commercial sex are at a high risk of physical and sexual violence, and STIs, as well as unwanted pregnancy [93]. Despite these challenges and risks, studies have documented the motivations to use different family planning methods as influenced by several factors including partner type. Consistent condom use for FSW with clients may be troublesome either by choice, due to the nature of relationship (regular and emotional clients), or through coercion by other clients who refuse to use condoms by promising to pay more or using violence [91, 96]. Additionally, the health and human rights of FSW are considerably undermined by the criminalization of sex work thereby making them prone to police harassment, denial of access to health care services and other forms of human rights abuses. These challenges further deny the FSW their rights to access information and

a wide range of contraceptive options that serve their needs and those of their clients.

1.8.6 Sexually Active Men

Men are important given their role in sex and reproduction. However, population scientists have focused their attention on fertility of women almost exclusively while paying little attention to on men especially their role and participation on fertility and population growth. [97]. Several studies have highlighted the influence of men on reproductive decisions such as number of children and contraceptive use by the woman, but despite this, men's influence may not necessarily reflect the reproductive decisions of their wives [22, 98]. Men are rarely involved when providing information on sexuality, reproductive health or birth spacing. Many family planning programmes also exclude the participation of men. Since men are the heads of households, they make decisions around the well-being of their households including decisions on family planning [99]. In recent years, efforts are underway to broaden men's involvement with reproductive health and family planning. More specifically, measures are underway to improve gender relations and men's understanding of their familial roles and social roles in family planning and sexual and reproductive health issues [100].

Historically, most family planning methods involved the cooperation by men to regulate fertility. These methods included; male condoms, withdrawal and periodic abstinence. This has changed and women presently take more responsibility through modern methods of contraception such as the pill, IUD, implants among others [101].

Despite these changes, men play an important role in the reproduction process and their involvement remains important. The ICPD 1994 acknowledged that men had been bypassed by family planning programmes and needed to be reintegrated into sharing equally with women, the responsibility of deciding when and how many children to have through provision of a wide range of contraceptive methods and information [54].

1.9 Knowledge Gaps

The need to conduct an extensive study to understand contraceptive use and needs of vulnerable populations is necessitated by the need to understand all components of the population, their participation in the contraceptive debate and consequently to design appropriate programmes and policies to address their specific needs.

Young women are at a higher risk of maternal morbidity and mortality from pregnancy related complications and have also been associated with poor child health outcomes [102]. Young women who are sexually active are often in relationships where they lack negotiation power either due to older or wealthier partners. This decreases their probability of having protected sex which increases their risk of unintended pregnancy, unsafe abortion and sexually transmitted infections including HIV [24, 103]. The use family planning is effective in preventing unintended pregnancies, however, majority of young people do not use them and therefore end with unintended pregnancies most of which end in unsafe abortions. We therefore investigate the myths and misconceptions that may act as barriers to contraceptive use among young women living in urban areas.

The most outstanding gap in literature is lack of studies that address the inter and intra regional disparities in understanding contraceptive uptake, more specifically, studies that examine the challenges women living in deprived urban settings face. The assumption that urban residents enjoy many privileges including access to a wide range of contraceptive methods may not always apply to all urban residents. A

new body of evidence now points to the fact that informal settlements, within urban areas, may not enjoy these privileges. This means women living in these settings are disadvantaged in terms of access to sexual and reproductive health services including access to family planning services. The disadvantages women from slum environments face are further worsened when they experience unintended pregnancy. However, studies have documented the characteristics of women who experience unintended pregnancy but there exists a gap in literature in trying to understand how such an experience is likely to influence future use of contraceptives to avoid a similar experience especially for women living in disadvantaged environments.

Little is known about the motivations to use different family planning methods among FSW in Kenya. We therefore study the motivations to use different family planning methods among female sex workers in Mombasa and Naivasha, Kenya and further document their experiences and challenges.

Another gap that we intend to fill is to provide the information on factors that increase or decrease access to modern contraceptive use among women who migrate. Increased urbanization has led to an increase in the number of women who move from one place to another in search of better opportunities. Movement of women may lead to separation with sexual partners, and some may end in informal settlements which limit their access to family planning services thereby acting as a barrier to use. We therefore study seek to understand the influence of migration on use of modern contraceptives.

Several studies have documented the influence men have on the use of family planning on their sexual partners. Additionally, in patriarchal system such as in Africa, men often have the authority to make decisions that may limit access to health care including family planning to their partners. Due to these influences, it is necessary to study the characteristics of men who promote the use of family planning.

The following chapters will describe the objectives and methods employed in addressing the gaps.

1.10 Framework for Social Analysis of Contraceptive Use

The conceptual framework we use in this dissertation is based on the framework for the social analysis of reproductive health by Price and Hawkins. This framework states that the behaviour of human beings is defined by social relations within political and cultural contexts [104]. They challenge the individualistic conceptual framework for the study of reproductive behaviour because reproductive decisions are influenced by individual factors and relations from social networks [105, 106]. The framework for social analysis presents a systematic assessment of social problems related to quality of life, services, and social justice in a community with the aim of finding solutions to the situation. The social analysis process takes a multi-dimensional approach by considering the various levels which include the individual, interpersonal, community and super-structural [107]. Historical factors that influence present developments such as urbanization, culture, migration among other issues are also important

in social analysis. Social analysis also looks at the community's population in terms of age, gender, ethnicity, power dynamics, religious and cultural beliefs, among other factors.

In their framework, Price and Hawkins acknowledge the influence of poverty where families continue to have large number of children because they see children as a source of wealth thereby having a negative influence on the use of contraceptives. Also, they recognize the influence of culture and societal norms of interaction as an influence to use contraceptives or not. Gender also has an influence on reproductive behaviour particularly the influence of men, and where gender relations are in agreement with fertility regulation, contraceptive use is high and the reverse holds [104].

This thesis uses the social analysis framework which emphasizes the need to analyze issues not only from the individual perspective but to incorporate community perspectives including the needs of the most vulnerable populations. The framework offers concepts that have guided the studies presented in this thesis to help understand the determinants and barriers to contraceptive use among vulnerable populations in Kenya and thereafter inform recommendations to policy makers and programme implementers to improve contraceptive use among vulnerable populations.

The levels of social analysis considered in this dissertation are informed by Nobelius [107] who defines the levels as follows:

The individual level

At the individual level, we study attributes that an individual possess that have an influence on their decision to use contraceptives [107]. Individual behaviour is influenced by knowledge which leads to acceptability of the behaviour, deciding, and finally adopting the behaviour. Individual level attributes include factors such as education, age, marital status, residence (rural or urban), religion, region, exposure to media for family planning messages, discussion of family planning with a health care provider, and number of live births among others [108]. Knowledge is a determinant of contraceptive use, however, trends in the KDHS surveys have confirmed an increase in knowledge, however, this increase has not necessarily translated to high contraceptive use [62, 66, 80-82, 109]. Contraceptive acceptance and use is influenced by other factors beyond knowledge.

Interpersonal level

Several studies have explored the influence of individual level factors on contraceptive use, however, few have explored the role of interpersonal level factors on contraceptive use. Individuals live in societies and their interaction with other members of the society influences their behaviour through what the society describes as 'acceptable' behaviour [110]. The interpersonal level consists of several other supra-levels such as the social, cultural, communities and economic. The social level entails the influence from social network which may offer both positive and negative influence on contraceptive use. The role of friends and family in influencing contraceptive use has been documented with most influence being informed by myths and

misconceptions about contraceptive use. In their study in Nyanza, Rutenberg and Watkins found that women preferred to talk to other women waiting outside the family planning clinic than the nurses [111]. Reliance on social network leads to propagation of myths and misconceptions which have a negative influence on contraceptive use. These myths and misconceptions could either be informed by perceived side effects of cultural beliefs that do not support contraceptive use. Further, demand for children is influenced by community norms that place value on children to provide labour, act as security in regions of high child mortality. Religion also has a strong influence on the use of contraceptives, for instance, the influence of Islam in North Eastern part of Kenya has led to a high TFR due to low contraceptive use [62, 66, 80-82, 109].

Structural level

The structural level consists of institutions involved in service delivery such as health facilities and their support to women seeking services at the health facility [107]. Additionally, the legislative role is involved at this level where policies are formulated at the national level to help improve access to services. In Kenya, the government is committed to reducing maternal deaths as evidenced by the policy for free maternal delivery services. The government has committed to increasing access to health services and the health care system is organized in several levels to promote access to health services. Despite gaps presented, there is commitment by the government and the recommendations provided will also help the government address the gaps for better access to health services, especially the reproductive health services.

Super-structural level

This level involves working with the international community to formulate guidelines and polices to help improve access to health services [107]. We refer to SDGs which have global targets to help monitor progress in reducing maternal deaths by increasing access to reproductive health services including contraceptives. The government of Kenya is working towards meeting the SDGs and specifically on health, by increasing access to maternal health services through the free maternal health policy that has removed all user fee for maternal health services in public health facilities.

CHAPTER TWO

Objectives

This chapter presents the objectives of this thesis which seek to provide an understanding of the determinants, predictors and barriers to contraceptive use among vulnerable populations in Kenya. The studies presented in this thesis are based on cross sectional quantitative and qualitative studies conducted in Kenya.

2.1 Overall Objective

The overall objective of this work is to contribute to meeting the unmet need for family planning and contraceptive use by studying the contraceptive prevalence rate, through an understanding of the predictors and barriers to contraceptive use among vulnerable populations in Kenya.

2.2 Specific Objectives

2.2.1 To get insights into the prevalence and predictors of contraceptive use among vulnerable populations

Women living in informal settlements, FSW, young women, and migrants face challenges in accessing services including reproductive health care. This places them at a greater risk for unmet need for contraception which presents challenges such as unintended pregnancy. We therefore study the prevalence of unintended pregnancy among women living in informal settlement and further consider how that experience can trigger risk perception to improve contraceptive use thereby avoiding the re-occurrence on unintended pregnancy. Further, these women living in informal settlements face challenges in their choice of contraceptives because of individual, interpersonal, structural and super-structural level factors as informed by the social analysis conceptual framework. The influence of urbanization on contraceptive use also remains key in understanding the challenges that women who migrate or those who live permanently in rural environments face regarding access reproductive health services, and specifically contraceptives.

2.2.2 To study barriers to contraceptive use among vulnerable populations

Contraceptive use is influenced by perceived and actual barriers which are either propagated by the individual, partners, friends, men and those around the individual such as friends and members of the social network. Such barriers act as a hindrance to contraceptive use among vulnerable populations and are further compounded by the existence of other service related barriers.

2.2.3 To formulate recommendations to improve contraceptive use among vulnerable populations

We aim at formulating recommendations around contraceptive use among vulnerable populations based on the research projects presented to influence policies, and practices to increase contraceptive use.

CHAPTER THREE

Methods

This chapter presents information on how the studies address the research questions by exploring information on the study setting, study participants, instruments used for data collection, sample size justification, data management and analysis plan. research design and during data collection, data management and analysis techniques employed.

3.1 Study Setting

Kenya

Kenya lies on the equator in the Eastern Coast of Africa and is bordered to the North by Sudan and Ethiopia, to the East by Somalia, to the West by Uganda, to the South by Tanzania, and to the Southeast by the Indian Ocean. It straddles the Equator in eastern Africa, lying across latitudes 5^0North to 5^0South and longitudes 34^0 East to 42^0 East. The Republic of Kenya covers a total area of 582,646 km2 with a 536 km stretch along the Indian Ocean on the southeast. Much of the country, especially in the North and East, is arid or semi-arid. The coastline houses the port of Mombasa [112].

Formerly, the country had eight administrative units and with the promulgation of the new constitution in 2010, these have since been turned to 47 counties (see Figure 2 below). The Kenyan economy is largely agricultural. The agricultural sector (agriculture, forestry and fishing) continues to play a dominant role and accounts for about 22% of the total GDP. Manufacturing is the second largest sector and represents around 11% of the GDP. Other major sectors include: real estate (about 8% GDP), wholesale and retail trade (7% GDP), transport and storage (around 7%) , education (about 7%), financial and insurance activity (around 6%) and construction (around 5%) [113]. The Population as per the 2009 census was 38.6 million with the trend data showing that the population more than tripled between 1969 and 2000. At a growth rate of 2.9% per annum, the population is likely to increase to 77 million by 2030 [66]. Some basic demographic indicators are shown in the table below.

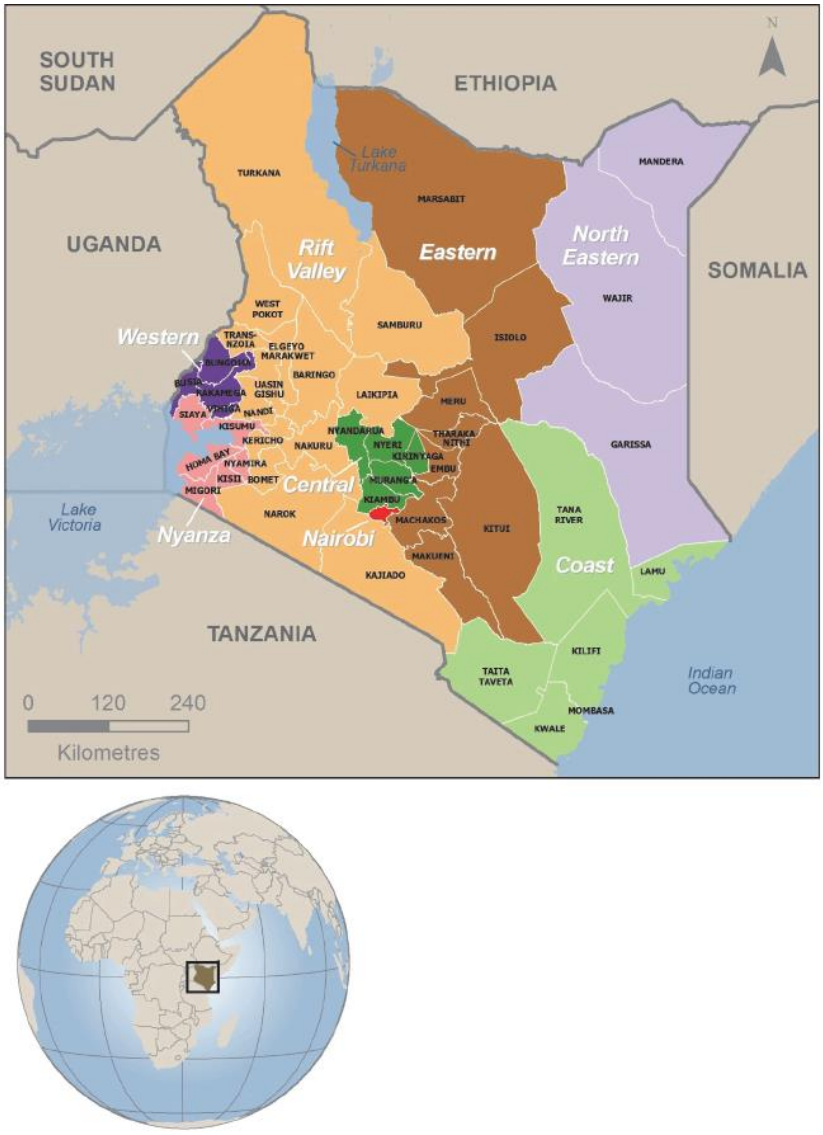

Figure 2: Map of Kenya showing the 47 counties

Source: [66]

Table 7: Selected Demographic Indicators for Kenya

Selected demographic indicators for Kenya, 1969, 1979, 1989, 1999, 2009, and 2014

Indicator	1969	1979	1989	1999	2009	2014
Population (millions)	10.9	16.2	23.2	28.7	38.6	43.0[a]
Density (pop/km^2)	19.0	27.0	37.0	49.0	66.4	73.9[a]
Percent urban	9.9	15.1	18.1	19.4	32.3	32.3[c]
Crude birth rate	50.0	54.0	48.0	41.3	34.8	30.5[c]
Crude death rate	17.0	14.0	11.0	11.7	10.4	10.4[b]
Inter-censal growth rate	3.3	3.8	3.4	2.9	2.9	2.9[b]
Total fertility rate	7.6	7.8	6.7	5.0	4.8	3.9[c]
Infant mortality rate (per 1,000 births)	119	88	66	77.3	54.0	39.0[c]
Life expectancy at birth	50	54	60	56.6	58.0	58.0[b]

[a] Projected figures
[b] Assumed to remain constant over the inter-censal period
[c] 2014 KDHS results

Source: [66, 114-119]

Kenya's population according to the 2009 Population and Housing Census was 38,610,097 people while recent estimates for the 2014 population is 43 million people [66, 118, 120]. Earlier census results showed a population 28.7 million in 1999, which increased from 5.4 million in 1948 [121]. The first indications of a rising trend in population growth in the 1960s helped spur the adoption of a national population policy and program in 1972. Similarly, the later estimates of natural increase as high as 3.8% (1979) led to a renewed effort culminating in the creation of the National Council for Population and Development, and numerous other reproductive health initiatives in the 1980s [122].

Study Location

The studies presented were conducted in Nairobi County Korogocho where women living in two non-slum settings (Harambee and Jericho) and two slum settlements (Korogocho and Viwandani) were interviewed on their experiences on unintended pregnancy and use of contraceptives. The settlements were purposively selected by virtue

of being part of the Nairobi Urban Health and Demographic Surveillance System (NUHDSS), a research platform of the African Population and Health Research Center (APHRC) [123]. All the four settlements are also recognized as distinct communities with socially and economically heterogeneous residents. Korogocho and Viwandani are densely populated settlements occupied largely by economically disadvantaged people. Jericho and Harambee, on the other hand are also characterized by socio-economic diversity, but unlike the slums communities they are predominantly middle-class settings, and enjoy better health indicators [124-126]. They were established during the pre-colonial period as predominantly African settlements. They have relatively better residential structures including accessible feeder roads, drainage and sewerage system [127].

The other study area is Mombasa, Kenya's second largest city located in the southeast Coast Province and a tourist destination [128]. A number of key populations, with high HIV prevalence, reside in Mombasa including MSM with an HIV prevalence of 43% and female sex workers with a HIV prevalence of 35% [129, 130]. Kisumu also part of the study areas is a port city in Kisumu County, Kenya with a population of 409,928 (2009 census). It is the third largest city in Kenya, the principal city of western Kenya. Additionally, Thika, an industrial town in Kiambu County was targeted. Thika has a population of 139,853 which is growing rapidly, as is the entire greater Nairobi area [1]. Some key demographic indicators for Kenya are as presented in Table 8 below.

Table 8: Demographic Indicators for Kenya

Indicator	KDHS 2003	KDHS 2008-09	KDHS 2014
Maternal mortality rate (MMR)	414	488	362
Infant Mortality rate (IMR)	77	52	39
Neonatal mortality rate (NMR)	33	31	22
Child mortality	115	74	52
Antenatal care coverage	88	92	96
Births attended by skilled personnel	42	44	62
Contraceptive use: Any method	39	46	58
Contraceptive use: Any modern method	31	39	53
Unmet need	27	26	18
HIV prevalence	6.7	6.3	5.6*

*The HIV prevalence of 5.6 is reported from the Kenya AIDS Indicator Survey 2012. KDHS 2014 did not collect data on HIV prevalence

Source: [62, 66, 109, 131]

3.2 Study Period

This section provides background information about the research settings and methods used to achieve the six studies reported in this thesis. The research work draws data from the Kenya Demographic and Health Survey (KDHS), a nationally representative survey targeting both men and women and other studies conducted in Mombasa, Kisumu, Thika, and an informal and middle-class settlements of Nairobi. Data collection for the studies that informed this work was conducted between 2008-09 and 2014. The study population includes young urban women, women living in slum and non-slum environments studied by their experiences of unintended pregnancy or motivations to use different contraceptive methods, female sex

workers, migrant and non-migrant women from KDHS, and men, either reporting using a male or partner initiated modern contraceptive method.

The study presented in Article 1 was conducted young women aged 15-24 from urban and peri-urban areas and from low socio-economic classes, given the high unmet need in this segment of the population [132]. Data collection was conducted in April 2012 to provide that that would inform the development of communication materials targeting young women. The second study (Article 2 and 3) is a cross-sectional quantitative and qualitative survey conducted in 2009/10 in two non-slum settings (Harambee and Jericho) and two slum settlements (Korogocho and Viwandani) and nested in the Nairobi Urban Health and Demographic Surveillance System (NUHDSS), a research platform of the African Population and Health Research Center (APHRC) [123]. Article 4 draws data from a study conducted from June to December 2008, within two districts - Naivasha, Nakuru County and Changamwe, Mombasa County. The two locations are known for having a concentrated FSW population, in part due to the coastal line in Mombasa, a major tourist attraction and Naivasha due to truck drivers, transport and seasonal workers in flower farms in Naivasha [91]. Article 5 and 6 draw data from the KDHS collected in 2008-09 among women of reproductive age and 2014 among men aged 15-54 years respectively.

3.3 Research Methods for the Studies

This thesis presents studies that employed both quantitative and qualitative methods to collect data among young women, women living in informal settlements, FSW, migrant and non-migrant women, and men. Quantitative methods provide data on the prevalence and predictors of contraceptive use to help us understand the level of contraceptive use among vulnerable populations. On the other hand, qualitative methods are used to provide insights into the barriers and enables of contraceptive use and to help understand the trends observed from the quantitative data.

Quantitative methods employed semi-structured questionnaires administered among a representative sample of the study population by trained research assistants. The questionnaires sought information on respondents' social, economic, demographic factors, pregnancy and birth histories (including miscarriages and abortions, stillbirths, and neonatal deaths), the intendedness of all pregnancies mentioned by the respondent irrespective of their outcomes, current use of contraception and specific methods used among other issues. Data collection tools were pretested on the last day of training and questionnaires administered in Swahili language. The trainings covered study objectives, interviewing skills, review of the data collection tools, survey procedures, sampling approach and ethical issues governing research with human subjects. The study teams worked with quality control teams that monitored all aspects of quality to ensure data collection followed the study procedures and adhered to the agreed protocol while ensuring the rights of the participants were respected throughout the duration of the various studies.

Qualitative approach utilizing in-depth interviews and focus group discussions with members of the target population were employed. Qualitative approach provides culturally specific information on issues pertaining to the influence of values, opinions, behaviours and social contexts of the local population [133]. In-depth interviews are used to generate in-depth information and insights. Additionally, in-depth interviews are preferred when the issue under investigation is sensitive especially when having discussions on topics around sexual activity, one-on-one interview sessions with the participants offer a better opportunity for the participants to freely share their personal experiences and offer the interviewer an opportunity to probe issues under discussion. Focus Group Discussions, where in-depth discussions are conducted guided by a trained moderator were used to gather information on issues that were not too sensitive. Focus Group Discussion participants can be clients, prospective clients, influencers of your clients or the general population. Focus groups are used to answer a specific question, or to explore a particular problem. They can also be used as a beginning step, to gather information about a population with whom a researcher may have little experience. A focus group discussion can have between 8-12 participants depending on the topic of enquiry and the ability of the moderator to control the participants. The questions were open ended and allowed for probing depending on the line of enquiry. The interviews were conducted in Swahili by highly-experienced qualitative interviewers. The training was conducted by expert qualitative researchers and introduced the interviewers to the aims of the study, familiarized them with the study

guide, and exposed them to guided dialogue techniques and critical tips for qualitative interviewing.

3.4 Data Management and Analysis

Data management and analysis was informed by the type of data collected and specific objectives to be addressed. Chapter 4 provides detailed accounts of the data management and analysis procedures for each article. In summary, the procedures employed are as follows:

Quantitative studies

Semi-structured questionnaires were used to collect data which was entered in CS Pro and later exported to STATA software where the data was managed before conducting analysis. Chi-square tests were used to examine differences across the independent variables. Descriptive statistics were generated using bivariate analysis to assess individual relationship of each explanatory variable with the outcome variable. Secondly, multivariate analysis was conducted to assess the net effect of the outcome variables on selected independent variables. Explanatory variables were considered significant at a p-value of 0.05 or less. The results of the regression analyses have been presented by odds ratio (OR) with 95% confidence interval. All analyses were weighted using the svy command to account for differences in sampling probabilities.

Qualitative studies

Interview guides addressing the study objectives were developed for in-depth interviews with the study population. The interviews were recorded and later downloaded into a computer, transcribed and later

translated from Swahili to English. The transcribed in-depth interviews (IDIs) were analyzed using an inductive approach involving thematic assessment of the narratives. Where applicable, quotations from the study participants are used to epitomize emerging issues and themes. To protect the identity of respondents, pseudonyms are use throughout the studies.

FGDs were digitally recorded, uploaded to a laptop computer, transcribed verbatim, and translated from Swahili to English by the moderator and note taker. Transcriptions and translations were reviewed for quality by the interview team. The analysis team performed qualitative analyses with NVivo v. 7.0 (QSR International Pty Ltd) qualitative data analysis software. A content-driven theme approach was used for analytic review of the FGD data. Transcripts were read and re-read to identify recurrent themes and to develop a coding tree. Once all the transcripts were coded, memos and display matrices were developed to examine each code in detail for sub-themes, nuances, and patterns across the interviews [91, 134].

3.5 Research Ethics

The study protocols for Article 1, 2, 3 and 4 were submitted for ethical approval at the KEMRI/National Ethics Review Committee, the Kenyatta National Hospital and University of Nairobi Ethics and Research Committee (KNH/UoN-ERC) and the institutional ethics boards of Population Services International Research Ethics Board (PSI REB) and Family Health International's Protection of Human Subjects Committee (USA). Article 5 and 6 involved the analysis of nationally

representative data that is publicly available and ethical approval was not required before use of the data. Written informed consent was obtained for all the quantitative studies, for the qualitative studies, additional permission was obtained to allow audio recording of the interviews. All interviews were conducted either at the respondent's household or at central locations that offered privacy to the respondent. All respondents were assured of confidentiality of the information they provided before participation. Entry into the various study locations was obtained by having additional consultative meetings with the local administrative leaders and gate-keepers to share the study procedures, purpose, objectives and also gain their insights on how best to engage the target population. The study team received additional training on observing ethical issues governing research with human subjects and this was observed during the entire period of the implementation of the studies.

3.6 Data Dissemination

The following manuscripts have been published and provide the basis for this thesis:

Ochako R, Mbondo M, Aloo S, Kaimenyi S, Temmerman M, Kays M. Barriers to modern contraceptive uptake among young women in Kenya: a qualitative study. *BMC Public Health 2015, 15:118* - **Impact Factor 2015 = 2.209**

Fotso JC, Saliku T, **Ochako R**. Unintended pregnancy and future contraceptive use among slum and non-slum women in Nairobi, Kenya. *BMC Pregnancy and Child Birth 2014, 14:224* **Impact Factor 2015 = 2.180**

Ochako R, Izugbara C, Temmerman M. Contraceptive method choice among slum and non-slum women in Nairobi, Kenya. *BMC Women's Health, 2016* **Impact Factor 2015 = 1.353**

Ochako R, Oucho J, Okal J, Askew I, Temmerman M. Modern contraceptive use among migrant and non-migrant women in Kenya. *Reproductive Health, 2016* **Impact Factor 2015 = 2.035**

Ochako R, Gichuhi Wanjiru. Pregnancy wantedness, frequency and timing of antenatal care visit among women of childbearing age in Kenya. *Reproductive Health 2016, 13:51. DOI: 10.1186/s12978-016-0168-2* **Impact Factor 2015 = 2.209**

Ikamari L, Izugbara, C.O, & **Ochako R**. Prevalence and determinants of unintended pregnancy among women in Nairobi, Kenya. BMC Pregnancy and Childbirth 2013, 13: 16 **Impact Factor 2015 = 2.180**

Ochako R, Temmerman M, Mbondo M, Askew I. Determinants of modern contraceptive use among sexually active men in Kenya. Reproductive Health, 201714:56 DOI: 10.1186/s12978-017-0316-3 **Impact Factor 2015 = 2.209**

Submitted

Ochako R, Okal J, Kimetu S, Askew I, Temmerman M. Experiences of Female Sex Workers Using Contraceptive Methods: a qualitative study in Kenya. BMC Women's Health

CHAPTER FOUR Results

This chapter presents research results that have been published in peer reviewed journals, and have also been presented in conferences, meetings with national, regional and international communities and among target groups during local level dissemination meetings. The research focusing on barriers to contraceptive use among young urban women was disseminated at national level technical working group meeting where the findings were used to inform communication that seeks to share information and dispel myths and misconceptions around contraceptive use by young women. Additionally, this research was shared at an international conference, the Population Association of America, a meeting that brings population scientists, programme implementers and policy makers from across the globe. The other articles published in peer reviewed journals have been widely cited and excepts featured in the local newspapers in Kenya and web pages to continue the debate of influencing relevant policies and inform programmes that promote contraceptive use among the population in Kenya and other countries that share similar characteristics to the Kenyan one.

Article 1

4.1 Barriers to modern contraceptive methods uptake among young women in Kenya: a qualitative study

Rhoune Ochako, Mwende Mbondo, Stephen Aloo, Susan Kaimenyi, Rachel Thompson, Marleen Temmerman and Megan Kays

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Published in BMC Public Health, Volume 15, Issue Number 118

This article presents findings from a study among young urban women in selected urban and peri-urban districts of the former administrative units of Nyanza, Coast and Central provinces of Kenya. It addresses Objective 2 that seeks to study barriers to contraceptive use among vulnerable populations. The findings of the study state that myths and misconceptions are main barriers to modern contraceptive use among young women and further stress the influence of social networks on contraceptive use. We recommend the use of mass media and peer campaign strategies to reach young people with accurate information to dispel myths and misconceptions that hinder use of family planning.

Ochako et al. BMC Public Health (2015) 15:118
DOI 10.1186/s12889-015-1483-1

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RESEARCH ARTICLE Open Access

Barriers to modern contraceptive methods uptake among young women in Kenya: a qualitative study

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Abstract

Background: Young women in Kenya experience a higher risk of mistimed and unwanted pregnancy compared to older women. However, contraceptive use among youth remains low. Known barriers to uptake include side effects, access to commodities and partner approval.

Methods: To inform a youth focussed behaviour change communication campaign, Population Services Kenya developed a qualitative study to better understand these barriers among young women. The study was carried out in Nyanza, Coast, and Central regions. Within these regions, urban or peri-urban districts were purposively selected based on having contraceptive prevalence rate close to the regional average and having a population with low socioeconomic profiles. In depth interviews were conducted with a sample of sexually active women aged 15–24, both users and non-users, that were drawn from randomly selected households.

Results: All the respondents in the study were familiar with modern methods of contraception and most could describe their general mechanisms of action. Condoms were not considered as contraception by many users. Contraception was also associated with promiscuity and straying. Fear of side effects and adverse reactions were a major barrier to use. The biggest fear was that a particular method would cause infertility. Many fears were based on myths and misconceptions. Young women learn about both true side effects and myths from their social networks.

Conclusion: Findings from this research confirm that awareness and knowledge of contraception do not necessarily translate to use. The main barriers to modern contraceptive uptake among young women are myths and misconceptions. The findings stress the influence of social network approval on the use of family planning, beyond the individual's beliefs. In such settings, family planning programming should engage with the wider community through mass and peer campaign strategies. As an outcome from this study, Population Services Kenya developed a mass media campaign to address key myths and misconceptions among youth.

Keywords: Family planning, Kenya, Young women, Contraceptives, Myths and misconceptions, Behaviour change communication

Background

Several decades after the introduction of modern family planning methods, Kenya's population is still growing and is projected to exceed 60 million by 2025 [1]. Although fertility declined between 1978 to 1997, it has levelled off in recent years [2]. This stall is attributed to a number of factors including reduced availability of modern contraceptive methods, diversion of resources to HIV/AIDS, and inadequate support for family planning programmes [2,3]. According to the Kenya Demographic Health Survey (DHS) 2008–09, total fertility rate (TFR) was 4.6, while 42% of married women reported their current pregnancies as unintended [4]. Contraceptive prevalence was found to be 46%; a result that did not meet the 2010 target of 62% set by the Kenya National Population Policy for Sustainable Development [1,3].

In the last decade, youth fertility has declined by 7% but the contribution to overall fertility (TFR) has increased from 32% in the late 1970s to 37% in 2008 [1].

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The proportion of teenagers who have started childbearing increases from 2% at age 15 to 36% by age 19 [4]. According to the Kenya DHS 2008–09, 12% of women aged 20–49 had sex before age 15, and about half had their first sex by their 18th birthday [4]. Research by the Centre for Study of Adolescence found that four in ten Kenyan girls had sex before the age of 19, many of them as early as 12 [5]. Recent statistics from the Ministry of Planning indicate that 97% of males and 85% of females aged 15–19 years are not married [1]. This suggests that age at first marriage cannot be used as a proxy for age at first sex [4] and many young people are having sex before marriage.

Young women in Kenya experience a higher risk of mistimed and unwanted pregnancy compared to older women. While the total mistimed (26%) and unwanted (17%) pregnancies among all women (15–49 years) remains high, young women (15–24 years) experience even higher mistimed (32% vs. 30%) and unwanted (15% vs. 10%) pregnancies compared to women in other age groups [4]. Every year, about 13,000 Kenyan girls drop out of school due to accidental pregnancy [5] and 103 out of every 1000 births in Kenya are delivered to girls aged 15–19 [1]. Accidental pregnancy is a leading cause of abortion [6]. However, contraceptive use remains low among youth; 73% of currently sexually active single women aged 15–19 report not using any contraception method [4].

Across all age groups, perceived and actual side effects of contraceptive methods emerged as a primary barrier to use. Kenya's DHS (married women only) found that non-users who did not intend to use contraception in the future most commonly cited fear of side effects and health concerns [4]. Side effects are also the most common reason for method discontinuation [4,7].

Even when awareness is high, poor knowledge of contraceptive methods and their side effects has been associated with poor uptake [8]. This finding may be related to the myths and misconceptions that many women hold about potential side effects and negative outcomes [9-11]. Myths are heard about from peers and partners, whose influence on contraceptive demand and uptake is well documented in Kenya [8,11-13].

Another key barrier is lack of physical and financial access to family planning commodities. Studies have shown that health facilities offering family planning are not equitably distributed throughout the country [3]. Women complain of frequent stock-outs and the associated costs of lost wages, transport and other financial challenges [8,11,14]. Studies have shown that, among youth, lower socioeconomic status has been associated with less condom use [15,16].

Shame is also a significant factor preventing use of family planning (specifically condoms), particularly for unmarried youth. Young people perceive women who carry condoms as promiscuous [17], and that asking a partner to use condoms would reveal them as sexually wayward or untrustworthy [6]. Young people also noted that while married people may freely ask for family planning, they are inhibited because of the shame associated with procuring contraceptives [6,18].

At service level, many providers and available health information indicate that family planning are only for those who are "mothers", and are not suitable for those who have not yet had a child [14]. At the policy level, a recent commentary in the Lancet advocates for the replacement of the term "family planning" with "contraception"; a more neutral term that applies to users, with or without families [19].

Despite the high proportion of unmarried sexually active youth in Kenya, the majority of research on barriers to family planning has been conducted among married women; research among youth is limited to condoms only [7,19,20]. Communications target married women and highlight the need to limit family size. Behaviour change communications do not respond to youth, whose needs are mainly to delay childbearing, and there is a gap in active and consistent national communication to create awareness and demand for family planning among 15–24 year olds.

In response, Population Services Kenya, in collaboration with the Division of Reproductive Health (now Reproductive and Maternal Health Services Unit), launched a communication campaign to demystify contraceptives among youth. To inform this new campaign, PS Kenya developed a qualitative study to better understand the drivers and barriers to contraceptive uptake among young women.

Methods

This study employed a qualitative approach using in-depth interviews with key members of the target population. In-depth interviews were selected given the sensitivity of discussing sexual activity among young people; one-on-one sessions offered participants the chance to speak more freely and offered the interviewer the opportunity to probe about barriers and drivers to contraceptive use.

Setting

PS Kenya's programmatic focus is on young women aged 15–24 in urban and peri-urban areas who come from lower socioeconomic classes, given the high unmet need in this segment of the population [4]. The Living Standards Measure (LSM) approach that assesses social economic status (SES) through ownership of various assets by the respondent was used. LSM, a widely used marketing research tool to segment population, is based on scores from ownership of various assets. We subdivided our population into 4 SES groups from the highest to lowest; AB, C1; C2 and DE. We screened and recruited respondents from social classes

C1, C2 and DE where PS Kenya programmes intervenes. Other parameters (female sex, age 15–24, and urban/peri-urban residence) formed the eligibility criteria for inclusion in the study, along with sexual activity in the last twelve months.

Respondents for the study were drawn from three regions of Kenya: Nyanza, Coast, and Central. These three regions were chosen based on contraceptive prevalence rates (CPR) in the regions as compared to the national average (39%); Central has a higher CPR (67%), Nyanza near average (37%) and Coast, the lowest CPR at 34% [4].

Sampling

Respondents were drawn from purposively selected districts within the three regions. Districts were selected based on having CPRs similar to the regional average, being primarily urban or peri-urban, and having a population with low socioeconomic profiles. Within each district, a list of locations and sub-locations was generated, and one sub-location in each district was randomly selected and further smaller administrative units, villages/estates, were randomly selected where respondents were screened and recruited if they met the eligibility criteria.

Field-based recruiters assisted with identifying the women within the villages/estates. A landmark within the villages/estates was randomly selected, and field recruiters visited households in a predetermined direction. Each fifth household was approached to see if they had an eligible respondent. No more than one respondent per household was recruited, and if there was more than one eligible woman the youngest was taken. This process was repeated until a pre-set quota of women was reached. The recruiters then set a date for the interviewer to return to conduct the interview. The refusal rate for this survey was negligible and comparable to that of larger household surveys conducted in Kenya such as the Kenya Demographic and Health Survey and the Kenya AIDS Indicator Survey that record response rates of over 96%.

Study population

As shown in Table 1 below, 34 young women interviewed for this study were from three sampled locations of Kisumu, Thika and Mombasa. These women were from the lowest socioeconomic class who are the target group for PS Kenya interventions. While the study intended to recruit a higher proportion of non-users than users, in fact more users (58.8%) were recruited because some women who used condoms did not consider them as a method of contraception. The majority of the women (61.8%) were aged 20–24, with the rest 16–19 years. Most women had secondary education (44.1%) and were unemployed (44.1%); 29.4% were currently students. The majority of the women had no child (52.9%) and were single (55.9%).

Table 1 Characteristics of the study population

Characteristics	Percent	N
Age		
16-19 years	38.2	13
20-24 years	61.8	21
Education		
Primary	35.3	12
Secondary	44.1	15
College	20.6	7
Marital status		
Single	55.9	19
Married	44.1	15
Contraceptive use		
User	58.8	20
Non user	41.2	14
Number of children		
None	52.9	18
1 child	32.4	11
2-4 children	14.7	5
Occupation		
Student	29.4	10
Unemployed	44.1	15
Casual job	8.8	3
Business	17.7	6
Study location		
Kisumu	38.2	13
Mombasa	38.2	13
Thika	23.6	8

Data collection

The data was collected by a team of experienced and trained qualitative interviewers in April 2012. The interviews took place in a location selected by the respondent, preferably in their homes. The interviews were based on a discussion guide that covered the main topic explored in this paper, beliefs to change, which are narratives from the participants through which they expressed costs and disadvantages of modern contraceptive use. Other topics explored during discussion with the participants were: archetype (demographic facts, values, aspirations, worries and fears); beliefs to reinforce (benefits of contraceptive use); strategies to behave (statements with intent to behave, an obstacle and how to overcome the obstacle); acquisition stories (how they buy or receive modern contraceptives); category experience (past and present experiences and other competing behaviours); knowledge and sophistication on various methods; openings (preferred media channels for communication); and brand associations (emotional attachments to specific contraceptive

brands). The interview guide was drafted in English and translated in Kiswahili. Interviews were conducted in English and Kiswahili by trained and highly experienced qualitative Research Assistants. Interviews were audio recorded.

Data analysis

Interviews were transcribed and translated into English where necessary. The data was coded using a set of pre-set codes based on the discussion guide as well as emergent themes. The thematic coding framework was then applied to assess all interview transcripts. The analysis looked for patterns and associations on the emerging themes, focusing on the drivers and barriers to modern family planning uptake. Quotations from the study participants have been used to characterize emerging issues and themes. Non-identifying information of the study participants has been used in this paper. RATS guideline for reporting qualitative studies were adhered at all points during the study.

Ethical considerations

Permission to conduct this research was obtained from the Kenya National Council of Science and Technology (now National Commission for Science, Technology and Innovation) while ethical approval was obtained from the Population Services International Research and Ethics Board. As per ethical regulations that govern research involving participants who are considered as minors, consent was sought from parents/guardians of all participants aged below 18 years, the age of consent in Kenya, before their participation in the study. Verbal consent was provided by the study participants, and no identifying information was connected with the interviews or retained following the completion of the analysis.

Results

Knowledge and experience of family planning

All the respondents in the study were familiar with modern methods of contraception. Among current and former users, most personal experiences were with the IUD (the coil), condoms, pills, injectables and implants. Most women were able to name several forms of contraception and to describe, in general, their mechanisms of action. However, knowledge of dual protection varied:

> Many prefer the condom since it prevents in two ways, she (person using) won't get pregnant, she also believes she won't contract any diseases [User, Mombasa]

> To prevent those, I mean early pregnancies, young girls, to the teenage they should use those coils, the contraceptives to prevent early pregnancy, STI and AIDS [Non-user, Kisumu]

In other cases, respondents were familiar with different methods, but not with how they were appropriately used.

> The woman inserts it (pill in the vagina) so that she doesn't get pregnant [Non-user, Kisumu]

> Those things are harmful, I saw once, one have to be cut open somewhere here and they insert the coil then they stitch the area, I don't know those are the coils and it last for I don't know twenty years [Non-user, Kisumu]

In terms of their personal experience with family planning, it is interesting to note that not all participants correctly identified themselves as 'users' or 'non-users': those who used condoms described themselves as 'non-users'. This finding is based on the perception that condoms are not reliable for pregnancy prevention due to the potential for the method's failure. The quote below illustrates this view:

> I always thought that condoms were used to prevent diseases like HIV but not pregnancies because I was using the condoms but I still got pregnant. The day it burst is the day I conceived. So I would not say that a condom is a family planning method [Non-user, Mombasa]

Barriers to family planning use

Myths about contraceptives

Among the respondents, fear and concerns about family planning were a major barrier to use. Many of their fears were based on myths and misconceptions. The largest concern cited by participants was fear that a particular method would render them infertile; in many cases, this prevented them from using contraception.

> I think the pills are not good and even my mum has warned me severally not to use pills because there will come a time when I might need to have a children and I might not be able to get one in future. You don't get pregnant (IF YOU USE PILLS) [Non-user, Mombasa]

> If they put that (implants) on you when you remove it (implants) you cannot give birth again [User, Kisumu]

> Some say that you, you might never give birth if you are used to taking the injections [Non-user, Kisumu]

While infertility was cited as a possible consequence of most methods, it was most strongly expressed around

injectables. As a result, many young women believed that injectables were only recommended for women who already had children.

> There are some who love the injection but they advise the ladies who are here that they should only go for the injection only if they have ever given birth before, that it's not good to go if they've never given birth, they should go for the injection after [Non-user, Kisumu]

Participants also believed that it was possible that modern contraception methods could cause temporary infertility or reduce one's childbearing capacity, limiting the number of children they were able to conceive in their lifetime.

> I have little faith in pills…it (pills) affects me in that I cannot be able to give birth to many children [User, Mombasa]

> She (mum) said it (pills) can cause infertility…can take long before conceiving [Non-user, Kisumu]

Another cited barrier to family planning use is the association of modern contraceptives with birth defects or abnormalities.

> I think people like the injection more…Pills are very bad and I don't like anything to do with them…if you take the pill for so long, you may give birth to a paralyzed child… [User, Mombasa]

> You hear that someone was pregnant and they got pregnant while using the pills and then you start worrying if you will give birth to a normal child or you will give a child without hands [Non-user, Mombasa]

A number of participants expressed concerns about contraceptives as a foreign object that could disrupt the natural processes of the body and create harm. Failure to menstruate regularly, a common side effect from using certain contraceptive methods, was interpreted as causing the body to retain 'dirty blood' and leading to stomach aches.

> Some fear that they will not receive their period when they use them (referring to contraceptives) and that blood is dirty and should come out [User, Kisumu]

Condoms were associated with discomfort and irritation from the lubricant, which they feared may cause an infection. Methods such as the coil or implant that were inserted were seen as having the potential to harm one's internal organs.

A large number of respondents, especially those from Kisumu, also reported having heard or believing that the use of certain contraceptive methods, especially pills, led to cancer.

> Many of them (community women) say that the pills are not good because they can accumulate under the abdomen and cause something like cancer; so many people don't like those pills [Non-user, Kisumu]

Fear of side effects

In addition to the myths described above, many also mentioned real side effects as a barrier to use. The most common side effects expressed by the respondents were weight changes, bleeding, and lack of sexual desire. Headaches and blood pressure issues were also cited by a few.

All of the methods were associated with potential changes in weight, with some methods associated with weight gain (notably the injectable) and others with weight loss.

> Injectable, I feel they are not good as they have side effects; they change your physical appearance, very fat, very many people get very fat [User, Mombasa]

> I don't know if its maybe I used them (pills) for a long time the first time and that's why they (pills) are affecting me? They (pills) make me loose appetite and I start getting thin because I don't eat [User, Mombasa]

Heavy bleeding was also associated with modern family planning methods.

> The periods are so heavy till they feel like they are not menstruating, it's like they are bleeding pure blood. [Non-user, Mombasa]

> And others I heard that they receive their periods like the entire month when they are using these family planning methods. Like Norplant there is a friend who had periods throughout the month until she had it removed [Non-user, Mombasa]

Respondents also reported hearing that modern family planning reduces sexual desire.

> All these family planning methods interfere with our feelings (libido) be it a coil, be it a tablet, (pills) be it what, I heard that it (modern family planning) reduces feelings [User, Mombasa]

> Injectable I heard they make a woman "to be cold". They lead to lack of sexual arousal just like the coil. There are some who have side effects by the way you "don't have any feelings (sexual urge) [Non-user, Mombasa]

> Sometimes they complain because of the way they (pills) make you feel tired, bring mood swings and sometimes you have a low libido. This will make him complain because he will start accusing you that you are being unfaithful to him [User, Mombasa]

Association with promiscuity and straying

There were notions that the use of modern contraceptive methods encouraged young women to become sexually promiscuous. Both users and non-users expressed the belief that the partners of young women who use contraceptives felt that they encouraged the women to be unfaithful. For instance, a non-user from Mombasa stated:

> And so they (men) say that only promiscuous women use the pills and that is why they are against those pills [Non-user, Mombasa]

However, this seemed to be a belief held by the male partners and not the women themselves. Another respondent from Mombasa, this time a user, also stated that:

> Sometimes they (men) accuse you of being unfaithful in the relationship [User, Mombasa]

The issue of modern contraceptives being associated with lack of trust was reported to have been discussed during youth meetings in the community, as mentioned by one of the respondents who said:

> We have discussions at some youth meetings we go for, they say that using the condoms means that you don't trust your girlfriend [Non-user, Kisumu]

Another respondent remarked that:

> With the pills they (men) are very... much against it and they feel that with the pills their women can have extra marital affairs knowing that they will not get pregnant [Non-user, Mombasa]

Some young women thought that condoms were not a suitable method of contraception for couples in relationships because of their association with straying.

> They (community members) don't use condoms because they are married and you cannot use them with your husband when you are married. Maybe if you are having an affair, I don't like condoms because, I have a husband that I live with so I don't see why I should use condoms and I am not straying. [Non-user, Mombasa]

The role of others in influencing contraceptive use

As demonstrated by the repeated use of the third person pronouns ('he', 'she', 'they', 'others') in almost all of the above quotes, young women learn about both true side effects and myths from others in their community - peers, family or partners. Often these women received inaccurate information and were directly counselled by others not to engage with or use family planning methods.

> They don't like it (modern FP) at all, they tell me not to use pills, don't use family planning, it will affect your fertility...when they hear that a girl has been taken to get an operation maybe she has an appendix...they will say that it has been caused by family planning [User, Mombasa]

> I heard of a woman who got pregnant while using the coil. And she had some difficulties while giving birth, she had to go to the hospital and undergo an operation [Non-user, Mombasa]

> If the advice I get from the community is good then there is no need to go to hospital, in my community we don't use pills or the injection but we do it on our own and we are able to plan properly [Non-user, Mombasa]

> I used to hear people say that they're (modern FP methods) bad especially when I was a girl they'd say it would harm my body, like being unable to conceive [User, Kisumu]

Women also shared concerns raised by their spouses or partners on use of contraceptives, which echoed their own concerns about outcomes and side effects. Male partners raised concerns about family planning diminishing sexual urges, resulting in birth defects, or discomfort during sex.

> There are some men who don't want their women to use the planning methods, some men say that the medicines will result in messing up their reproductive organs [User, Thika]

> They (men) say that when you get the injection you are no longer aroused, Some (men) say when they use the condom it affects that thing (penis), When he is through he feels a lot of pain the next day [User, Kisumu]

There was also a suggestion that men prevent women from using family planning to increase the number of their progeny.

> Men do not like because they (men) want their wives to give birth to as many children as possible as they can [Non-user, Kisumu]

Discussion

Most respondents are aware of contraceptives and, generally, knowledge of modern contraceptive methods was high. The majority of respondents knew at least one modern method of contraception. This is in line with findings from the Kenya DHS that demonstrated knowledge of contraceptives is almost universal [4]. Yet despite this high level of knowledge, use - particularly among young women - remains low. This finding that knowledge of contraception is not necessarily correlated with use has been shown in the research of others [9,20].

Knowledge of use and potential side effects varied between respondents, and between methods. For example, although the majority of respondents correctly understand that condoms offered dual protection, some felt that condoms were not reliable for pregnancy prevention. Furthermore, some participants who used condoms did not describe themselves as 'users' of family planning. This suggests that the condom is not classified as a method of contraception.

Many women report hearing about health related problems from the use of contraceptives, including: total or temporary infertility, birth defects and abnormalities, disruption of their normal body processes or inability to menstruate regularly. Similar findings of health related concerns in Kenya are reported in a study on discontinuation of injectables [14]. The Kenya DHS reports health related concerns as the second most common reason for non-use or contraceptive discontinuation [4].

Side effects were mentioned by a majority of the young women as one of their greatest fears. The main side effects mentioned were weight gain, lack of sexual desire, headaches and blood pressure. These results are supported by the Kenya DHS that found, overall, 36% of women report discontinuation within the first 12 months of using a method due to side effects; and 16% of married women not currently using were not doing so due to fear of side effects (Kenya National Bureau of Statistics (KNBS) and ICF Macro 2009). Disruption of menstrual cycle was the most common reported reason for discontinuation of hormonal methods among women in Nyando district, Kenya [14]. A study in Tanzania also found fear of side effects as the main reason for discontinuation and non-use of family planning [21].

While previous studies have focused on user and method related reasons for discontinuation or non-use, little focus has been placed on the influence of others [14]. In our research, health providers and other educational sources were rarely mentioned as the source of information on contraception. Instead, peers and other community members acted as the main sources, and their perceptions also heavily influenced the decision to use or not. However, as the quotes show, these sources often propagated myths (infertility, birth defects) and exaggerated rare side effects (uncontrollable bleeding, enormous weight gain/loss). These findings are in line with other studies, for example, the influence of others' perceptions - propagated through hearsay - was also found in a study among youth in Kisumu [9]. Meanwhile, other studies report a similar over exaggeration of side effects as a result of myths and misconceptions held by a community [21,22].

Our findings support evidence that women do not make decisions to use contraceptives in isolation, but in consultation with others in their social networks [10,12,13,23]. Both information and misinformation are spread through social networks. In this way, networks provide an opportunity to encourage or discourage use; a way of sharing potentially positive information on contraceptive technologies but also a channel for rumours, which may negatively influence use [23,24]. The spread of myths by social networks in the community is demonstrated by a longitudinal study in Nyanza, Kenya [23,25]. Myths are learned from childhood: a project collecting anonymous questions from children in Kenya demonstrated several misconceptions about the efficacy of condoms [26]. An interesting finding in Kenya, which our quotes also suggest, is that men and women were influenced more by their perception of their social network's approval of family planning than by their own approval [23].

Within the social network, our findings point to the importance of partner views in determining use or non-use of modern contraceptives. In a study in Kenya, partner's influence was found to be a key barrier, based on the husband's desire to exert influence on childbearing and unfounded concerns about family planning methods [13]. Partners were reported not to accept the use of some methods because they associated them with poor health, infertility, birth defects, infidelity and promiscuity [14]. Contraceptives were also seen by partners to reduce a woman's libido, thereby interfering with marriage, and sometimes resulting in less pleasure during sex [13]. A study in Nyanza, Kenya, further confirms that women do not always have control on the start and discontinuation of a contraceptive; it is their husbands or other influential people in their community or household who make the decision [10]. Much of this opposition, they report, was due to low levels of knowledge regarding side effects and cultural beliefs around sex and fertility [10].

Programmatic implications

Demographers and health planners have typically based programmes on 'individualistic rational -actor models' [25]. However, as this and other research suggests [10,12,13,23], social networks are key in perpetuating myths that act as barriers to uptake. These findings stress the influence of social network approval on the use of family planning, above the individual's beliefs. In such settings, family planning programming should utilize innovative strategies to override myths and rumours, for example, intensive couple and peer counselling [12]. This research also highlights the importance of engaging with the wider community (mass strategies and peer strategies) in programming, as well as the importance of understanding the way information is spread informally in Kenyan society. Especially among youth, social media offers a new opportunity to spread information rapidly and effectively, in order to remove barriers and drive demand for contraception.

As an outcome from this study, PS Kenya developed a campaign called the 'C-word'. This national campaign includes messages to address key myths and misconceptions identified, specifically: Contraceptives cause weight gain; Contraceptives can cause infertility; Condoms are not effective in preventing pregnancy; Contraception is women's business; and Contraceptives can cause cancer. These are currently being exposed to the target audience through radio, TV, online and social media. Additionally, interpersonal communication activities on the ground seek to challenge beliefs that regular contraceptives are for older women only, contraceptives are not safe, will cause infertility, as well as other method specific issues exposed by this study. The aim of all these activities is to address misinformation and increase modern contraceptive uptake among young Kenyans.

Conclusions

Findings from this research confirm that awareness and knowledge of contraception do not necessarily translate to use. The main barriers to modern contraceptive uptake among young women in Kenya are myths and misconceptions, with both users and non-users exhibiting lack of factual information on the different contraceptive methods. Social networks influence contraceptive use by exaggerating side effects and spreading myths.

The data from this study highlights the social nature of beliefs and behaviours around family planning. The decision to use or not is primarily influenced by others from within the social network, whose views and perceptions are often more important than an individual's own. Therefore, family planning campaigns should look beyond the individual - to social networks - in order to drive demand and remove barriers.

The influence of social networks on health behaviours is relatively under-researched. Exploring the mechanisms by which social networks influence decision making is thus suggested as an area for future research. To complement this analysis, anthropological research to examine the cultural norms that underlie social networks is also recommended, to help develop programmes that can target the cultural barriers to family planning in Kenya.

Partner influence also remains key and so it is important that myths and unfounded concerns raised by male partners are addressed, for example, by designing male friendly interventions. We recommend that the Ministry of health takes up these findings by coming up with policies on comprehensive sexuality education that will also include facts about contraception. This study focussed on young women only. Further research with men, whose influence on contraception demand and uptake has been well noted is, therefore, recommended to help inform new programming.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

RO: Participated in the overall conceptualization and inception of the idea of this manuscript, with lead roles in conducting literature review, data analysis, writing the results and discussion sections. MM: assisted in conceptualization and writing the results section. SA: drafted the methodology section, SK: supported with drafting the recommendations section. RT: prepared the abstract and background, supported the lead author in writing other sections and was responsible for editing. MT: provided overall guidance and review of the manuscript with particular attention on how it adds to the body of literature in Kenya. MK assisted with conceptualization, background and methodology sections, as well as overall review. All the authors read and approved the final manuscript.

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Article 2

4.2 Unintended pregnancy and subsequent use of modern contraceptive among slum and non-slum women in Nairobi, Kenya

Jean Christophe Fotso, Chimaraoke Izugbara, Teresa Saliku and Rhoune Ochako

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This article addresses Objective 1 that seeks to get insights into the prevalence and predictors of contraceptive use among vulnerable populations. The study was conducted among women living in two slum settlements and two non-slum settlements in Nairobi. The findings of the study demonstrate that the experience of an unintended pregnancy may act as a trigger for contraceptive use by increasing risk perception among women. We recommend the use of antenatal, delivery, and post-delivery care services to target women whose pregnancies are unplanned, and target them with information and family planning services to prevent a repeat if unplanned pregnancy.

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RESEARCH ARTICLE Open Access

Unintended pregnancy and subsequent use of modern contraceptive among slum and non-slum women in Nairobi, Kenya

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Abstract

Background: In spite of major gains in contraceptive prevalence over the last few decades, many women in most parts of the developing world who would like to delay or avoid pregnancy do not use any method of contraception. This paper seeks to: a) examine whether experiencing an unintended pregnancy is associated with future use of contraception controlling for a number factors including poverty at the household and community levels; and b) investigate the mechanisms through which experiencing an unintended pregnancy leads to uptake of contraception.

Methods: Quantitative and qualitative data from a cross-sectional research project conducted in 2009/10 in two slum settlements and two non-slum settings of Nairobi, Kenya are used. The quantitative component of the project was based on a random sample of 1,259 women aged 15–49 years. Logistic regression models were used to assess the effect of unintended pregnancy on future contraceptive use. The qualitative component of the project successfully interviewed a total of 80 women randomly selected from survey participants who had reported having at least one unintended pregnancy.

Results: Women whose last pregnancy was unintended were more likely to be using a modern method of contraception, compared to their peers whose last pregnancy was intended, especially among the wealthier group as shown in the interaction model. Among poor women, unintended pregnancy was not associated with subsequent use of contraception. The qualitative investigation with women who had an unplanned pregnancy reveals that experiencing an unintended pregnancy seems to have served as a "wake-up call", resulting in greater attention to personal risks, including increased interest in pregnancy prevention. For some women, unintended pregnancy was a consequence of strong opposition by their partners to family planning, while others reported they started using contraceptives following their unintended pregnancy, but discontinued after experiencing side effects.

Conclusion: This study provides quantitative and qualitative evidence that women who have had an unintended pregnancy are "*ready for change*". Family planning programs may use the contacts with antenatal, delivery and post-delivery care system as an opportunity to identify women whose pregnancy is unplanned, and target them with information and services.

Keywords: Unintended pregnancy, Unplanned pregnancy, Contraceptive use, Urban poor, Kenya

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Background

In spite of major gains in contraceptive prevalence over the last few decades, many women in most parts of the developing world and in sub-Saharan Africa in particular, who would like to delay or avoid pregnancy, do not use any method of contraception [1,2]. Each year, in the developing world, only about half of the women at risk of experiencing unintended pregnancy use a modern method of contraception [1]. As a result, women in developing countries have 75 million unintended pregnancies annually, representing about a third of all the pregnancies that occur in the region [3], a proportion which varies from as low as 10% in some sub-Saharan African countries to as high as 65% in others [4].

The health and social consequences of unintended pregnancy are amply documented, and its implications for the achievement of the Millennium Development Goals (MDGs) are now well understood [5,6]. Unintended pregnancy has been shown to adversely influence maternal and child health seeking behaviors, birth outcomes, and women's quality of life [7,8], and to contribute to unsafe abortion [9]. Increasing the uptake of more effective contraceptive methods is thus a necessary first step towards reducing unplanned pregnancy and the vicious cycle of poverty and poor reproductive health [4,6].

Several studies have explored the association between contraceptive use and women's risk for unintended pregnancy. These studies have generally related unintended conception among women to contraceptive behavior, types of contraceptives, as well as the consistency and correctness of use [2,4,8,10]. In contrast, much less is known about the possible effects of experiencing an unintended pregnancy on future contraceptive use, despite evidence that an unplanned pregnancy is a risk factor for a subsequent unplanned pregnancy [11]. Where evidence exists, it has largely drawn on data from western contexts [12,13], and focused primarily on unmarried adolescent girls, neglecting adult and married women who are also often at heightened risk for unintended pregnancy. In a study of 424 American women aged 14–25 years, Matteson et al. [12] concluded that a past unplanned pregnancy was not associated with contraceptive use. However, they recommended further studies on the relationship and speculated that factors that inhibit contraceptive use (e.g. lack of access, fear of side effects) may have overshadowed the motivation for contraceptive use provided by an unplanned pregnancy. In Orcutt & Cooper [13], American female adolescents who had experienced an unplanned pregnancy appeared to have the fastest increase in contraceptive uptake, but the authors suggested that the difference may be explained –at least partly- by the study design, in particular the time between the survey waves.

The current study attempts to extend understanding of the association of unintended pregnancy and contraceptive use by analyzing data collected from a sample of girls and women in Nairobi, Kenya. It hypothesizes that the occurrence of an unintended pregnancy is associated with future uptake of contraception, through mechanisms including a "wake-up call" for greater attention to personal risks and increased interest in pregnancy prevention. Its main objectives are thus to: a) examine whether experiencing an unintended pregnancy is associated with future use of contraception, controlling for a number factors including socio-economic status (SES) at the household and community levels; and b) investigate the mechanisms through which experiencing an unintended pregnancy leads to uptake of contraception.

Context

Kenya offers a particularly interesting context for investigating women's fertility practices and matters related to unintended pregnancy. The country has persistently boasted one of the highest contraceptive prevalence rates in Africa from 33% in 1993 to 46% in 2008/09, but the level of unintended childbearing has remained among the highest in the region and has declined only sluggishly during the 15-year period, from 50.9 to 42.6 percent [14,15]. Unintended fertility has contributed to Kenya's rapid population growth and was cited as a major factor in the recent revision of Kenya's projected population for 2050 from 54 to 83 million people [16]. Further, unintended pregnancy is a leading cause of unsafe abortion, contributing immensely to high levels of maternal mortality and morbidity in the country, with about 900 deaths occurring per 100,000 abortions in the country [17].

The high levels of unintended pregnancy in Kenya are related to poor access to, and use of, modern contraceptive services and products. On the supply side, facilities that provide subsidized family planning products and services regularly experience both stock outs and a dearth of qualified providers [18], while on the demand side, stigma, inadequate sexuality information, and cultural pressure inhibit the utilization of family planning services among women and girls in Kenya [19,20].

Why should we pay attention to urban populations?

Sub-Saharan Africa is experiencing an urban explosion, with half of its population expected to be living in cities by 2030–2035. Following this trend, Kenya's urban population grew from about half a million in 1960 to nearly 2.5 million in 1980, further increased to about 9 million in 2010 - constituting about 40% of the total population – and is projected to reach 40 million by 2050 [21]. The urban population explosion in most countries of sub-Saharan Africa has been occurring in the context of growing urban poverty, as manifested by the mushrooming of

informal settlements and shantytowns that are characterized by poor access to healthcare and reproductive health (RH) services, early sexual debut and high-risk sexual behaviors [20,22]. Importantly, across sub-Saharan Africa, there are significant inequities in health and RH outcomes in urban settings, with the urban poor tending to have not only the lowest contraceptive use, but also the highest fertility and the highest unmet need for family planning [22,23].

Methods

Data

The current paper uses a mix of quantitative and qualitative data from a cross-sectional research project conducted in 2009/10 in two non-slum settings (Harambee and Jericho) and two slum settlements (Korogocho and Viwandani) in Nairobi, Kenya. The settlements form the Nairobi Urban Health and Demographic Surveillance System (NUHDSS), a research platform of the African Population and Health Research Center (APHRC). Korogocho and Viwandani are densely populated settlements characterized by high unemployment and poverty levels, crime, poor sanitation and high prevalence of risky sexual behaviors and poor sexual and reproductive health outcomes, compared to Nairobi as a whole [20,24]. Jericho and Harambee, on the other hand, are middle-class settings, and enjoy better health and other indicators [25].

The quantitative component of the research project was based on a sample of randomly-selected women aged 15–49 years, using a two-stage sampling procedure. In the first stage, 1,000 households from the two slum settlements and 1,000 households from the two non-slum settings were drawn from the NUHDSS, while the second stage consisted of a random selection of one eligible woman (usual resident aged 15–49) in each of the sampled households [26]. The sample size was based on the practice by the demographic and health surveys (DHS), which typically assume that to obtain reasonable precision for most indicators, at least 800 completed interviews of women 15–49 are needed in each domain. Accounting for possible missing data and non-responses, the sample size was set to 1,000 per area. The questionnaire sought information on respondents' social, economic, demographic, pregnancy and birth histories (including miscarriages and abortions, stillbirths, and neonatal deaths), the intendedness of all pregnancies mentioned by the respondent irrespective of their outcomes, current use of contraception and particular methods used. A total of 1,962 women were successfully interviewed, yielding a response rate of 98.1%. For the purpose of this study, we restrict the sample to women whose last births or last pregnancy termination occurred in the five years preceding the survey. Besides, women who did not respond to the question on whether they were taking action to avoid pregnancy, had never had a pregnancy, had never had sex, or were pregnant at the time of the survey, were excluded, resulting in a final sample of 1,259 women. This dataset is used to address the first objective of the paper.

The qualitative component of the project successfully interviewed a total of 80 women (40 from the slum settings and 40 from the non-slum settings) randomly selected from survey participants who had reported having at least one unintended. In-depth interview was used to elicit information on views and experiences of unintended pregnancy and contraceptive use, among other topics. These interviews are utilized to investigate the possible mechanisms through which experiencing an unintended pregnancy hinders or leads to uptake of contraception. The sample size of 80 women, though arbitrary, was motivated largely by a concern with analytical expediency, aimed to help us achieve maximum variation sampling, which ensures representation of diverse dimensions of the issue being explored. Interviews were conducted using an in-depth individual qualitative interviewing guide that was administered in Swahili by four trained and highly-experienced female qualitative interviewers. The training was conducted by expert qualitative researchers and introduced the fieldworkers to the aims of the study, familiarized them with the study guide, and exposed them to guided dialogue techniques and critical tips for qualitative interviewing. The fieldworkers were mostly university graduates or students and were employees of APHRC's NUHDSS at the time of the study. Overall, the research adhered to the guidelines for qualitative research review (RATS) which can be found at http://www.biomedcentral.com/authors/rats.

Variables

The dependent variable is women's current use of a modern contraceptive method (defined as sterilization, intrauterine device, injections, implant, pills, male condom, female condom, emergency contraception, lactational amenorrhea, and spermicides). The main predictor of modern contraceptive use is the planning status of the last pregnancy (mistimed/unwanted or not). The independent variables include place of residence (slum or non-slum); household wealth computed from household possessions, amenities and dwelling characteristics using principal components analysis [27] and recoded as tertiles (Low, Middle, High); respondent's education, marital status, parity, age and ethnicity; and the time since the last birth or last pregnancy termination. The household wealth variable was computed from the overall sample (slum and non-slum settings). Of interest is the comparison of the influence on contraceptive use of SES at the household level (household wealth) and neighborhood

levels (slums and non-slums). Fertility preferences and other determinants of contraceptive use such as knowledge about family planning, access to health information and services, discussion between couples and cultural barriers, are not available in the data, as the research project's primary focus was to understand the magnitude of, and disparities in unplanned pregnancy in the study communities.

Data analysis

The analyses were carried out in three steps. First, prevalence of unintended pregnancy and modern contraceptive use were estimated, and chi-square tests used to examine differences across the independent variables presented above. Second, a multivariate logistic regression analysis was conducted to assess the net effect of pregnancy *intendedness* on future contraceptive use. Third, interactions between unintended pregnancy on the one hand, and household wealth and slum/non-slum residence on the other hand, allowed us to examine the extent to which the effect of unintended pregnancy and future contraceptive use varies by socio-economic status (SES). The transcribed in-depth interviews (IDIs) were analyzed using an inductive approach involving thematic assessment of the narratives. Where applicable, quotations from the study participants are used to epitomize emerging issues and themes. To protect the identity of respondents, we have used pseudonyms throughout the paper. The STATA software was used for the management and analysis of the quantitative data.

Ethical considerations

The project received ethical approval from the Kenya Medical Research Institute, and written informed consent was obtained from study participants before the interviews. Women in need of information or services were referred to appropriate facilities and organizations according to the protocols in place in the NUHDSS.

Results

Sample characteristics

As shown in Table 1, 58% of women from the study sample were from the slum settings. The household wealth variable was constructed on the sample of all households and as a result, is not evenly distributed among women in the sample. Nearly 35% of women had secondary-level education, while close to one-fifth had tertiary level education, a proportion comparable to the figure drawn from the urban sample of the 2008/09 Kenya demographic and health survey (18%). Majority of respondents were currently married, had given birth to two or three children, or were aged 25–34 years. Table 2 shows the characteristics of participants in the qualitative interviews. Majority of them had none or primary education, were currently married, had two children or more, and were aged between 35 and 49.

Table 1 Sample Characteristics for the analysis of last pregnancies; Nairobi, Kenya

Variables	%	N
Study site		
Slum	57.7	727
Non-slum	42.3	532
Household wealth[1]		
Lowest (Poor)	37.3	470
Middle	31.9	401
Highest (Rich)	30.8	388
Education		
None/primary	46.0	579
Secondary	34.5	434
Tertiary	19.5	246
Parity		
0-1	31.5	396
2-3	48.8	614
4+	19.8	249
Age		
<25	18.6	234
25-34	43.0	541
35-49	38.4	484
Marital status		
Currently married	61.7	777
Formerly married	22.2	279
Never married	16.1	203
Ethnicity		
Kikuyu	33.8	425
Luya	18.0	227
Luo	16.9	213
Kamba	19.2	242
Others	12.1	152
Time since last birth/pregnancy termination		
<18 months	27.3	344
18-35 months	22.6	284
36-59 months	50.1	631
N		1,259

[1]The distribution is 35.6% (Lowest), 32.2% (Middle), and 32.2% (Highest) in the slum setting; and 39.7% (Lowest), 31.4% (Middle), and 28.9% (Highest) in the non-slum sites.

Patterns of unintended pregnancy and modern contraceptive use

Table 3 shows the magnitude of unintended pregnancy in the study areas, and its bivariate association with background characteristics. About 24% of women reported that

Table 2 Background characteristics of women involved in the qualitative investigation

Variables	N	%
Education		
None/primary	37	46.3
Secondary	28	35.0
Tertiary	15	18.8
Marital status		
Currently married	47	58.8
Formerly married	15	18.8
Never married	18	22.5
Parity		
0-1	22	27.5
2-3	31	38.8
4+	27	33.8
Age		
<25	20	25.0
25-34	26	32.5
35-49	34	42.5
Residence		
Slum settings	41	51.3
Non-slum settings	39	48.8
N	80	100.0

their last pregnancy was unintended (either mistimed or unwanted), with higher levels in non-slums compared to slum areas (p = 0.022). Noticeably, the results show a pattern of steady decline of unintended pregnancy with increased household wealth (p = 0.011). The level of unintended pregnancy was highest among never married individuals (61.6%).

Table 3 also shows that modern contraceptive prevalence rate (CPR) stands at 47.6% in the study areas, with higher levels recorded in the non-slum settings (p = 0.041). Women's parity, age and marital status display statistically significant associations with use of a modern method of contraception (p = 0.000 in all three cases), with the highest rate recorded among currently married women (54.7%). As expected, use of contraceptive decreases with the length of time since the last birth or last pregnancy termination (p = 0.000).

Unintended pregnancy and contraceptive use

Table 4 presents the results of the multivariate analysis. The key finding is that controlling for possible confounding factors, women whose last pregnancy was either mistimed or unwanted, were more likely to be using a modern method of contraception, compared to their peers whose last pregnancy was wanted (p = 0.030).

Table 4 also shows that non-slum residents are more likely to use modern contraceptive, compared with slum residents (p = 0.012). This effect of SES observed at the community level (non-slum being considered wealthier than slum residents) is not apparent at the household and individual levels. Indeed the effect of household wealth is not statistically insignificant (as noted in the bivariate analysis), while that of education shows no difference between secondary and tertiary education. The ethnic differences in the use of contraception or the effect of time since the last birth/pregnancy termination are not statistically significant in the multivariate analysis. Noticeably, marital status and age remain the strongest predictors of modern contraceptive use. Currently married women were about 2.7 times as likely as their formerly married counterparts to be using a modern contraceptive method (p = 0.000). As for age, women aged less than 35 years were nearly 2.5 times more likely than their older peers (aged 35–49), to be using a modern method of contraception (p = 0.000).

Does the association vary by SES?

In Table 4, the interaction between unintended pregnancy and slum/non-slum residence was not statistically significant, indicating that the effect of unintended pregnancy does not vary significantly between the slum and non-slum areas. The interaction with household wealth on the other hand, shows that the effect of unintended pregnancy is significantly stronger among non-poor households (middle and rich households). It is notable that among women from poor households, experiencing an unintended pregnancy was not statistically associated with future use of a method of contraception.

Unintended pregnancy and future contraceptive use practices: Possible mechanisms

Findings from the qualitative study suggest that several women who reported an unintended pregnancy did not want to have a repeat episode of the same. While evident in many of the narratives we collected, one of the most poignant articulations of this point was by a 25-year old respondent who noted *'I was confused and helpless … when I found that I was pregnant. It was not easy for me. I would not want to go through that again'.* The women we studied generally acknowledged being deeply troubled and distressed by their unintended pregnancies. Several of them admitted panicking, experiencing anxiety, and not knowing who to talk to or where to seek help. Largely because of shame and stigma, many of the women interviewed could not tell family members, partners and friends of their plight.

The narratives of the women we interviewed generally suggested that the experience of an unintended pregnancy jolted them and presented them with both a

Table 3 Patterns of unintended pregnancy and contraceptive use among women in slum and non-slum settings of Nairobi, Kenya

	Unintended pregnancy	Current modern contraceptive use
Overall	23.7	47.6
Study site	p = 0.022	p = 0.041
Slum	21.3	45.1
Non-slum	26.9	50.9
Household wealth	p = 0.011	p = 0.287
Lowest	27.2	50.0
Middle	24.2	47.6
Highest	18.6	44.6
Education	p = 0.864	p = 0.215
None/primary	23.0	44.9
Secondary	24.2	49.8
Tertiary	24.4	50.0
Parity	p = 0.000	p = 0.000
0-1	35.4	46.7
2-3	16.6	52.8
4+	22.5	36.1
Age	p = 0.000	p = 0.000
<25	37.0	52.6
25-34	21.4	56.0
35-49	19.2	35.7
Marital status	p = 0.000	p = 0.000
Currently married	13.1	54.7
Formerly married	25.5	33.0
Never married	61.6	40.4
Ethnicity	p = 0.000	p = 0.552
Kikuyu	20.2	46.6
Luya	30.0	46.7
Luo	33.8	48.8
Kamba	19.0	51.7
Others	17.1	43.4
Time since last birth/pregnancy termination		
<18 months		53.5
18-35 months		52.8
36-59 months		42.0
N	298	599

wake-up call and an opportunity to reassess their relationships, sexual and contraceptive practices and behaviors, and life situations. Driving this point home, a 28-year unmarried respondent noted: *'It was scary for me, and taught me a lot... about the boy I had called my friend. From that pregnancy, I learnt a lot about men that has stayed with me'*. There was also a 25-year old married respondent who reported that she made a decision to avoid unprotected sex following her unplanned pregnancy. Experiencing an unintended pregnancy also encouraged women to discuss family planning and contraception with their partners and to demand the use of condoms to avoid another pregnancy. As one 27-year old unmarried respondent put it: *'The pregnancy disturbed me and I am like I won't want to go through that kind of experience again. My partner told me that I have changed, I have become rebellious, I don't want to do some things and it is due to the fact that when my mind tells me I am not protected, that is it. And so I am like if you don't want to use a condom or something, I don't want it. Sometimes we end up fighting'*.

In explaining their decision to begin to use a contraceptive method, several women in the study often made reference to the crisis and difficulties they faced when they found out about their accidental pregnancies. For one married 37-year old mother of four, her unintended pregnancy caused her so much anxiety and worry. She unwillingly carried the pregnancy to term, but obtained tubal ligation immediately after the delivery. She noted: *'I fear [to get pregnant], so I had to go for tubal ligation so I cannot have other children now... I would have liked to have as many as possible children but when I look at the problems I would go through, I am better off now'*. The prevention of future unintended pregnancy and abortion was considered important. Another currently married 35-year-old respondent noted: *'Yes, I don't want anything to do with that at all. Abortion is a risky affair and anything can happen to you; it is something you are doing but scared of the eventuality. The processes you pass before you are able to secure an abortion whether it is done by the doctor or not, are so long and the whole situation is really scary. It is something you are conscious about that you are doing some wrong.'*

Following an unintended pregnancy, some women also decided to use contraceptives because it protected their reputation. When asked what bothered them most about their unintended pregnancy, some of the women focused on issues of perception by the community, peers, and family. A good example is this 23 year old, who told us: *'When I found out that I was pregnant, my greatest worry was what people would think of me...that I was a prostitute. If they found out about the pregnancy, they would say that one is a spoilt (immoral) girl'*. Similar sentiments were expressed by a 40-year-old respondent that she accidentally became pregnant soon after her husband's death, when the mourning was still ongoing.

Unwanted pregnancies also worsened livelihoods for some of the women. For instance, one 34-year-old respondent told us that she already had two children, when she became pregnant unintentionally. While she

Table 4 Multivariate results of the determinants of contraceptive use among women in slum and non-slum settings of Nairobi, Kenya

	Main effects		Interaction: Unintended pregnancy and slum/non-slum residence		Interaction: Unintended pregnancy and household wealth	
	Odds ratio	P-value	Odds ratio	P-value	Odds ratio	P-value
Unintended pregnancy [Ref: No]						
Yes	1.41	0.030*	1.53	0.034*	0.84	0.458
Study site [Ref: Slum]						
Non-slum	1.50	0.012*				
Household wealth [Ref: Low (Poor)]						
Middle	0.96	0.785				
High (Rich)	0.81	0.160				
Education [Ref: None/primary]						
Secondary	1.14	0.371				
Tertiary	1.08	0.716				
Household size [Ref: 1–2]						
3-5	1.24	0.323				
6+	1.60	0.047*				
Age [Ref: 35–49]	1.00					
<25	2.59	0.000***				
25-34	2.48	0.000***				
Marital status [Ref: Never married]	1.00					
Formerly married	1.06	0.237				
Currently married	2.71	0.000***				
Ethnicity [Ref: Kikuyu]						
Luya	0.85	0.344				
Luo	0.91	0.623				
Kamba	0.92	0.614				
Others	0.69	0.067†				
Time since last birth/end of pregnancy [Ref: <18 months]						
18-35 months	1.05	0.769				
36-59 months	0.89	0.463				
Interaction: Unintended pregnancy and slum/non-slum residence						
Unintended pregnancy × Non-slum			0.83	0.505		
Interaction: Unintended pregnancy and household wealth						
Unintended pregnancy × Middle					2.50	0.006**
Unintended pregnancy × Rich					2.22	0.023*

†p < .10; *p < .05; **p < .01; ***p < .001.

carried the third pregnancy to term, she told us: *'I struggle every day to support them. I knew three children will be too much for me, that is why I did not… another child.'* As this respondent told us, she had no choice but to go for tubal ligation.

However, not all the women who experienced an unplanned pregnancy used modern method of contraception afterwards. While some respondents, particularly unmarried young women resorted to abstinence, others reported that they did not use contraceptives because it was dangerous and had potential to harm them. There were also women who reported that they started using contraceptives following their unintended pregnancies, but discontinued after experiencing side effects.

Discussion

The focus of this study is on the extent to which unintended pregnancy affects future use of modern contraceptive methods. A major limitation, which also applies to most investigations on unwanted fertility, is the difficulty

to accurately capture the very concept of unintended pregnancy, as a number of authors have reported a tendency of women to revise the status of a pregnancy after birth [28,29]. Further, due to the small sample size of this study, we combined mistimed and unwanted pregnancies, and considered their joint influence on contraceptive use. As acknowledged by D'Angelo et al. [30], mistimed pregnancies and unwanted pregnancies may have different consequences and may affect subsequent use of contraception differently.

Another limitation of the analysis is related to the possibility that a woman may change her decision to use or not to use a contraceptive method more than once during the period between the birth of her last child or the termination of her last pregnancy, and the time of the interview. We sought to address this last issue using a multivariate model that controls for the length of time since the last birth or last pregnancy termination. Also, there may be a bi-directional relationship between unintended pregnancy and contraceptive use, with unobserved factors affecting both unintended pregnancy and contraceptive use. Our qualitative investigation sought to shed light on the specific influence of unintended pregnancy on future contraceptive use. Finally, the potentially higher exposure of the study population to health information and services suggests that our findings may vary in a different context.

Despite these limitations, this study provides important insights. The frequency of unintended pregnancies recorded in the study sites (about 24%) is lower than the figure reported in the 2008/09 Kenya Demographic and Health Survey for urban Kenya and Nairobi (around 29%), while the contraceptive prevalence rate in the study settings (about 48%) is comparable to the value for urban Kenya (46.6%) and Nairobi (49%) from the 2008/09 KDHS [31]. The data also reveal that about 70% of all unintended pregnancies among women with parity three or lower were mistimed, pointing to unmet need for spacing, whereas nearly 55% of all unintended pregnancies among women with parity four or higher were unwanted, suggesting a higher level of unmet need for stopping child bearing (not shown in Table 3). While the study shows that unintended pregnancy decreases with wealth, a result also observed in urban Kenya [30], it also reveals a higher prevalence in non-slums areas than in slum settings as per the bivariate results, a finding contrary to expectation, given the evidence that the slums of Nairobi are hubs of deprivation and risky health behaviors [20]. Contraceptive use on the other hand, is higher in non-slum areas, but is not significantly related to household wealth.

Importantly, the study indicates that controlling for possible confounders, women whose previous pregnancy was unintended were more likely to be using a modern method of contraception at the time of the survey. This finding is contrary to the results reported by Matteson et al. [12] and Orcutt & Cooper [13]. The interactive models – designed to illuminate the differences by SES in the size and direction of the association - reveal that among the non-poor women (middle and high wealth tertiles), a past experience of an unintended pregnancy is associated with higher use of modern contraception, while among urban-poor women (lowest wealth tertile), unintended last pregnancy is not significantly related to use of modern contraception, a finding which is likely to be explained by poor access to family planning services among the urban poor and the economic shock created by the unintended pregnancy or birth [22]. This finding suggests that in the absence of an intervention to increase the uptake of contraception, poorer women may be trapped in a vicious circle of poverty and unintended child bearing.

The qualitative investigation with women who had an unplanned pregnancy confirms some of the theoretical explanations identified in the literature. Experiencing an unintended pregnancy seems to have served as a "wake-up call", resulting in greater attention to personal risks, including increased interest in pregnancy prevention [32], making the unintended pregnancy a "lesson moment", in the sense that it provided motivation to make better reproductive health decisions [12]. Women who experienced an unplanned pregnancy feared they would not be financially able or ready to meet the costs of another pregnancy/child; others were concerned by the fact they were still living with parents or guardians, or that it was shameful to bring up a child as a single parent largely due to stigma associated with out-of-wedlock childbearing. Other respondents felt empowered to discuss family planning with their partners. To a large extent, the feeling of 'never again' was a great motivation for some women to begin thinking contraceptive use in general, or more effective methods in particular. By contrast, when factors underlying poor contraceptive use prior to the unplanned pregnancy remain unaddressed, the anticipated increased likelihood of contraception use may not be recorded [13]. For other women however, the unintended pregnancy may be a consequence of strong opposition to family planning, whether due to health concerns or other reasons. In this instance experience of an unintended pregnancy might be associated with reduced subsequent use of contraception compared to women who experienced a wanted pregnancy.

Conclusion

Kenya, as many other African countries, continues to experience high levels of unintended pregnancies, with predictable adverse consequences on fertility decline and

population growth. This study provides quantitative and qualitative evidence that women who have had an unintended pregnancy are *"ready for change"*. Family planning programs may use the contacts with antenatal, delivery and post-delivery care system as an opportunity to identify women whose pregnancy is unplanned, and target them with information and services, thereby strengthening the integration of family planning with maternal and child health services [33]. There is also urgent need for concerted effort to address the barriers that women face in accessing quality sexual and reproductive health information and services.

Abbreviations

APHRC: African Population and Health Research Center; CPR: Contraceptive Prevalence Rate; DHS: Demographic and Health Surveys; IDIs: In-Depth Interviews; KDHS: Kenya Demographic and Health Survey; MDGs: Millennium Development Goals; NUHDSS: Nairobi Urban Health and Demographic Surveillance System; RH: Reproductive Health; SES: Socio-Economic status.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

JCF and CI conceived the study; JCF carried out the quantitative analysis; CI and TS conducted the qualitative analysis; JCF and CI wrote the manuscripts with inputs from TS and RO in terms of literature review; all authors reviewed and approved the final draft of the paper.

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Article 3

4.3 Contraceptive method choice among women in slum and non-slum communities in Nairobi, Kenya

Rhoune Ochako, Chimaraoke Izugbara, Jerry Okal, Ian Askew and Marleen Temmerman

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Article 3 presents findings from a study conducted among women living in two slum and two non-slum settlements in Nairobi. The study addresses Objective 1 that seeks to get insights into the prevalence and predictors of contraceptive use among vulnerable populations. Our findings indicate that use of short-term and long-term contraceptive methods remain low among our study population. We recommend interventions that focus on disadvantaged segments of the population to increase access and thereby increase contraceptive choice and use.

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Contraceptive method choice among women in slum and non-slum communities in Nairobi, Kenya

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Abstract

Background: Understanding women's contraceptive method choices is key to enhancing family planning services provision and programming. Currently however, very little research has addressed inter and intra-regional disparities in women's contraceptive method choice. Using data from slum and non-slum contexts in Nairobi, Kenya, the current study investigates the prevalence of and factors associated with contraceptive method choice among women.

Methods: Data were from a cross-sectional quantitative study conducted among a random sample of 1,873 women (aged 15–49 years) in two non-slum and two slum settlement areas in Nairobi, Kenya. The study locations were purposively sampled by virtue of being part of the Nairobi Urban Health and Demographic Surveillance System. Bivariate and multivariate logistic regression were used to explore the association between the outcome variable, contraceptive method choice, and explanatory variables.

Results: The prevalence of contraceptive method choice was relatively similar across slum and non-slum settlements. 34.3 % of women in slum communities and 28.1 % of women in non-slum communities reported using short-term methods. Slightly more women living in the non-slum settlements reported use of long-term methods, 9.2 %, compared to 3.6 % in slum communities. Older women were less likely to use short-term methods than their younger counterparts but more likely to use long-term methods. Currently married women were more likely than never married women to use short-term and long-term methods. Compared to those with no children, women with three or more children were more likely to report using long term methods. Women working outside the home or those in formal employment also used modern methods of contraception more than those in self-employment or unemployed.

Conclusion: Use of short-term and long-term methods is generally low among women living in slum and non-slum contexts in Nairobi. Investments in increasing women's access to various contraceptive options are urgently needed to help increase contraceptive prevalence rate. Thus, interventions that focus on more disadvantaged segments of the population will accelerate contraceptive uptake and improve maternal and child health in Kenya.

Keywords: Contraceptive method choice, Contraceptive use, Slum, Non-slum, Urban poor, Nairobi, Kenya

Background

Globally, 600,000 women die annually due to pregnancy-related causes, and 75,000 die as a result of unsafe abortions with 99 % of these deaths occurring in developing countries [1–3]. Failure or lack of contraceptive services is the cause of about 200,000 of these maternal deaths. Women who have unintended births tend to suffer post-partum depression, feelings of powerlessness, increased time pressures, and a reduction in overall physical health [4, 5]. They also have poorer quality relationships with their children which potentially can lead to physical abuse and less attention [6, 7]. Often, children from large families compete for scarce family resources which likely leads to overall poor quality of life. To address some of these challenges, a study done by the Population Action International has shown that infant mortality in developing countries could be decreased by one-third by increasing the spacing between births to 2–4 years [8]. In all, effective use of contraception results in healthy

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and socially beneficial life for mothers, their children and households [9]. Moreover, it has been proven that contraceptive use prevents unintended pregnancies and abortions and facilitates family planning and spacing of births. Furthermore, effective contraception improves the social and economic role of women and enables them to participate fully in society [3]. These benefits of family planning remain central in achieving Millennium Development Goals (MDGs) target of attaining universal access to reproductive health and sustainable millennium development goals beyond 2015 [10, 11].

Contraceptive method choice is an indication of existing quality of care for women. A wide range of contraceptive options is a sign that programs can meet the diverse needs of women [12]. Availability of both short-term and long-term methods ensures that the specific needs of women who intend to limit family size, space and delay births are met and their concerns about sexually transmitted infections (STIs) and cultural acceptability of available methods is within their reach [13]. The landmark International Conference on Population and Development (ICPD) of 1994 called for greater recognition of complexities and differences in the family planning needs and preferences of couples and individuals. Hence it is imperative that both women and men have access to information and a wide range of safe and effective family planning methods that will enable them exercise freedom of choice [14]. Existing evidence indicates that restricted contraceptive choice often leads poor uptake and low contraceptive prevalence [14]. Over the years, contraceptive prevalence rates has grown exponentially in Kenya from 9.7 % in 1984 to 46 % in 2008-09 and recently to 58 % in 2014 among married women [15-17]. However, unmet need for family planning and unintended pregnancy remain persistently high, suggesting underlying barriers to effective contraception. According to the 2008–09 Kenya Demographic and Health Survey (DHS), 42 % of married women described their current pregnancy as unintended [15]. The 2014 Kenya DHS reports that unmet need for family planning is 18 % among married women [17].

Most studies around contraceptive use have primarily been informed by national demographic surveys that portray data aggregated at national or regional level thereby leaving gaps in explaining inter and intra-regional disparities [15]. For instance, increased urbanization in Kenya has led to calls for more accessible family planning services in urban areas. Although it is assumed that urban residents have better access to health services than their rural counterparts, existing evidence suggests that this might not be true given the varied living conditions found in cities. Specifically, urban residents living in informal or slum settlements face several socio-economic and health challenges. In Nairobi, it is estimated that 60 % of the population are living in slums [18, 19]. Mostly, slum settlements are characterized by high poverty levels, poor infrastructure, inadequate access to water and sanitation facilities and lack of basic amenities. Slum dwellers face other challenges such as high levels of unemployment, crime, substance abuse, poor schooling facilities and early sexual debut and low use of contraceptives which is directly or indirectly connected to unplanned childbearing [20]. Generally the use of contraceptives among the urban poor remains low [21]. Urban poor families are also often larger than their wealthier counterparts. This may suggest a lack of access to family planning for spacing and a wide range of options to limit births [22].

This study therefore seeks to understand contraceptive use and specifically the choice between no method, traditional, short-term and long-term methods among women living in slum and non-slum contexts in Nairobi. An understanding of the socio-economic and demographic drivers of women's contraceptive use can serve as efforts to improve the uptake of family planning services and interventions. It is hypothesized that women residents in slums may not have a wide range of family planning options compared to their non-slum counterparts thereby limiting their choice of short-term verses long-term methods and use of modern contraceptives in general. Specifically, the study seeks to address the following objectives: a) determine the prevalence of contraceptive method choice by characteristics of the study population; b) explore the association between contraceptive method choice; and c) identify socio-demographic, socio-economic and behavioural/attitudinal determinants of contraceptive method choice among women from slum and non-slum settlements.

Methods

Study setting

The larger study, focused on women living in two non-slum settings (Harambee and Jericho) and two slum settlements (Korogocho and Viwandani) in Nairobi, Kenya. The settlements were purposively selected by virtue of being part of the Nairobi Urban Health and Demographic Surveillance System (NUHDSS), a research platform of the African Population and Health Research Center (APHRC) [23]. All the four settlements are also recognized as distinct communities and have chiefs appointed by the government of Kenya. Though their residents are socially and economically heterogeneous, Korogocho and Viwandani are densely populated settlements occupied largely by economically disadvantaged people. The two settlements are also characterized by high unemployment and poverty levels, crime, poor sanitation and high prevalence of risky sexual behaviors and poor sexual and reproductive health outcomes, compared to Nairobi as a whole [24–26]. Health and other facilities in Korogocho and Viwandani are very poorly resourced and often lack basic essentials. Poverty also prevents a large number of people in both

settlements from accessing better quality services in the city. Viwandani is located in Nairobi East District occupying an area measuring 5.7 km^2. Viwandani has a total of 17,926 households [26, 27]. It is located within the industrial area part of Nairobi, about 7 km from Nairobi city center. The informal settlement is characterized by overcrowding, insecurity, poor housing and sanitary conditions, and inadequate social amenities [26, 28]. Korogocho is in Nairobi North District occupying an area of 0.9 km^2, located within Kasarani Division. It is situated approximately 11 km from Nairobi's central business district. The informal settlement has a total of 12,909 households [27]. Most residents operate small businesses to earn their living as wage employment is difficult to come by. The slum is characterized by high levels of insecurity, poor accessibility, inadequate housing, poor sanitation and water quality, and low access to basic services like health care and education. Jericho and Harambee, are also characterized by socio-economic diversity, but unlike the slums communities are predominantly middle-class settings, and enjoy better health, access to quality to services, and other indicators [29–31]. They were established during the pre-colonial period as predominantly African settlements. They have relatively better residential structures including accessible feeder roads, drainage and sewerage system [32].

Source of data

This paper uses data from a cross-sectional quantitative research project conducted in 2009/10 in two non-slum settings (Harambee and Jericho) and two slum settlements (Korogocho and Viwandani) in Nairobi, Kenya. While these communities are not contiguous, they, form the Nairobi Urban Health and Demographic Surveillance System (NUHDSS), a research platform of the African Population and Health Research Center (APHRC). All four settlements are also recognized as distinct communities and have chiefs appointed by the government of Kenya. Though their residents are socially and economically heterogeneous, Korogocho and Viwandani are densely populated settlements occupied largely by economically disadvantaged people. The two settlements are also characterized by high unemployment and poverty levels, crime, poor sanitation and high prevalence of risky sexual behaviors and poor sexual and reproductive health outcomes, compared to Nairobi as a whole [18, 19]. Health and other facilities in Korogocho and Viwandani are very poorly resourced and often lack basic essentials. Poverty also prevents a large number of people in both settlements from accessing better quality services in the city [20]. Jericho and Harambee are also characterized by socio-economic diversity, but unlike the slums communities studies are predominantly middle-class settings, and enjoy better health, access to quality to services, and other indicators [21–23]. The study was based on a sample of randomly-selected women aged 15–49 years, using a two-stage sampling procedure. In the first stage, 1,000 households from the two slum settlements and 1,000 households from the two non-slum settings were drawn from the NUHDSS. A second stage consisted of a random selection of one eligible woman (usual resident aged 15–49 years) in each of the sampled households [30, 31]. The sample size was based on the practice by the demographic and health surveys (DHS), which typically assume that to obtain reasonable precision for most indicators, at least 800 completed interviews of women 15–49 years are needed in each domain. Accounting for possible missing data and non-responses, the sample size was set to 1,000 per area. The questionnaire sought information on respondents' social, economic, demographic, pregnancy and birth histories (including miscarriages and abortions, stillbirths, and neonatal deaths), the intendedness of all pregnancies mentioned by the respondent irrespective of their outcomes, current use of contraception and specific methods used. A total of 1,962 women were successfully interviewed, yielding a response rate of 98.1 %. This paper analyses data from 1873 women who reported being sexually active. We exclude from our analysis, 89 women who reported that they had never had sex or were pregnant at the time of the survey.

Study variables

The question that reported current contraceptive use among women was as follows: 'Are you CURRENTLY doing anything to avoid getting pregnant?' those who responded with a '*yes*' were further asked to state the method they were currently using. The options listed included: female sterilization, male sterilization, pill, IUD (e.g., coil), injectables (e.g., Depo), implants, male condoms, female condoms, lactational amenorrhea method (LAM), rhythm method (safe days), withdrawal, emergency contraception (e.g., e-pill), diaphragm, spermicide (e.g., gel, form), and other methods not listed above for which they were required to specify. From these categories, the outcome variable, contraceptive method choice, was measured as a four outcome variable coded as: '*no method*' for women who reported not doing anything to prevent pregnancy, '*traditional method*' for women using withdrawal and the rhythm methods which are less effective in pregnancy prevention; *short-term methods* (for women who reported using female and male condoms, injectables, pills, emergency contraception); and *long-term methods* (for women who reported using female and male sterilization, implants and IUD). The dependent variable, household wealth was computed from reported household possessions, amenities and dwelling characteristics using principal component analysis and recoded into tertiles; poor, medium, and rich [33, 34]. Measurement of pregnancy wantedness

is based on questions about the desirability of recent pregnancies reported. The question asked to women was as follows *"At the time you became pregnant with (NAME), did you want to become pregnant* ***then****, did you want to wait until* ***later****, or did you* ***not want*** *to have another (more) children at all?"*, the response was classified into three categories; never pregnant, intended pregnancy (for women who reported they wanted the pregnancy at the time of conception), and unintended (for women who reported wanting no more children and wanting later the pregnancy later than at the time of conception). Employment status was defined as self-employed for those who were engaged in their own means of earning income, informal employment referred to those engaged in income that are partially or fully outside government regulation, formal employment were those under government taxation regulation while the unemployed were those not engaged in any income generating activities.

Contraceptive method choice is influenced by several factors. In this study, we hypothesize that three sets of factors, socio-demographic, socio-economic and behavioural/attitudinal factors as the major influencers of contraceptive method choice. Socio-demographic factors include age, marital status, ethnicity, parity, and household size. The level of education, wealth, type of residence and employment status are considered as socio-economic factors. Pregnancy wantedness on the other hand is considered as a behavioural/attitudinal factor. This conceptual framework makes an assumption that all these factors directly influence the choice a woman makes on the contraceptive method. Level of education is coded as none, primary and secondary/higher while wealth index is recoded as tertiles and labelled poor, middle and rich.

Methods of analysis

Using statistical software STATA version 14 for the analysis, descriptive statistics were used to provide sample characteristics. Secondly, bivariate analysis was used to assess individual relationship of each explanatory variable with contraceptive method choice while multivariate analysis was used to assess relationships controlling for other explanatory variables. The dependent variable, a four outcome variable coded as no method, traditional methods, short-term and long-term methods was fitted in a multinomial model to predict the determinants of contraceptive method choice among women living in slum and non-slum settlements. Three models were fitted, Model I assessed the determinants of contraceptive method choice while controlling for socio-demographic factors, Model II controlled for socio-economic factors while model III controlled for behavioural/attitudinal factor. The results of the regression analyses have been presented by odds ratio (OR) with 95 % confidence interval. All analyses were weighted using the svy command to account for differences in sampling probabilities.

Results

Sample characteristics

Table 1 presents results from 1873 women, 28.2 % reported use of no method, 34.2 % were using traditional methods while 31.2 % and 6.4 % were using short-term and long-term methods respectively. Majority of the women interviewed were aged 15–24 years while 43.3 % were currently married. Considering the women by their ethnic groups, Kikuyu women 33.1 %, were the majority, women who reported having 1–2 children were 38.3 % while about half of the households, 48.9 %, had between 4–6 members. Majority of the women had no education, 40.1 %, and as expected, wealth was almost equally split among the four categories. There were slightly more women living in the non-slum settlements, 50.6 %. Considering employment status, about half, 47.5 %, of the women were unemployed and another 23.6 % being self-employed. About half, 48.8 %, of the women reported that their pregnancy was intended.

Contraceptive method choice and settlement type

Figure 1 shows contraceptive method choice by type of urban residence. Reported use of no family planning was high in the slum settlements while for the non-slum settlements, use of traditional methods was slightly more than half (52.1 %) among the women. Women living in the non-slum settlements reported a slightly higher use of long-term methods, 9.2 % compared to 3.6 % among women living in the slum settlements. These results are as presented in Fig. 1.

Prevalence of contraceptive method choice among women living in slum and non-slum settlements

Table 2 shows the prevalence of contraceptive method choice in relation to selected factors including socio-demographic status, socio-economic status, and behavioural/ attitudinal among sexually active women. Considering the socio-demographic characteristics, there exists a significant positive association between age and use of traditional methods. Women over 25 years were less likely to use a traditional method as compared to using no method. Similarly, women aged 35 years and above were less likely to use a short-term method than no method, compared to younger women of aged 15–24 years. On the other hand, women aged 25 years and above were more likely to use a long-term method than use no method compared to those aged under 25 years. Currently and formerly married women were less likely ($p < 0.001$) to use a traditional method than use no method compared to their never married counterparts. On the contrary, currently married women were more likely to use a

Table 1 Sample characteristics of women 15–49 years living in slum and non-slum settlements in Nairobi, Kenya

Characteristics	Percent (%)	Number
Contraceptive method choice		
No method	28.2	528
Traditional method	34.2	641
Short-term method	31.2	584
Long-term method	6.4	120
Socio-demographic factors		
Age		
15–24	36.0	675
25–34	35.9	673
35–54	28.0	525
Marital status		
Never married	40.6	761
Currently married	43.3	811
Formerly married	16.1	301
Ethnicity		
Kikuyu	33.1	620
Luhya	18.1	339
Luo	18.7	351
Kamba	17.6	329
Other	12.5	234
Parity		
No children	31.5	590
1–2 children	38.3	718
3+ years	30.2	565
Household size		
1–3 members	24.0	448
4–6 members	48.9	915
7+ members	27.1	507
Socio-economic factors		
Education		
None	40.1	751
Primary	35.5	664
Secondary/higher	24.5	458
Wealth Index		
Poor	34.1	638
Medium	32.9	617
Rich	33.0	618
Residence		
Slum	49.4	926
Non-slum	50.6	947
Employment status		
Self-employed	23.6	441
Informal	10.8	203
Formal	18.2	340
Unemployed	47.5	889
Behavioral/attitudinal factors		
Pregnancy wantedness		
Never pregnant	31.5	590
Intended	48.8	914
Unintended	19.7	369
Total (N)	100.0	1873

short-term method than use no method compared to never married women. Both currently and formerly married women were more likely to use a long-term method than use no method compared to their never married counterparts. Considering ethnic affiliation, Luo women were more likely ($p < 0.05$) to use a traditional method than use no method compared to Kikuyu women, on the other hand, Kamba women were less likely to use a long-term method compared to Kikuyu women. Women with at least one child were less likely to report use a traditional method, but more likely to report use of a short-term or long-term method compared to those who had no children. Households with at least 4 members were more likely to report use of a traditional, short-term or long-term method compared to those with 1–3 members.

Associations with socio-economic factors show that women with secondary and higher education were more likely to use a traditional, short-term or long-term method compared to using no method than those who had no education. Women from rich households were more likely to use a traditional method than use no method compared to those from poor households. Considering type of residence, women living in non-slum settlements were more likely to use traditional, short-term or long-term methods than use no method compared to those living in the slum settlements.

Women in formal employment were more likely to use a traditional or long-term method than use no method compared to those who were self-employed. Whereas behavioural/attitudinal factor, pregnancy wantedness, shows that women with intended and unintended pregnancies were less likely to use a traditional method than use no method, these women were more likely to use a short-term or long-term method than use no method compared to their never pregnant counterparts.

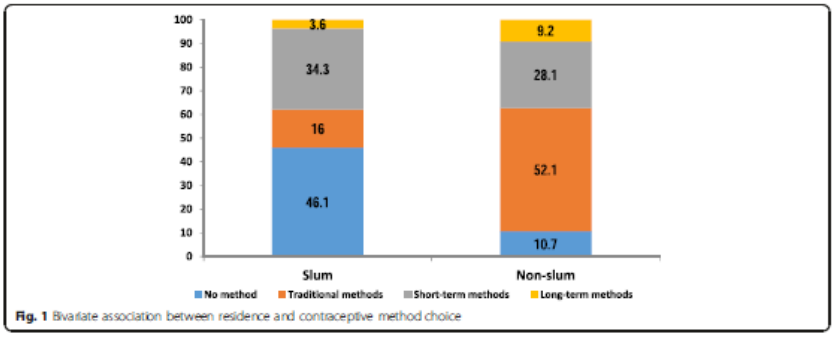

Fig. 1 Bivariate association between residence and contraceptive method choice

Determinants of contraceptive method choice among women living in slum and non-slum settlements

Multinomial regression shown on Table 3 was applied using three models to assess the effect of explanatory factors on contraceptive method choice among sexually active women living in slum and non-slum settlements. Model I controlled for the effect of socio-demographic and it shows that women aged 35 years and above were less likely to use a short-term method than use no method. The model further shows that currently married women were more likely to use a short-term or long-term method than use no method compared to their never married counterparts, both currently and formerly married women were less likely to use a traditional method than use no method compared to women who were never married. Considering ethnic affiliation, women from other ethnic groups were less likely to use a short-term method compared to their Kikuyu counterparts, similarly, women from the Kamba community and those from other ethnic communities were less likely to use a long-term method than use no method compared to Kikuyu women. Women with at least one child were more likely to use a short-term method than use no method compared to those who had no children. On the other hand, women who had 3 or more children were less likely to use a traditional method than use no method compared to those with no children. Household size was also an important determinant of contraceptive method choice where households with 4 or more being more likely to use a traditional, short-term or long-term method than use no method compared to those with 1–3 members.

In Model II we controlled for socio-economic factors and women with secondary or higher education were more likely to use a traditional, short-term or long-term method than use no method compared to those with no education. Women from rich households were less likely to report use of short-term or long-term methods compared to using no method than those from poor households. As expected, women living in the non-slum settlements were more likely to use a traditional, short-term or long-term method than use no method compared to their counterparts living in the slum settlements. Considering employment status, unemployed women were more likely to use a traditional method than use no method compared to those who were self-employed. Model III controlled for behavioural/attitudinal factor, pregnancy wantedness, where women who reported that their pregnancy was intended and unintended were less likely to use a traditional method than use no method compared to those who had never been pregnant. On the contrary, these women were more likely to report use of a short-term or long-term method than use no method compared to those who were never pregnant.

Discussion

Fewer contraceptive method choice studies make inter or intra-regional comparisons. Most studies focus on national or regional level data such as the DHS that allow contrasts at rural–urban level. The current study makes a contribution by broadening understanding of factors and determinants of contraceptive choice within an urban area while contrasting contraceptive behaviors among women living in slum and middle class non-slum settlements. Overall, the prevalence of contraceptive method choice was at 34.2 % for traditional methods, 31.2 % for short-term methods and only 6.4 % for long-term methods. 28.2 % of the women who were sexually active were not using any form of contraception. The 2008–09 Kenya DHS report use of any modern method among women aged 15–49 years as 53.6 %, additionally; use of any modern method among currently married women is reported at 53.1 % and 43.1 % for urban and rural women respectively [15]. The 2014 Kenya DHS report that the use

Table 2 Association between contraceptive method choice and various background characteritics of women aged 15–49 years

Characteristics	Traditional method vs. no method			Short-term method vs. no method			Long-term method vs. no method		
Socio-demographic factors									
Age									
15–24	1.00			1.00			1.00		
25–34	0.44	***	[0.31–0.61]	1.46	*	[1.07–2.01]	2.59	*	[1.15–5.79]
35–54	0.36	***	[0.26–0.51]	0.52	***	[0.36–0.74]	3.02	**	[1.38–6.62]
Marital status									
Never married	1.00			1.00			1.00		
Currently married	0.32	***	[0.23–0.44]	2.11	***	[1.53–2.91]	6.71	***	[2.84–15.84]
Formerly married	0.20	***	[0.13–0.31]	0.92		[0.62–1.37]	3.40	*	[1.27–9.11]
Ethnicity									
Kikuyu	1.00			1.00			1.00		
Luhya	1.43		[0.93–2.20]	1.35		[0.89–2.07]	1.18		[0.56–2.48]
Luo	1.54	*	[1.00–2.35]	1.39		[0.91–2.12]	0.64		[0.28–1.48]
Kamba	0.81		[0.54–1.21]	1.22		[0.85–1.74]	0.39	*	[0.18–0.88]
Other	1.02		[0.67–1.55]	0.78		[0.51–1.19]	0.51		[0.23–1.15]
Parity									
No children	1.00			1.00			1.00		
1–2 children	0.36	***	[0.26–0.51]	2.97	***	[2.03–4.34]	5.74	**	[1.92–17.16]
3+ years	0.20	***	[0.14–0.29]	1.72	**	[1.16–2.54]	7.63	***	[2.60–22.35]
Household size									
1–3 members	1.00			1.00			1.00		
4–6 members	1.96	***	[1.39–2.77]	1.39	*	[1.02–1.88]	3.69	***	[1.77–7.71]
7+ members	2.40	***	[1.63–3.52]	0.93		[0.64–1.35]	2.60	*	[1.11–6.05]
Socio-economic factors									
Education									
None	1.00			1.00			1.00		
Primary	2.42	***	[1.75–3.35]	1.34		[0.99–1.80]	1.23		[0.64–2.35]
Secondary/higher	11.26	***	[7.02–18.07]	3.22	***	[2.00–5.20]	9.30	***	[4.76–18.18]
Wealth index									
Poor	1.00			1.00			1.00		
Medium	1.16		[0.80–1.66]	0.88		[0.63–1.22]	0.92		[0.49–1.73]
Rich	1.44	*	[1.02–2.03]	0.83		[0.60–1.15]	0.73		[0.39–1.36]

Table 2 Association between contraceptive method choice and various background characteritics of women aged 15–49 years *(Continued)*

Residence									
Slum	1.00			1.00			1.00		
Non-slum	19.95	***	[13.59–29.29]	4.26	***	[2.89–6.28]	13.91	***	[7.90–24.51]
Employment status									
Self-employed	1.00			1.00			1.00		
Informal	1.05		[0.63–1.78]	1.01		[0.65–1.56]	0.82		[0.32–2.07]
Formal	2.54	***	[1.58–4.08]	1.23		[0.78–1.94]	2.75	**	[1.36–5.54]
Unemployed	1.99	***	[1.38–2.86]	1.03		[0.75–1.41]	0.72		[0.37–1.41]
Behavioral/attitudinal factors									
Pregnancy wantedness									
Never pregnant	1.00			1.00			1.00		
Intended	0.25	***	[0.18–0.34]	2.30	***	[1.60–3.30]	6.48	***	[2.24–18.74]
Unintended	0.41	***	[0.27–0.62]	2.49	***	[1.61–3.84]	7.87	***	[2.51–24.70]

*$p < .05$; **$p < .01$; ***$p < .001$

Table 3 Determinants of contraceptive method choice among women living in slum and non-slum settlements

Characteristics	Traditional method vs. no method			Short-term method vs. no method			Long-term method vs. no method		
Socio-demographic factors									
Age									
15–24	1.00			1.00			1.00		
25–34	0.89		[0.59–1.37]	1.05		[0.73–1.53]	1.29		[0.53–3.11]
35–54	1.05		[0.66–1.69]	0.38	***	[0.24–0.59]	1.24		[0.50–3.08]
Marital status									
Never married	1.00						1.00		
Currently married	0.56	*	[0.34–0.92]	1.65	*	[1.01–2.69]	3.46	*	[1.17–10.28]
Formerly married	0.34	***	[0.19–0.59]	0.68		[0.39–1.18]	1.56		[0.48–5.05]
Ethnicity									
Kikuyu	1.00			1.00			1.00		
Luhya	1.57		[0.99–2.50]	1.28		[0.82–2.00]	0.98		0.46–2.11]
Luo	1.50		[0.93–2.42]	1.35		[0.86–2.12]	0.55		[0.22–1.38]
Kamba	0.86		[0.55–1.34]	0.92		[0.62–1.34]	0.33	**	[0.14–0.74]
Other	0.86		[0.55–1.35]	0.60	*	[0.39–0.93]	0.39	*	[0.17–0.89]
Parity									
No children	1.00			1.00			1.00		
1–2 children	0.68		[0.43–1.09]	2.84	***	[1.64–4.89]	2.70		[0.77–9.44]
3+ years	0.35	***	[0.19–0.65]	1.96	*	[1.03–3.74]	2.40		[0.67–8.69]
Household size									
1–3 members	1.00			1.00			1.00		
4–6 members	2.21	***	[1.52–3.23]	1.40	*	[1.01–1.94]	3.09	**	[1.45–6.58]
7+ members	2.03	**	[1.31–3.16]	1.22		[0.81–1.84]	2.72	*	[1.06–6.96]
Socio–economic factors									
Education									
None	1.00			1.00			1.00		
Primary	1.67	**	[1.17–2.38]	1.26		[0.93–1.71]	1.02		[0.52–1.99]
Secondary/Higher	2.07	*	[1.09–3.92]	1.79	*	[1.00–3.20]	2.27	*	[1.11–4.63]
Wealth index									
Poor	1.00			1.00			1.00		
Medium	0.90		[0.59–1.35]	0.79		[0.57–1.11]	0.64		[0.32–1.26]
Rich	0.81		[0.54–1.20]	0.69	*	[0.49–0.97]	0.39	**	m

Table 3 Determinants of contraceptive method choice among women living in slum and non-slum settlements *(Continued)*

Residence									
Slum	1.00			1.00			1.00		
Non-slum	15.33	***	[9.55–24.62]	3.61	***	[2.31–5.62]	10.03	***	[5.64–17.82]
Employment status									
Self-employed	1.00			1.00			1.00		
Informal	1.14		[0.66–1.98]	0.98		[0.63–1.52]	0.81		[0.31–2.08]
Formal	0.95		[0.55–1.65]	0.86		[0.51–1.43]	1.22		[0.54–2.76]
Unemployed	1.59	*	[1.05–2.40]	0.95		[0.69–1.32]	0.62		[0.31–1.25]
Behavioral/attitudinal factors									
Pregnancy wantedness									
Never pregnant	1.00			1.00			1.00		
Intended	0.25	***	[0.18–0.34]	2.30	***	[1.60–3.30]	6.48	***	[2.24–18.74]
Unintended	0.41	***	[0.27–0.62]	2.49	***	[1.61–3.84]	7.87	***	[2.51–24.70]

*$p < .05$; **$p < .01$; ***$p < .001$

of modern methods increased over the last decade from 32 – 53 % [17]. Comparison with national level data show much lower use in either urban settlement type which confirms the need to understand contraceptive use between and within regions.

Our results show that women who reported having at least one child were less likely to use traditional methods but more likely to use short-term or long-term methods. Further, our results show that the likelihood to use a long-term method increased with the number of children. This is an indication of the influence of number of children ever born on the choice of contraceptive method to adopt. Elsewhere, contraceptive use has been found to increase with parity, where women who had achieved their desired family size used contraceptives to limit births [35]. Women with three or more three children were more likely to use long term methods but less likely to use traditional or short-term methods compared to those with fewer children. Number of surviving children is a key determining factor in contraceptive use. Women who achieve the desired family size are therefore more likely to use long-term methods of contraception. According to the Kenya DHS survey, the reported ideal family size was 4 children and our results are a possible indication that women are more inclined towards that family size [15, 36]. Additionally, with the decrease in child mortality, more women are likely to use long-term contraception since they do not anticipate the need to replace a child [37]. On the other hand, women who had never been pregnant were using no methods; a finding similar to those from studies in western Europe [38, 39].

Further, our results suggest that older women were less likely to use traditional and short-term methods than those under 25 years but more likely to use long-term methods. This could be a possible indication that older women want to stop childbearing and are therefore more likely to use long-term methods which are more effective as opposed to younger women who want to use contraception to space hence more likely to use reversible or short-term methods [37, 40]. Although young women are increasingly initiating sex early, they are more disadvantaged in terms on contraceptive use as they receive no sex and contraceptive education [41].

As expected, there is a greater risk to experiencing pregnancy for women in marriage which explains their higher likelihood to use either short-term or long-term methods of contraception. Currently married women were more likely to use short-term and long-term methods of contraception compared to their never/formerly married counterparts. These findings largely confirm those of studies conducted in the Philippines and the US which found contraceptive use to be common in consistent relationships [40, 42].

Considering pregnancy wantedness, women who had reported intended and unintended pregnancy were less likely to use a traditional method, but more likely to use a short-term or long-term method. The likelihood to use either short-term or long-term method was higher for women who had reported unintended pregnancy. This could be an indication that women reporting intended pregnancies were not using any contraceptives for the pregnancy reported and therefore having the child at the right time. On the other hand, women who report unintended pregnancy made reference to the difficulties while carrying an accidental pregnancy and reported seeking appropriate contraceptive method soon after delivery [43]. Women living in non-slum settlements were more likely to use traditional methods, short-term or long-term methods than their counterparts living in slum. Slum settlements in Nairobi have been reported to be hubs of deprivation and risky health behaviours [20, 34].

Women working outside the home or those in formal employment were more likely to use contraception than those in self-employment. The increased likelihood to use traditional and long-term methods is partly attributed to the cost and benefit of child bearing and rearing. As is already documented elsewhere, childbearing and rearing is incompatible with employment outside the home. Additionally, engagement in productive employment increases women's bargaining power which may result to higher contraceptive uptake [44, 45]. Women from rich households were less likely to use long-term methods. Similarly, Bangladesh women from rich households were found to be less likely to use permanent/long-term methods like sterilization for fear of the side effects or their mode of operation.

Conclusions

The findings from this study suggest low use of both short-term and long-term methods among our study population. Majority of women reported use of traditional or no method with a few using short-term methods, and even fewer using long-term methods known to be more effective in pregnancy prevention. It is a fact that long-term methods require a doctor's intervention for insertion and removal and many women may find this problematic especially when they come from resource constrained settings like slum settlements where access to such services may be problematic. Additionally, method choice is an indication of a successful family planning program. It is therefore important for the government to invest in increasing access of various contraceptive options by increasing the number of government health facilities thereby ultimately leading to increase contraceptive prevalence. More couples should be encouraged to take up contraception, and the process should include provision of a wide range of services to serve the diverse needs of these couples in the long-run. More women could benefit from additional awareness and education to dispel any myths and misconceptions around

contraceptive use thereby addressing the benefits of long-term methods of contraception and ultimately increase overall contraceptive uptake. One major limitation to this study is that these are self-reports of the study participants. This study points to the need to address barriers to access of contraceptive options to allow women to make informed decisions on the methods that will be more appropriate to them based on their needs.

Abbreviations

APHRC, african population and health research center; DHS, demographic and health survey; ICPD, international conference on population and development; LAM, lactational amenorrhea method; MDGs, millennium development goals; NUHDSS, Nairobi urban health and demographic surveillance system; OR, odds ratio; STEP UP, strengthening evidence for programming on unintended pregnancy.

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Availability of data and materials

The data used in this study can be accessed via the APHRC Microdata Portal (http://aphrc.org/catalog/microdata/index.php/catalog/70).

Authors' contributions

RO: Participated in the overall conceptualization and inception of the manuscript idea, with lead roles in conducting literature review, data analysis, writing the results and discussion sections. CI: was the study PI, assisted in conceptualization of the manuscript, and provided overall guidance in writing different sections of the manuscript. JO: assisted in writing the discussion as well as overall review. IA: provided guidance during data analysis and interpretation as well as overall review of the manuscript and MT: provided overall guidance in analysis and review of the manuscript with particular attention on how it adds to the body of literature in Kenya. All the authors read and approved the final manuscript.

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Competing interests

The authors declare that they do not have any competing interests in this study.

Consent for publication

Not applicable.

Ethics approval and consent to participate

Ethical approval was obtained from the Kenya Medical Research Institute, and written informed consent was obtained from study participants before the interviews. As per ethical regulations that govern research involving participants who are considered as minors, consent was sought from parents/guardians of all participants aged below 18 years, the age of majority in Kenya, before their participation in the study. Women in need of information or services were referred to appropriate facilities and organizations according to the protocols in place in the NUHDSS.

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Article 4

4.4 Experiences of Female Sex Workers Using Contraceptive Methods: a qualitative study in Kenya

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Article 4 presents a study among female sex workers (FSW) and addresses both Objective 1 and 2 by considering both predictors and barriers to contraceptive use among vulnerable populations. Our findings reveal that while some FSWs know about modern contraceptives, others have no idea or altogether refuse to use contraceptives for fear of losing clients. Their interactions with different client types also act as a barrier but sometimes provide opportunities for contraceptive use among some FSWs. We recommend delivery of contraceptives to FSWs via a multi-sectoral approach involving community based distribution. We also recommend the introduction of targeted counseling services to provide information on the benefits of non-barrier contraceptive methods with additional support services to manage side effects arising from their use to encourage uptake and dual use of contraceptives for both pregnancy and STI/HIV prevention.

Female Sex Workers Experiences of Using Contraceptive Methods: A qualitative study in Kenya

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ABSTRACT

Background: Female Sex Workers (FSWs) are predisposed to a broad range of social, sexual and reproductive health problems such as sexually transmitted infections (STIs)/HIV, unintended pregnancy, violence, sexual exploitation, stigma and discrimination. Female sex workers have unmet need for contraceptives and require comprehensive Sexual and Reproductive Health (SRH) prevention interventions. Existing programs pay little attention to the broad sexual and reproductive health and rights of these women and often focus on HIV and other STIs prevention, care and treatment while neglecting their reproductive health needs, including access to family planning methods. The aim of this study is, therefore, to explore the experiences of female sex workers with using existing contraceptive methods, assess individual and health facility-level barriers and document inter-partner relationship in the use of contraceptives.

Methods: We focus on women aged 15-49, who reported current sex work, defined as 'providing sexual services in exchange for money or other material compensation as part of an individual's livelihood.'

Results: Findings reveal that while some FSWs know about modern contraceptives, others have no idea or out rightly refuse to use contraceptives for fear of losing clients. The interaction with different client types act as a barrier but also provide an opportunity for contraceptive use among FSW. Most FSW acknowledges the importance of dual protection for HIV/STI and pregnancy prevention. However, myths and misconceptions, fear of being tested for HIV at the family planning clinics and wait times and long queues at the clinics all act in combination to hinder uptake of contraceptive use.

Conclusions: We recommend a targeted approach to address the contraceptive needs of FSW to help remove barriers to contraceptive uptake. We also support the introduction of counseling services to provide information on the benefits of non-barrier contraceptive methods and thereby enhance dual use for both pregnancy and STI/HIV prevention.

Keywords: FSWs, Condom use, Pregnancy prevention, Contraception, Kenya

BACKGROUND

Female Sex Workers (FSWs) are predisposed to a broad range of social, sexual and reproductive health problems such as sexually transmitted infections (STIs) including HIV/AIDS, unintended pregnancy, exploitation, stigma and discrimination, and violence [93, 135, 136]. All these vulnerabilities, coupled with women's low status, repeated human rights violations, poor educational or economic opportunities and poor attitudes towards sex and sexuality predispose women, and particularly FSWs, to a host of other STI risk factors [137-139]. The realization that key population groups such as sex workers are at increased risk of STIs led to the implementation of STI control widely adopted as a strategy to mitigate untoward effects of STIs/HIV [140]. Therefore, public health interventions targeting FSWs are designed to prevent STIs/HIV through correct and consistent condom use [140, 141]. Despite this, data suggests that unprotected sex and pregnancy are common among FSWs [142]. Additionally, the strategies targeting female sex workers remain ineffective by only targeting FSW and failing to target their clients who are likely to be the decision makers in their sexual relations [143]. Evidence indicates that correct and consistent condom use may be complicated by the lack of autonomy to insist on condom use especially with steady and emotional partners, or through coercion by other clients who refuse to use condoms by promising to pay more or using violence [91, 96].

Female sex workers need access to comprehensive Sexual and Reproductive Health (SRH) prevention measures [94]. Existing programs pay little attention to the broader sexual and reproductive

health and rights of these women and often focus on HIV and other STIs prevention, care and treatment while neglecting the reproductive health needs, including access to a full range of family planning methods [91, 92]. Also, these interventions have not fully embraced FSW specific needs like they have done to the rest of the women in the general population [93, 94]. Further, the challenges are augmented by discriminatory community values and norms, availability and access to the contraceptive methods suitable for FSW [144]. This is mainly due to obstructive factors such as long waiting time, inconvenient waiting hours, fees, and perceived HIV testing among other factors [94]. Unlike women in the general population, FSWs are prone to higher maternal morbidity and mortality risks because of exposure to risk factors associated with HIV-related mortality and unsafe abortions related deaths [95]. A study conducted in sub-Saharan Africa established that women who are engaged in commercial sex are at high risk of physical and sexual violence, unwanted pregnancy, and STIs [93]. The risk of violence further predisposes them to other social and health problems that hinder their access to SRH services which is a fundamental human right [145]. There are limited studies that have reported pregnancy desires and contraceptive use among FSWs, particularly in Kenya [91]. The available research, however, demonstrates that FSWs often want to avoid future pregnancies, despite higher rates of unplanned pregnancies and abortions compared to women in the general population [146, 147]. Although this is the case, they continue facing challenges in initiating and sustaining the use of more efficient contraceptive methods [91, 94, 148].

Access to contraception and reproductive health services remains a significant challenge for many sex workers. Studies suggest that many sex workers who did not want to become pregnant were not accessing a reliable contraceptive method often due to discrimination and fear, unfriendly health facility staff, and opening and closing time of services [149]. It is also worth noting that to a large extent, contraceptive uptake depends on individual perceptions, experiences, and ease of use [150]. Dual method approach is reported among female sex workers mainly to help prevent unwanted pregnancy and diseases like STI/HIV. Additionally, the dual method acts as a backup should a condom burst during sexual intercourse [141, 142]. The aim of this study is, therefore, to explore the experiences of female sex workers with existing contraceptive methods while also considering the influence of clients who may act as barriers or provide opportunities for contraceptive use. It is anticipated that these findings will inform future interventions and access to services among FSW and other key populations.

METHODS

The study was conducted from June to December 2008, within two districts - Naivasha and Changamwe – of Kenya's former Rift Valley and Coast Provinces, respectively. These urban to semi-urban districts are known for having a concentrated FSW population, in part due to the port and tourist trade in the Coastal region in which Changamwe is part of, and to truck drivers, transport and seasonal workers in flower farms in Naivasha [91]. The locations are about 500 km apart; Naivasha is a vibrant town with a large migrant worker population

attracted by its flower, transport and other industry. Other than being the second largest city in Kenya, Mombasa is a port city, trading center and popular tourist destination [134]. These two locations have long-running HIV and STI prevention programs for FSWs. These programs are run by various organizations providing targeted HIV and SRH services.

Women who reported current sex work, defined as 'providing sexual services in exchange for money or other material compensation as part of an individual's livelihood,' and were 15-49 years were eligible for study participation. FSW were recruited through local sex workers trained as HIV/AIDS peer educators and through snowball sampling [91, 134]. A total of eight Focus Group Discussions (FGDs) involved 10-12 participants (total 81). Participating women were grouped by similar age, site of recruitment and type of sex worker (full or part time) to enhance open discussion and reduce inhibitions among participants. The FGD guide addressed issues around FSWs health problems, work, health awareness of HIV, dynamics of their relationships with clients and contraceptive use.

The FGDs were conducted in the national language, Swahili, by a trained duo of a focus group moderator and a note taker. The same focus group research pair conducted all focus groups in both study sites to enhance consistency. FGDs were digitally recorded, uploaded to a laptop computer, transcribed verbatim, and translated from Swahili to English by the moderator and note taker. Transcriptions and translations were reviewed for quality by the interview team. The analysis team performed qualitative analyses with NVivo v. 7.0 (QSR

International Pty Ltd) qualitative data analysis software. A content-driven theme approach was used for analytic review of the FGD data. Transcripts were read and re-read to identify recurrent themes and to develop a coding tree. Once all the transcripts were coded, memos and display matrices were developed to examine each code in detail for sub-themes, nuances, and patterns across the interviews [91, 134].

All FGDs took place at a neutral, confidential location secured by the research team in the study sites. Cash compensation at a standard flat rate of Kshs 300 (approximately USD $4.29 at the time of data collection) was provided to all study participants upon arrival at the FGD site. This compensation was provided to reimburse participants' transportation costs to the FGD site, and was approved by two institutional review boards, the Family Health International's Protection of Human Rights Committee and the Kenyatta National Hospital Ethical Review Committee. At the close of the FGD, all participants received information on readily available service delivery points for Family Planning (FP) and HIV Counselling and Testing services [91, 134].

Ethical Considerations

Permission to conduct this study was obtained from Family Health International's Protection of Human Subjects Committee (USA), the Kenyatta National Hospital/University of Nairobi - Ethical Review Committee (Kenya), and the National Council for Science and Technology (Government of Kenya) approved the study protocol. As per ethical regulations that govern research involving participants who are considered as minors, consent was sought from parents/guardians

of all participants aged below 18 years, the age of majority in Kenya, before their participation in the study. Verbal consent was provided by the study participants, and no identifying information was connected with the interviews or retained following the completion of the analysis.

RESULTS

Contraceptive knowledge

Contraceptive use relates to knowledge, attitudes, perceptions, and practice of contraceptive methods and pregnancy prevention for FSW. In the narratives, some women said that they use contraceptives to protect themselves from pregnancy simply because they already have children. On the other hand, some FSWs had little or lacked idea on contraceptives. Either, this was due to ignorance or lack of information on where to access services. Whereas, there are those that lack time to go for services at the family planning clinic. Therefore, because lack of contraceptive use by some women has led to some women. having five to six pregnancies before seeking family planning services.

> *R2 if she practices family planning, her health together with that of her children will be good.*

> *R3 it is important for Sigalame (FSW) to go to an FP clinic to get her womb tied (tubal ligation), get pill or injection because this will even prevent her from getting pregnant by her regular client, whom she could even suggest to going for VCT and know their HIV status. I think that if she went for family planning, it would be good for her.*

R2 I want to clarify the point, the truth is that most FSW's do not like family planning" I was talking about myself then, now we are discussing Kunga (FSW). I do not use condoms or any other family planning method, they are history for me. When will I feel the pleasure of sex!

Opportunities and barriers to contraceptive use with different client types

Female sex workers provided their insights and experiences of contraceptive use by different client types. The narratives present opportunities and barriers to contraceptive use with casual clients, regular clients, and boyfriends or emotional partners.

Casual clients

Casual clients are one time or unfamiliar men who pay cash or other resources in exchange for sexual services. As strangers whose main aim is sexual pleasure and gratification, they do not have an emotional attachment with sex workers. Pregnancy prevention discussion for the women depend on different circumstances. By and large, casual clients are more interested in sex and do not care whether the sex worker becomes pregnant or not. Some casual clients use condoms to protect themselves against HIV and other STIs while some refuse to use condoms and may occasionally become aggressive when asked to use condoms. On other occasions when the FSW insist on condom use, the paying client may decide to reduce pay because they believe that condoms reduce sexual pleasure.

R2 Sigalame (FSW) should also be careful; there are men who simply tear the condom. The man does not want to speak about it because he knows very well that you are going to refuse his suggestion, so he wants to do things that you are unaware of.

Regular clients

Some relationships with the FSW progress from casual clients to more stable/trusted partnership because of familiarity and trust developed over time. Typically, in these type of relationships, an in-kind payment such as entertainment, child care or tours are a fairly common medium of exchange for sex. The clients and sex workers communicate frequently and may agree on visits to the sex worker's home for sex or meet up at an agreed lodging area. Depending on the level of trust between them, the regular client may choose to wear a condom or not during sex. Overall, pregnancy prevention remains a priority and key consideration to the FSW health, wellbeing, and livelihood. Avoiding pregnancy gives the woman the opportunity to continue with her work and take care of her family and children.

> *R3 it is important for Sigalame (FSW) to go to an FP clinic to get her womb tied (tubal ligation), get pill or injection because this will even prevent her from getting pregnant by her regular client, whom she could even suggest to going for VCT and know their HIV status. I think that if she went for family planning, it would be good for her.*

Boyfriend or emotional partner

The boyfriend or the emotional partner can either be a live-in partner or not. This type of partner may be a client who has moved from being a casual client to a regular client and over time has developed a strong emotional attachment with the FSW. Some of these relationships are built out of the children born from the relationship. Sometimes, the boyfriend/emotional partner is aware of the kind of work the FSW is involved in and choose to accept the situation. Even with the ongoing concurrent relationships, FSWs continue with sex work, as usual, to

provide for her needs and that of the household owing to varied financial needs for her family.

> *R7 but even with an emotional partner who depends on you for upkeep, you will still have to go out and do sex work. There is no way you can tell your children that you do not have money to take care of them because you did not go to work, that you were counting days. An FSW is at work every day.*

Sometimes the unemployed boyfriend/emotional partner will encourage FSW to go out for sex work forhousehold sustenance. Even though the boyfriend/emotional partner knows that the FSW is involved in sex work, this does not bother him as long as she gets the money.

R3 He knows she is leaving the house to go for sex work

In the existing relationship with the emotional partner, the burden of taking care of children is solely on the FSW because the boyfriend may not want to take up responsibility. For the emotional client, the FSW does not necessarily use a condom when having sex but may opt for other contraceptive methods based on her need.

> *R8 even though she has different clients, there is one particular one she refers to as hers; and this one would not be using a condom all the time.*

With the emotional partner, the FSW does not use condoms. She might opt to use other methods such as the injectable or Calendar as a family planning method. The FSW probably knows the HIV status of the live-in boyfriend or trusts him out of the time they have known one another, so they do not see the need to use condoms. Should the

FSW want to prevent pregnancy with her live-in-partner, she might opt to use a female condom if they are available.

R7 She does not use any protection, but because she does not want to get pregnant and the man she is living in with wants her to, "how do I succeed in making this one pregnant?" it would force her to use her own condom to prevent pregnancy.

R4 it is very easy to manage an emotional partner and you cannot have sex with him every day anyway. If your period is very regular and are not using a condom with him it is easy to prevent pregnancy if you discuss it, he cannot refuse (leaning backwards, legs outstretched)

R3 our Sigalame (FSW) likes to count days if she has a boyfriend in the house, so she will count up to the date when she knows that if she had sex on that day, she would not get pregnant.

Dual protection

The use of other contraceptive methods such as the injectable in addition to condoms was highly recommended by women to offer dual protection against pregnancy and STIs. To most women, the injectable would come in handy to prevent unwanted pregnancy when a condom broke or the client intentionally tear them. Similarly, the use of pills was approved for the same reason as injectable.

R2 she will use a condom to prevent infections, but the injection would be to prevent pregnancy because of instances where the condom breaks, or a client who is cleverer and tears it

R4 (trying to remember) she had said that (pointing at R2) she should just use the injection and not the condom; but I am saying that whether one uses injection or pills, it is a must to use the condom because it prevents infections unless it broke or was torn by a client

The female condom was also reported to be good for protection from HIV and pregnancy especially because some clients are reluctant to use condoms. FSW will most certainly use the female condom if they have self-awareness and are concerned about their health or don't want more children.

> *R3 she will wear it before even going out there to look for clients' maybe more than six hours earlier; if she gets one who does not want to use protection, she will be able to accept because she already has her own and this man will not know that.*

Other barriers to contraceptive use

It is advisable that FSWs use condoms correctly and consistently for STI/HIV prevention in addition to other more effective non-barrier contraceptive methods for pregnancy prevention. However, this may be a challenge to some FSWs given the challenges they report with non-barrier contraceptive methods. For instance, some FSW report side effects of contraceptives which they say interfere with their engagement in sex trade. In particular, injectables were reported to be bad for business as they caused dizziness, nausea and continuous bleeding.

> *R7 There are also those who bleed all the time because of the injection. Once you start having sex, you bleed.*

> *R2 Injection. Some bleed so much when they are on the injection. Or even when you are having sex, you find that you have been bleeding. That will also make clients run away from you.*

Considering the pill, most FSW reported that this method was not popular with them because of the risk of forgetting to take the pill and

they may be forced to take more pills to account for days missed which may ultimately pose health risks.

> *R5Even that family planning, let's take for example the pill, Kunga (FSW) will not even have the time to take them, or she will simply forget to take them. Maybe she buys them every day and has a variety of packets in the house and does not even know which one to take.*

The challenges with an intrauterine device (IUD) or coil are related to the client feeling discomfort during sex and hence interfere with their business. These challenges coupled with the need to use a method that offers protection from STIs/HIV and unwanted pregnancy may result in condom use among the FSWs.

> *P3 she does not want to use the coil because who may feel it during sex and wonder what it could be*

On the contrary, use of the coil was not recommended by most women simply because of fear that it can come out during sex and may require a medical procedure to insert. FSW have sex with many partners most of whom have different expectations and desire for sex.

> *R3 Sigalame (FSW) cannot use a coil*
> *R2 because she 'meets' (has sex) with many people*
> *R3 it will come out very fast and may even need an operation for it to be removed. So, anyone who does not have a husband…*
> *R8 is not advisable to use the coil*

Health facility-level barriers

Health facility-level barriers like having a mandatory HIV test may prevent access to contraceptives. There is fear of being tested for HIV when one visits a family planning clinic. Some FSWs reported that they are forced to take an HIV test at the clinic, and therefore prefer private outlets such as pharmacies to get contraceptives or they may decide to go without using any contraceptive methods.

> *R7 but some fear the injection because nowadays they are forced to test for HIV if you want to get the FP injection; and that is why when Sigalame (FSW) is tested and found to be HIV negative, she gets saved (salvation).*

There is a perception that family planning will make one not to be 'sweet' enough during sex, consequently, she will lose clients.

> *R2 Because family planning will spoil her 'goods' {sex] (pointing at herself)"*
> *"R6 Once they have seen it is [sex] not good, they will not come back.*

Wait time and time spent at the health facility when accessing family planning services present an enormous challenge to some FSW. Some FSW narrated that they risk losing clients coming to a designated place when they are away at the family planning clinic. Moreover, as they explained there is stiff competition for clients, and they would not want to be left out in the search for new clients. Thus, to ward of competition from their peers, some FSW do not use contraception to attract more customers.

> *R6 Kunga (FSW) lives in a guest house. We said, for example, she lives*

in Mwangeka guest house, and there are others living in the same guest house who are competing for the same clients. Maybe Kunga (FSW) wants to use protection; the others are fast 'bamba fifty' [cheap and do not use protection] and keep on getting clients. Kunga (FSW) will definitely stop thinking about contraception and follow suit.

DISCUSSION

This study makes a contribution by highlighting the experiences of female sex workers with contraceptives. We note that while some FSW know that contraceptives were useful for pregnancy prevention, general knowledge remained poor with some resorting to abortion to terminate an unwanted pregnancy. Elsewhere, a study in China conducted among adolescent FSW also found general sexual and reproductive health knowledge to be low, and while 98% reported not wanting the pregnancy, less than half (43%) reported consistent condom use with another 28% reporting current use of another contraceptive method [151]. A separate study examining contraceptive use among female entertainment sex workers in Cambodia found several factors to be linked to induced abortion such as the increase in a number of clients, inconsistent condom use, condom breakage and forced unprotected sex [152]. Elsewhere, induced abortion was more common among older married women who additionally had lower contraceptive knowledge [153].

The study also highlights the vulnerability of FSWs to unintended pregnancy or worse HIV/AIDS among those who have to balance between their livelihoods and pregnancy prevention with different types of sexual partners. In examining these FSWs' contraceptive needs, it was clearly evident that on a daily basis these women were

exposed to difficult situations that can have far-reaching implications on their overall health and well-being. In our analysis, we found that typically clients do not care much about contraceptive use – regardless of the partner type – most clients care less about using different contraceptive methods. Further, condom use for HIV/AIDS prevention was also difficult as some clients offer to pay more money to have unprotected sex while others turned violent against the women. This behavior by clients brings a lot of confusion to women. On the one hand, they have to make a difficult decision on whether or not to use condoms when enticed with a lot of money and on the other hand they are continually exposed to the danger for proposing condom use to the clients. Nevertheless, it was common for women to describe pregnancies that occurred during sex work - commonly unintended.

Participants' accounts of their contraceptive use (or non-use) with clients, also highlight the substantial diversity in women's relationships with their clients. Whereas it was apparent that FSWs found it substantially difficult to discuss contraceptive use with casual clients, it appeared, however, that in ongoing relationships with regular clients, including boyfriend, lover, and emotional partner, there was consensus to use or not use contraceptives. Likewise, the extent to which women proposed contraceptive use to their clients or other sex partners varied dramatically by partner type. Women spoke about how their desire to use contraceptives with casual clients was in most cases dismissed by these clients whose interest is mainly sexual pleasure, and who sometimes forced them to have sex without any form of protection, from STIs/HIV. Although most women were open

about discussing contraceptive use with their more familiar partners, most women revealed that most men deserted them when they learned that they were pregnant. For several women, getting pregnant and having children was a woman's responsibility.

When participants described contraceptive use or pregnancy prevention, in most cases, the women either faced barriers to discussing contraceptive use with their partners or they had not used contraception consistently. Although most women seemed aware of the need to prevent pregnancy and were aware of other contraceptive methods, they clearly had difficulties on using them effectively with the different partner types due to violence; the lure of money; fear of losing them to their colleagues; or limited communication with their partners. Previous studies elsewhere in Sub-Saharan Africa demonstrate that interventions that sensitized male partners led to a significant increase in couple communication and a consequent increase in contraceptive use among couples [154]. Programs and providers that offer family planning services should, therefore, ensure that FSWs are empowered to use contraceptive methods, have access to contraception and that male partner are sensitized on the importance of contraception.

Consistent with previous studies among FSWs, inconsistent condom use was very common among participants. Compared to FSWs in similar settings as Kenya, women in our study face multiple barriers in ensuring that they have protected sex by having their clients use condoms [5]. Based on their accounts, most participants wished to use condoms with casual clients, however, convincing their clients to

use condoms was not always easy. Although there was a notable concern from the women of fear of being infected with HIV or other STIs, some of the clients seemed not to share these concerns. Most of these clients ultimately force or lure the women to have unprotected sex.

Most of the time, sex with the emotional partner or boyfriend was without condom use as many FSWs reported a preference for the injection or calendar method with these partners. Similar findings have also been reported in a study conducted in Nyanza where FSWs reported unprotected sex with their regular or romantic partners. Female sex workers interviewed in Kibera in Nairobi also reported not using condoms with their intimate partners as this was a sign of intimacy and trust [155]. Overall, despite reported use of other contraceptive methods, there was over-reliance on condoms which offer dual protection.

Dual protection was an important tool for prevention of unwanted pregnancy and STIs/HIV. Some FSW reported using condoms and other forms of contraceptives such as injectables and pills to offer dual protection. While condoms are effective at preventing STIs/HIV, they may not be very effective at preventing unwanted pregnancy. On the other hand, non-barrier contraceptive methods do not offer protection against STIs/HIV hence the need to use both to offer dual protection [141]. Fear of condom breaking was also reported as a motivation for dual protection to offer protection against unwanted pregnancy. On the other hand, it was worth noting that dual protection was not common with the emotional partner or boyfriend

with whom the FSW reported to use either the calendar method or injectables and their relationship is based on trust. Elsewhere, use of non-barrier methods and condoms was found to be less among FSWs and their non-commercial, often more intimate partners [141]. Additionally, a study in Gulu, northern Uganda reported low dual contraceptive use as a result of police presence which led to rushed negotiations with clients thereby increasing the FSW risk to STIs/HIV and unwanted pregnancy [156]. The use of female condoms was also reported to offer protection, especially with clients who refused to use the male condom. This was mainly used by FSW who were concerned about STIs/HIV and unwanted pregnancy. The female condom has been found to offer dual protection from both STIs/HIV and unplanned pregnancy; it also acts as a tool for women's empowerment [157].

Reported barriers to contraceptive uptake among FSW include side effects which interfere with their business of sex trade include continuous bleeding, dizziness, and nausea for the injectables. Other barriers were those related to access to the services which included fear of getting tested for HIV whenever they visited family planning clinics, competition in clinic time and time for clients, among other barriers. To increase family planning uptake among FSW in Cambodia, the government and NGOs provide free and friendly sexual and reproductive health services, despite this, some FSW still reported barriers such as discrimination by providers thereby making them resort to using of private providers [152].

CONCLUSION

Program implementers should consider working with providers to minimize barriers as FSWs face substantial barriers to making decisions around contraceptive access and use. There are also myths and misconceptions among FSWs around family planning use which sometimes they say will spoil her 'goods' and eventually make them lose clients. We, therefore, recommend the introduction of counseling services to provide information on the benefits of non-barrier contraceptive methods and additional support services to manage side effects arising from their use. Moreover, more family planning distribution points within the community especially those targeting priority groups such as sex workers will help increase access and ultimately increase contraceptive uptake among FSWs.

List of abbreviations

FSW, Female Sex Workers; STIs, Sexually Transmitted Infections; SRH, Sexual and Reproductive Health; FGD, Focus Group Discussions; HIV/AIDS, Human Immunodeficiency Virus/ Acquired Immuno-Deficiency Syndrome, FP, Family Planning; NGOs, Non-Governmental Organizations; IUD, Intrauterine Device; WHO, World Health Organization; VCT, Voluntary Counseling and Testing; HIV, Human Immunodeficiency Virus; STIs/HIV, Sexually Transmitted Infections/ Human Immunodeficiency Virus; FHI, Family Health International; USAID, US Agency for International Development.

DECLARATIONS

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Availability of data and materials

Request for data should be directed to the lead author, Rhoune Ochako: rochako@gmail.com.

Competing interests

The authors declare that they do not have any competing interests in this study.

Ethics approval and consent to participate

Permission to conduct this study was obtained from Family Health International's Protection of Human Subjects Committee (USA), the Kenyatta National Hospital/University of Nairobi - Ethical Review Committee (Kenya), and the National Council for Science and Technology (Government of Kenya) approved the study protocol. As per ethical regulations that govern research involving participants who are considered as minors, consent was sought from parents/guardians of all participants aged below 18 years, the age of majority in Kenya, before their participation in the study. Verbal consent was provided

by the study participants, and no identifying information was connected with the interviews or retained following the completion of the analysis.

Consent to publish

Not applicable.

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Author's contributions

RO: Participated in the overall conceptualization and inception of the manuscript idea, with lead roles in conducting the literature review, data analysis, writing the results and discussion sections. JO: was the study co-PI and also assisted in the conceptualization of the idea of this manuscript and provided overall guidance and writing of the methodology, results and conclusion sections of the manuscript. SK: assisted in writing the background section as well as overall review, IA: provided guidance during data analysis and interpretation as well as overall review of the manuscript and MT: assisted in conceptualization and provided overall guidance in analysis and review of the manuscript with particular attention on how it adds to the body of literature in Kenya. All the authors read and approved the final manuscript.

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Article 5

4.5 Modern Contraceptive use among migrant and non-migrant women in Kenya

Rhoune Ochako, Ian Askew, Jerry Okal, John Oucho and Marleen Temmerman

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This paper presents findings from the analysis of the KDHS with a focus on the influence of migration on contraceptive use. Our findings state that migration has a positive influence on contraceptive use among women moving from rural-urban and urban-urban. This finding provides an opportunity for program implementers to explore and provide programmes that meet the needs of women who migrate to take advantage of the benefits of migration in the lives of these women.

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Modern contraceptive use among migrant and non-migrant women in Kenya

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Abstract

Background: Manifest socio-economic differences are a trigger for internal migration in many sub-Saharan settings including Kenya. An interplay of the social, political and economic factors often lead to internal migration. Internal migration potentially has significant consequences on an individual's economic growth and on access to health services, however, there has been little research on these dynamics. In Kenya, where regional differentials in population growth and poverty reduction continue to be priorities in the post MDG development agenda, understanding the relationships between contraceptive use and internal migration is highly relevant.

Methods: Using data from the 2008–09 Kenya Demographic and Health Survey (DHS), we analyze data from 5,905 women aged 15–49 years who reported being sexually active in the last 12 months prior to the survey. Bivariate and multivariate logistic regressions are fitted to predict correlates of contraceptive use in the presence of migration streams among other explanatory variables.

Results: Modern contraceptive use was significantly higher among women in all migration streams (non-migrant urban (OR = 2.8, $p < 0.001$), urban-urban (OR = 2.0, $p < 0.001$), urban-rural (OR = 2.0, $p < 0.001$), rural-urban (OR = 2.6, $p < 0.001$), rural-rural (OR = 1.7, $p < 0.001$), than non-migrant rural women.

Conclusion: Women who internally migrate within Kenya, whether from rural to urban or between urban centres, were more likely to use modern contraception than non-migrant rural women. This phenomenon appears to be due to selection, adaption and disruption effects which are likely to promote use of modern contraceptives. Programmatically, the differentials in modern contraceptive use by the different migration streams should be considered when designing family planning programmes among migrant and non-migrant women.

Keywords: Kenya, Migration, Migration streams, Modern contraceptive use

Background

Internal migration plays an important role in explaining the population dynamics which consequently influence the population structure and distribution [1, 2]. Despite this important role, internal migration receives low priority by policy makers and governments in Kenya and other sub-Saharan African countries, in part due to knowledge gaps on the extent, nature and magnitude of internal migration and its nexus to health and overall well-being [2]. When people migrate, they interact with new social, cultural and economic contexts which potentially change their way of thinking and behavior to resemble that of the host community. While rural-rural migration remains the most predominant form of migration in Kenya, it is rural-urban migration that potentially brings change in the lives of migrants by offering knowledge, socio-economic opportunities and overall improved living standards [3].

In the recent past, there has been a shift from focusing on movement patterns for males to feminization of migration and the occurrence of other forms of migration streams [4]. The current attention on female migration and its associated health outcomes call for a particular understanding of the sexual and reproductive health needs of migrant females [4–7]. Contraceptive use among migrants therefore remains of interest to demographers, population scientists and policy makers due to its influence on fertility, sexual and reproductive health

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and the implications for provision of appropriate services [7, 8].

Migration can be a life changing event with profound consequences for sexual and reproductive health [9]. Migration from rural to urban areas is likely to increase access to contraception thereby increasing knowledge and uptake of sexual and reproductive health services [10]. Existing studies have shown that rural-urban migrants have lower fertility than non-migrants remaining in rural areas but have higher fertility than non-migrant urban residents [11–13]. According to the 2008–09 Kenya Demographic Health Survey (KDHS), married women in urban areas were more likely to use a contraceptive (53 %) than their rural counterparts (43 %). Additionally, the use of modern methods was generally higher in urban (47 %) than in rural areas (37 %) [14]. Total fertility rate also dropped from 4.9 children per women to 4.6 children per woman between 2003 and 2008–09 respectively. This decline was observed more among women in urban areas where there was a decline from 3.3 to 2.9 children per woman compared to a drop from 5.4 to 5.2 children per woman during the same period for rural women [14].

Theoretical framework

In demographic literature, three theories: selection, adaptation and disruption, are used to explain the causes of differentials between migrant and non-migrant women which in turn may explain the changes in their observed behaviour [15, 16]. The selection theory explains migrants as a self-selected group with characteristics different from non-migrants in rural areas due to their higher levels of education, later age at marriage, lower premigration fertility and participation in gainful employment [17]. These factors have been shown to have an effect before and after a migration event. The disruption theory, on the other hand, suggests that migration leads to physical separation of sexual partners which in turn helps postpone or space child bearing. The adaptation theory proposes that socio-cultural norms in the migration destination will influence those moving from rural to urban areas. It is worth noting that these theories do not act in isolation given the dynamic relationship between them, hence the need to identify the effects of each to understand their implications on modern contraceptive use [18].

The Kenya Demographic and Health Survey (KDHS), conducted every five years since 1989 and the nationwide census have consistently provided comparable data on contraceptive use and consequently fertility changes. In the late 1980's the country began a fertility transition; fertility decline was observed across all age groups and mainly attributed to improvements in child survival and use of modern contraceptives which helped achieve smaller desired family sizes [19]. For instance, use of modern contraceptives increased from 5.9 % (Kenya Fertility Survey) in 1970s to 31.5 % in 1998 (KDHS 1998). Additionally, the proportion of married women reporting no desire for more children increased from 17 to 53 % in the same period. The fertility transition witnessed in the 1980s and 1990s stalled and reversed from 2000 onwards. The stall was attributed to an increase in child mortality due to HIV and AIDS and shortages in contraceptives following diversion of resources from family planning programs to HIV prevention [20].

This paper focuses on the 2008–09 Kenya DHS as it involves data collected after these changes, including the stall in fertility decline witnessed in Kenya. We seek to explore modern contraceptive use among migrant and non-migrant women through bivariate and multivariate logistic models. We seek to answer the question of whether change in residential status has an influence on modern contraceptive use. Findings from this paper will be shared with the stakeholders working on programmes that seek to influence contraceptive use specifically among populations in mobility.

Methods

Source of data

This paper uses data from the 2008–09 Kenya Demographic and Health Survey (DHS) which is a nationally representative survey of women aged 15–49 years. From the 9,057 households interviewed, 8,767 women were found to be eligible and 8,444 were interviewed, giving a response rate of 96 %. The data were weighted to adjust for differences in probability of selection and non-response. As of March 2015, this was the latest survey data available for Kenya. This analysis is restricted to the 5,905 (weighted) women who reported being sexually active in the last 12 months prior to the survey; we excluded from this analysis any woman who reported they were pregnant at the time of the survey, regardless of the pregnancy duration and any woman who reported that they were infecund or sterile as they were not exposed to the risk of pregnancy.

Study variables

The outcome variable, modern contraceptive use, was coded as a binary outcome into *'yes'* for women who reported using a modern method of contraception and *'no'* for women not using any method or those using folkloric and traditional methods of contraceptives. Contraceptive methods considered 'modern' included the pill, IUD, injectables, condom, female sterilization, male sterilization, norplant, lactational amenorrhea and female condom as classified by the DHS program. The key explanatory variable is migration stream, coded as a six-level variable as follows: non-migrant urban, non-migrant rural,

urban-urban migrants, urban-rural migrants, rural-urban migrants and rural-rural migrants. The migration variable is generated using reports on current place of residence and previous place of residence as reported by the respondents. The DHS asked the question, "how long have you been living continuously in this (current) place of residence?" Those who answered 'always' were classified as non-migrants (either rural or urban), while those who answered in terms of 'number of years lived at the current place of residence' were further asked a question on previous place of residence before current residence to which they answered by stating previous residence as 'city or in a town or in the countryside'. This information was further used to construct six migration streams namely: urban non-migrants, rural non-migrants, rural-urban, rural-rural, urban-urban, urban-rural. The inclusion of explanatory variables is informed by a conceptual framework that proposes the influence of socio-demographic factors (age of the woman, marital status, number of living children, religion, fertility preference, region of residence, and marital duration), and socio-economic factors (level of education, wealth index, occupation and hearing family planning message on media) on modern contraceptive use and migration stream.

Data analysis

Analysis of the data was carried out using STATA v.14, descriptive statistics were generated to provide basic sample characteristics such as socio-demographic characteristics. Secondly, bivariate logistic regression of the outcome variable, modern contraceptive use, and explanatory variables was carried out to determine significance of associations between the outcome variable and explanatory variables. Explanatory variables were considered significant at a p-value of 0.05 or less. Multivariate logistic regression was fitted to predict correlates of contraceptive use in the presence of explanatory variables. All the analyses were weighted to account for differences in sampling probabilities. We fit three models to assess the influence of migration stream as a key explanatory variable. Model I assesses the influence of migration stream and modern contraceptive use, model II adjusts for the influence of migration stream and socio-demographic factors and model III determines the influence of migration stream in the presence of both socio-demographic and socio-economic factors.

Results

Sample description

A description of the 5,905 women who use modern contraceptives is shown in Table 1. Slightly more than a third (34.5 %) of the respondents reported current use of a modern method of contraception. The use of modern contraceptives was high among non-migrant urban women 46.6 %, followed by rural-urban and urban-rural migrants at 44.4 and 38.5 % respectively. Considering age of the woman, modern contraceptive use was 44.0 % and 26.5 % among women aged 25–34 years and 15–24 years respectively. Women currently in marriage were the majority (41.4 %) of modern contraceptive users. Similarly, a vast majority of women with 3–5 children (42.2 %) and protestantants (36.5 %) reported using modern contraceptives. The use of modern contraceptives was also high among women in Central (52.5 %), Nairobi (42.7 %) and Eastern (38.8 %) regions. A large proportion of women with secondary/higher education (42.4 %), from medium (38.8 %) and high (42.7 %) income households and those who engaged in professional work (42.5 %) reported use of modern contraceptives. Access media messages on family planning also contributed to the use of modern contraceptives (39.6 %).

Correlates of modern contraceptive use

Regression models were fit to identify correlates of modern contraceptive use with the key explanatory variable, migration stream. We identified socio-demographic and socio-economic factors such as migration stream, age, marital status, number of living children, religion, fertility preference, region of residence, marital duration, level of education, wealth index, occupation and access to media messages on family planning, as shown in Table 2 to be significantly ($p < 0.001$) associated with modern contraceptive use. Multivariate logistic regression adjusted for various factors in Model I-III where most of the associations remained significant as shown in Table 3. The reference category for each variable is given in parentheses. Modern contraceptive use was significantly higher among women in all migration streams (non-migrant urban (OR = 2.8, $p < 0.001$), urban-urban (OR = 2.0, $p < 0.001$), urban-rural (OR = 2.0, $p < 0.001$), rural-urban (OR = 2.6, $p < 0.001$), rural-rural (OR = 1.7, $p < 0.001$), than non-migrant rural women as shown in model I.

In model II, we adjust for the effects of migration stream and socio-demographic factors and observe an increased likelihood to use modern contraceptives among women in all migration streams and particularly non-migrant urban women, (OR = 3.4, $p < 0.001$) compared to non-migrant rural women. Women aged 25–34 years were also 1.3 times ($p < 0.05$) more likely to use modern contraceptives than those below 25 years. Similarly, there was a higher likelihood to use modern contraceptives among currently married women (2.7 times, $p < 0.001$) compared to formerly married women. Having 1–2 children (1.8 times, $p < 0.001$) and 3–5 children (1.8 times, $p < 0.001$) increased the likelihood to use modern contraceptives compared to having no children. Women from the Muslim or other faiths were less likely (0.6 times, $p < 0.001$) to use modern contraceptives than women who subscribe to the Catholic faith. There was an increased likelihood to use modern contraceptives among women who did not desire more children

Table 1 Percent distribution of socio-demographic and socio-economic characteristics of migrant and non-migrant women using modern contraceptives in Kenya

Characteristics	Percent (%)	95 % CI	N [Weighted]
Migration stream			
Non-migrant urban	46.6	[37.1–56.4]	263
Non-migrant rural	23.7	[20.5–27.3]	1,430
Urban-urban	38.3	[31.0–46.2]	644
Urban-rural	38.5	[33.6–43.6]	585
Rural-urban	44.4	[39.7–49.2]	620
Rural-rural	35.1	[32.3–37.9]	2,361
Socio-demographic factors			
Age			
15–24	26.5	[23.4–29.8]	1,759
25–34	44.0	[40.9–47.1]	2,280
35–49	30.5	[27.3–34.0]	1,866
Marital status			
Never married	17.3	[14.5–20.6]	1,123
Currently married	41.4	[38.8–44.1]	4,035
Formerly married	23.0	[19.0–27.6]	746
Living children			
None	16.4	[13.0–20.5]	785
1–2	38.6	[35.5–41.7]	2,215
3–5'	42.2	[39.0–45.4]	2,084
6+	21.4	[17.8–25.5]	820
Religion			
Catholic	35.7	[31.7–39.9]	1,287
Protestant	36.5	[34.3–38.8]	4,043
Muslim/other	17.8	[12.7–24.4]	576
Fertility preference			
Want another child	29.9	[27.5–32.6]	2,817
Undecided	33.6	[22.9–46.4]	177
Want no more	39.0	[36.3–41.8]	2,911
Region			
Nairobi	42.7	[37.2–48.3]	527
Central	52.5	[47.0–58.0]	626
Coast	30.9	[23.8–39.0]	474
Eastern	38.8	[33.7–44.3]	981
Nyanza	28.8	[25.6–32.3]	990
Rift valley	29.2	[25.0–33.8]	1,632
Western	33.9	[30.2–37.8]	561
North Eastern	3.9	[1.3–11.0]	114
Marital duration			
Never married	17.3	[14.5–20.6]	1123
0–9 years	42.6	[39.2–46.1]	2095
10–24 years	41.1	[37.8–44.6]	1621
20 and more years	26.6	[23.1–30.4]	1067
Socio-economic factors			
Education			
None	10.1	[7.0–14.3]	576
Primary	34.0	[31.5–36.6]	3327
Secondary/Higher	42.4	[39.2–45.7]	2002
Wealth index			
Low	21.3	[18.6–24.3]	1881
Medium	38.8	[35.6–42.2]	2132
High	42.7	[40.1–45.4]	1892
Occupation			
Not working	26.7	[24.1–29.4]	1997
Professional/technical/manager/clerical/sales/service	42.5	[39.5–45.5]	1805
Agri-employee/household domestic/manual	35.1	[32.2–38.2]	2103
Heard FP on media			
No	19.8	[17.5–22.4]	1530
Yes	39.6	[37.6–41.7]	4375
Total (N)	34.5	[32.6–36.5]	5905

CI confidence interval

(1.5, $p < 0.001$) compared to their counterparts who wanted another child. Women from Central region (2.1 times, $p < 0.001$) were more likely to use modern contraceptives than those from Nairobi, while those from North Eastern were less likely (0.8 times, $p < 0.001$) to use modern contraception compared to those from Nairobi.

In model III, we adjust for the effects of migration stream, socio-demographic and socio-economic factors, and according to the results migration stream remains an important factor in determining modern contraceptive use where non-migrant urban women (2.1 times, $p < 0.01$) were more likely to use modern contraceptives than non-migrant rural women. Older women (35 years and above) were less likely to use modern contraceptives ($p < 0.05$) than their younger counterparts (under 25 years). There was an increased likelihood to use modern contraceptives for women with 1–2 children (1.8 times, $p < 0.001$), 3–5 children (2.2 times, $p < 0.001$) compared to those with no children. Similarly, women who did not desire to have more children (1.5 times, $p < 0.001$) were more likely to use modern contraceptives than those wanting another child. Residents of Central region were more likely to use modern contraceptives, than those residing in Nairobi, on the hand, women from Nyanza and North Eastern region were less likely to use modern contraceptives compared to those from Nairobi region.

Table 2 Association between modern contraceptive use and background characteristics of migrant and non-migrant women 15–49 years in Kenya

Characteristics	Odds ratio	95 % CI
Migration stream [Non-migrant rural]		
Non-migrant urban	2.807***	[1.82–4.33]
Urban-urban	1.994***	[1.37–2.91]
Urban-rural	2.009***	[1.52–2.66]
Rural-urban	2.563***	[1.96–3.35]
Rural-rural	1.734***	[1.43–2.11]
Socio-demographic factors		
Age [15–24 years]		
25–34	2.176***	[1.76–2.69]
35–54	1.219	[0.99–1.51]
Marital status [Formerly married]		
Never married	0.700*	[0.51–0.97]
Currently married	2.365***	[1.84–3.03]
Living children [None]		
1–2	3.194***	[2.38–4.28]
3–5'	3.711***	[2.72–5.06]
6+	1.389	[0.98–1.96]
Religion [Catholic]		
Protestant	1.037	[0.85–1.26]
Muslim/Other	0.391***	[0.26–0.59]
Fertility preference [Want another child]		
Undecided	1.186	[0.70–2.01]
Want no more	1.495***	[1.27–1.76]
Region [Nairobi]		
Central	1.485*	[1.08–2.04]
Coast	0.601*	[0.39–0.92]
Eastern	0.852	[0.62–1.17]
Nyanza	0.544***	[0.41–0.72]
Rift valley	0.553***	[0.40–0.76]
Western	0.689**	[0.52–0.91]
North Eastern	0.055***	[0.02–0.17]
Marital duration [20 and more years]		
Never married	0.579***	[0.44–0.76]
0–9 years	2.055***	[1.64–2.58]
10–24 years	1.932***	[1.56–2.39]
Socio-economic factors		
Education [None]		
Primary	4.601***	[3.02–7.01]
Secondary/Higher	6.588***	[4.24–10.25]
Wealth index [Low]		
Medium	2.345***	[1.84–2.99]
High	2.759***	[2.26–3.37]
Occupation [Not working]		
Professional/technical/ manager/clerical/ sales/service	2.027***	[1.72–2.40]
Agri-employee/household domestic/manual	1.485***	[1.24–1.77]
Heard FP on media [No]		
Yes	2.658***	[2.25–3.14]

*p < 0.05; **p < 0.01; ***p < 0.001; CI - Confidence interval - 95 %

Having at least primary education ($p < 0.001$) increased the likelihood to use modern contraceptives twofold while women engaged in professional and agriculture/household related occupations were 1.5 times ($p < 0.001$) and 1.3 times ($p < 0.01$) respectively more likely to use modern contraceptives that those not engaged in any economic activity. Socio-economic status was also associated with modern contraceptive use, women from at least medium wealth households were more likely ($p < 0.001$) to use modern contraceptives than those from low wealth households. Exposure to family planning messages from the media increased the likelihood to use modern contraceptives 1.8 times, $p < 0.001$ compared to non-exposure to media messages.

Discussion

This study is an attempt to explore the effect of migration on modern contraceptive use among women aged 15–49 years in Kenya. The bivariate and multivariate logistic analysis results indicated that migration stream was significantly associated with current use of modern contraceptive methods. The analysis shows that, migrant women, regardless of their migration stream, have a higher likelihood to use modern contraceptives than non-migrant rural women. Despite this finding, our results further show that non-migrant urban women were more likely to use modern contraception than women from different migration streams a possible indication of the adaption effect. Generally, contraceptive use is higher in urban than rural areas, thereby giving the non-migrant urban women advantages over women from all other migration streams [16, 21]. On the other hand, rural-urban migrants were more likely to use modern contraceptives compared to their non-migrant rural counterparts, possibly an indication of the adaption effect that assumes that as these women move to urban areas, they acquire urban characteristics including

Table 3 Odds ratio of modern contraceptive use among migrant and non-migrant woman in Kenya

	Model I		Model II		Model III	
Characteristics	Odds ratio	95 % CI	Odds ratio	95 % CI	Odds ratio	95 % CI
Migration stream [Non-migrant rural]						
Non-migrant urban	2.807***	[1.82–4.33]	3.380***	[1.93–5.92]	2.137**	[1.20–3.80]
Urban-urban	1.994***	[1.37–2.91]	1.885***	[1.23–2.88]	1.120	[0.69–1.81]
Urban-rural	2.009***	[1.52–2.66]	1.520**	[1.14–2.03]	1.208	[0.88–1.65]
Rural-urban	2.563***	[1.96–3.35]	2.054***	[1.53–2.77]	1.373	[0.97–1.94]
Rural-rural	1.734***	[1.43–2.11]	1.181	[0.96–1.46]	1.128	[0.91–1.40]
Socio-demographic factors						
Age [15–24 years]						
25–34			1.362**	[1.07–1.74]	1.148	[0.88–1.49]
35–54			0.924	[0.67–1.27]	0.704*	[0.51–0.97]
Marital status [Formerly married]						
Never married			1.411	[0.94–2.13]	1.256	[0.83–1.89]
Currently married			2.708***	[2.08–3.53]	2.631***	[2.03–3.41]
Living children [None]						
1–2			1.750***	[1.27–2.42]	1.808***	[1.31–2.50]
3–5'			1.822***	[1.25–2.65]	2.184***	[1.50–3.19]
6+			0.938	[0.61–1.43]	1.347	[0.88–2.06]
Religion [Catholic]						
Protestant			1.054	[0.85–1.30]	1.009	[0.81–1.25]
Muslim/Other			0.427***	[0.28–0.65]	0.610*	[0.39–0.94]
Fertility preference [Want another child]						
Undecided			1.145	[0.64–2.04]	1.142	[0.65–2.01]
Want no more			1.547***	[1.25–1.92]	1.496***	[1.21–1.85]
Region [Nairobi]						
Central			2.111***	[1.45–3.08]	1.586**	[1.09–2.31]
Coast			0.891	[0.64–1.25]	0.977	[0.70–1.36]
Eastern			1.249	[0.84–1.85]	1.228	[0.84–1.80]
Nyanza			0.768	[0.55–1.08]	0.678*	[0.48–0.96]
Rift valley			0.828	[0.60–1.14]	0.794	[0.58–1.09]
Western			1.014	[0.71–1.44]	0.959	[0.69–1.34]
North Eastern			0.172***	[0.06–0.52]	0.351*	[0.13–0.97]
Marital duration [20 and more years]						
Never married			1.000	-	1.000	-
0–9 years			1.551**	[1.11–2.16]	1.519*	[1.08–2.13]
10–24 years			1.513***	[1.17–1.96]	1.452**	[1.11–1.90]
Socio-economic factors						
Education [None]						
Primary					2.031***	[1.34–3.07]
Secondary/Higher					2.620***	[1.66–4.13]
Wealth index [Low]						
Medium					1.631***	[1.26–2.11]
High					1.623**	[1.17–2.26]

Table 3 Odds ratio of modern contraceptive use among migrant and non-migrant woman in Kenya *(Continued)*

Occupation [Not working]		
Professional/technical/manager/clerical/sales/service	1.525***	[1.22–1.91]
Agri-employee/household domestic/manual	1.304**	[1.08–1.58]
Heard FP on media [No]		
Yes	1.838***	[1.50–2.25]

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; *CI* - Confidence interval - 95 %

adoption of contraceptive use in the process of acquiring and adapting to the way of the urban area [22, 23]. Brockerhoff in a 1995 study also found migrant women to change their characteristics and adapt those of their destination including fertility behaviour [15]. The pattern of modern contraceptive use depicted among migrant women in this study is typical of the configuration of contraceptive services in Kenya where greater access is reported in urban than rural areas [14].

Migration streams is significantly but diversely related to contraceptive use in Kenya as also shown elsewhere in sub-Saharan Africa [17]. Rural-urban migrants and urban-urban migrants have a higher likelihood of using contraceptives than rural-rural migrants and non-migrant rural women. Among non-migrants, place of residence (mostly urban residence) has been found to be a determining factor in modern contraceptives use. However, migration occurring between various locations, especially from rural to urban areas, seems to result in greater changes in contraceptive attitudes and behaviours usually attributed to external stimuli [7]. Internal migration (migration within a country) and to some extent external migration (migration to a different county or continent) is most often associated with social, cultural, economic and environmental changes which can spur attitude and behaviour change [2]. More so, the fact that migrant women are more likely to use modern contraceptives supports the notion that innovative ideas or information on fertility regulation are more reinforced in urban than rural settings which are less developed, and traditional. Furthermore, this analysis is supportive of the hypothesis that exposure to urban environments is associated with better socio-economic indicators and in essence validates the self-selection theory [1].

While adjusting for the effects of socio-demographic characteristics of the migrant and non-migrant women, it is apparent that migration status remains important in determining modern contraceptive use. Additionally, women in their prime reproductive ages, 25–34 years, being currently married, having 1–5 children, desiring no more children and being resident of Central region had increased odds of modern contraceptive use. These can be attributed to the disruption effect that seems incompatible with childbearing. The disruption effect comes into play by delaying childbearing either by separation or time taken to adjust at the new environment [24]. When we adjust for the effects of both socio-demographic and socio-economic factors, the effect of migration reduces possibly confirming the selection effect which states that migrants are self-selecting group with characteristics that cause delays in childbearing [15]. Lending further credence to the socio-economic differences in rural and urban areas in Kenya, where higher values of economic indicators are observed for the urban areas and less so for most rural areas. In the multivariate analysis, migration status, age of women, number of living children, education, occupation, being currently married, listenership to family planning messages on media, region of residence and wealth index were seen to play a vital moderating role in the use of modern contraceptive methods. These findings are consistent with other studies conducted in sub-Saharan Africa [25, 26]. More so, although socio-economic differentials in knowledge and perceptions, access to health facilities and health information, and associated costs influence uptake of modern contraceptive use among migrants, the specific mitigating factors warrants further study.

The main strength of this study is the use of national population-based data hence the findings can be generalized at the country level. However, the major limitation is the use of one data point which fails to document the occurrence of multiple events over time. This could have led to potential misclassification of contraceptive use or migration status, however, with regards to the latter, most migrants in this study reported that they had resided in the current place of residence for a duration of time, and therefore the effects of misclassification on contraceptive use are likely minimal. This study indicates the need for further research on migrants and non-migrants, to clarify the role of rural-urban environments and individual behaviors in promoting modern contraceptive use as well as interventions to promote family planning methods in rural areas.

Conclusion

This study confirms the central role played by migration notably migration streams which have a direct consequence on individual's social, cultural, economic and environmental changes which in effect impacts

contraceptive use. The evidence from this study can be useful to policy makers, programme implementers and stakeholders to help inform future interventions and also improve health services among various categories of the population in Kenya. Programmatically, the differentials in modern contraceptive use by the different migration streams should be considered when designing programmes in response to family planning needs of migrant and non-migrant women. It was also evident that migrants exhibited higher modern contraceptive use due to access to higher levels of education, employment among other factors. Enabling access to such services by the government will help increase higher contraceptive use especially in rural areas where the provision of similar services remains inadequate.

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Authors' contributions
RO Participated in the overall conceptualization and inception of the idea of the manuscript, with lead roles in conducting literature review, data analysis, writing up the introduction, methods and results sections, IA: assisted in conceptualization of the idea of this manuscript and provided overall guidance and review of the manuscript with particular attention on how it adds to the body of literature in Kenya. JOk wrote the discussion section and reviewed the paper, JOu: assisted in conceptualization of the idea of this manuscript, and MT: provided overall guidance and review of the manuscript with particular attention on how it adds to the body of literature in Kenya. All authors read and approved the final manuscript.

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Competing interests
The authors declare that they have no competing interests.

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Article 6

4.6 Determinants of modern contraceptive use among sexually active men in Kenya

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Article 6 presents findings from a study conducted to understand determinants of contraceptive use among men. This paper addresses Objective 1 that seeks to get insights on the determinants of contraceptive use among vulnerable populations. Although men are not considered vulnerable, the study of contraceptive use among men remain critical given their role in making decisions and influencing contraceptive uptake among their partners.

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RESEARCH Open Access

Determinants of modern contraceptive use among sexually active men in Kenya

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Abstract

Background: Research in Kenya has focussed on family planning from women's perspectives, with the aim of helping reduce the burden of unintended pregnancies. As such, the determinants of modern contraceptive use among sexually active women are well documented. However, the perspectives of men should be considered not only as women's partners, but also as individuals with distinct reproductive histories and desires of their own. This study seeks to understand the determinants of modern contraceptive use among sexually active men, by exploring factors that are correlated with modern contraceptive use.

Methods: The data source is the nationally representative 2014 Kenya Demographic and Health Survey (DHS) of men aged 15–54 years. The analysis is restricted to 9,514 men who reported being sexually active in the past 12 months prior to the survey, as they were likely to report either doing something or not to avoid or delay pregnancy. We use bivariate and multinomial logistic regression to assess factors that influence modern contraceptive use among sexually active men.

Results: Findings from the bivariate and multinomial logistic regression indicate that region of residence, marital status, religion, wealth, interaction with a health care provider, fertility preference, number of sexual partners and access to media were all significantly associated with modern contraceptive use among sexually active men.

Conclusion: Provider-client interaction as well as dissemination of information through mass media has the potential to increase knowledge and uptake of modern contraceptives. Similar efforts targeting segments of the population where contraceptive uptake is low are recommended.

Keywords: Modern contraceptive use, Men, Family planning, Kenya

Plain English Summary

Men should be considered not only as women's partners, but also as individuals with distinct reproductive histories and desires of their own. This study sought to understand the determinants of modern contraceptive use among sexually active men, by exploring factors that are associated with modern contraceptive use. Relative strength of these associations is explored in bivariate and multivariate models. Findings indicate that region of residence, place of residence, marital status, religion, wealth, interaction with a health care provider, fertility preference, number of sexual partners and having access to media were all significantly associated with modern contraceptive use among sexually active men. Provider-client interaction as well as dissemination of information through mass media has the potential to increase knowledge and uptake of modern contraceptives. Similar efforts targeting segments of the population where uptake is low is recommended.

Background

The 2014 Kenya Demographic and Health Survey reports the contraceptive prevalence rate (CPR) for Kenya as 58% among married women, and 65% among sexually active unmarried women [1]. While CPR has steadily increased over the years, the same survey shows continued variances across the country based on age, region, level of education, among other determinants. For instance, married women from urban areas were found to have a CPR of 62% while those from rural areas were at 55%, and married women with secondary education or

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higher had a CPR of 65% while those with no education were at 18%. Similar findings have been documented in other sub-Saharan Africa countries including research from Ghana that showed increasing trends in contraceptive use when analysing data from 5 consecutive Ghana Demographic Health Surveys between 1988 and 2008, and residence as well as education being key determinants of contraceptive use [2]. Despite the steady improvement in CPR, it still falls short of the targets for the now defunct Millennium Development Goal set at 70% for Kenya. The FP2020 2015–2016 progress report shows that the unmet need for contraception for Kenya now stands at 20.1% [3], another indication that steady progress is being made towards achieving the Sustainable Development Goal 3, 'ensure universal access to sexual and reproductive healthcare services, including family planning, information and education, and the integration of reproductive health into national strategies and programmes by 2030' [4].

Research in Kenya has focussed on family planning from women's perspectives, with the aim to help reduce the burden of unintended pregnancies [5–7]. Despite this, men are important given their role in sex and reproduction. Additionally, population scientists have focused their study on fertility almost exclusively on the fertility behaviour of women while paying little attention to the role of men and the implication of their participation on fertility and population growth [5]. Several studies have highlighted the influence of men on reproductive decisions such as number of children and contraceptive use, noting that men's influence may not necessarily reflect the reproductive decisions of their wives [6, 7]. A review of DHS data from Bangladesh, Dominican Republic and Zambia showed that calculated unmet need for wives differed from the calculated unmet need for husbands and couples [8], indicating that men also have their own fertility desires. Many family planning programmes also exclude the participation of men. Since men are the heads of households, they make decisions around the well-being of their households including decisions on family planning [9]. In recent years, efforts are underway to broaden men's involvement in reproductive health and family planning. More specifically, measures are underway to improve gender relations and men's understanding of their familial and social roles in family planning and sexual and reproductive health issues [10]. For a country like Kenya where population growth, HIV/AIDS and youth pregnancies are all serious issues for development, improving contraception uptake is an important priority for public health [11].

The role of others in influencing family planning use or non-use is well documented in Kenya [12–15]. Analysis of the 1994 Kenya Situation Survey found that women who had discussed family planning with both core and extended network members were 8 times as likely to be currently using modern contraceptives, and men who had done so were 3 times as likely as were those who had limited such discussions to their core network only [16]. In other parts of sub-Saharan Africa, research shows how social networks can strengthen positive messages among users; for example, in Cameroon a study found 55% of the sample reported how at least one network partner encouraged use of contraceptives [17, 18]. However, social networks can also propagate myths about family planning by exaggerating side effects and spreading rumours [13, 19, 20]. Findings from research by Ochako et. al, confirm that a major barrier to starting use of modern contraceptives among young women is myths and misconceptions, learned from others in their social network [6]. The decision for a woman to use contraception or not is primarily influenced by others, whose views and perceptions are often more important than an individual's own [6, 12].

Gender and social norms play a key role in the decision to use or not to use contraception, with men playing a greater part in this decision [21, 22]. In particular, the views and perceptions of the husband/partner are key in determining contraceptive use [23–26]. A study in Kenya found that husbands had great decision making power and the ability to effect compliance or submission from their wives [27]. Husband's approval of contraception is also crucial for successful family planning programmes. Studies have shown that family planning adoption is likely to be more effective for women when men are actively engaged by the programmes, through education or other targeted activities [28–30]. Although many researchers advocate for including men in family planning programs, data on men's knowledge and use of contraception remains scarce [24–26, 31–37]. Demographic studies on fertility and family planning, both quantitative and qualitative, large scale and small, have tended to focus on women alone [24, 38]. This is now changing slowly and a brief review of the published literature from Sub-Saharan Africa is set out below.

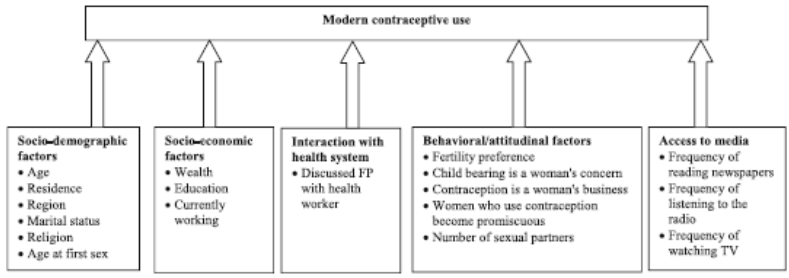
Vouking, Evina and Tadenfok analyzed data from several sub-Saharan countries on male involvement in family planning [39]. Their findings indicate that while male knowledge of family planning was almost universal, their involvement in the decision making process was not as straight-forward with a majority of men disagreeing that they should make decisions about selected family planning issues in the family. Further, female respondents were of the opinion that the selection of a contraceptive method was equally made by women or jointly, with male-dominated decisions falling last. Additional studies from sub-Saharan Africa add to the

complexity of male involvement in family planning. For example, in Southwestern Nigeria, a study with men concluded that male involvement in family planning decision making was poor and their use of family planning services was low [40]. While in the same region, a different (more comprehensive) study found almost twice as many men as women consenting to the use of family planning with the male partner being highly motivated to obtain contraceptives, particularly in extramarital relationships [41].

Studies from Ethiopia have more consistent results in regards to men and family planning. In Tigray region, a cross-sectional survey found that over 90% of men supported and approved of using family planning; however, 36% of men did not know about male contraceptive methods [42]. Similarly, approval was 90% in Southern Ethiopia [23] and in Jimma Zone (93%), where only 4 out of 811 men ever used contraception [43]. In Northwest Ethiopia, a study with men found that only 8% of respondents were using or directly participating in the use of family planning services [44]. In Uganda, researchers used data from the 2011 DHS to identify factors that influenced modern contraceptive use among sexually active men. Findings indicated that discussion of family planning with a health worker, region, education, wealth index, number of surviving children and fertility preference were most significantly associated with modern contraceptive use among men [32]. One of the few published studies from Kenya on male involvement in family planning used focus group discussions to understand perceptions among low-income men in Western Kenya. This study found men's knowledge of contraception inadequate, as their knowledge was poor and they had many misconceptions [15]. The situation among urban and other Kenyan male groups is likely, however, to be different. An in-depth analysis of DHS data from 58 men's surveys across 18 countries in Africa, Asia, Latin America and the Caribbean further highlights the varied knowledge on contraceptive methods by age, marital status and educational level [45]. It is important to note that there are only two modern contraceptive methods for men which are the male condom and vasectomy, which registered at 3.1 and 0.0%, respectively, among all sexually active women respondents from the 2014 KDHS [1]. All the same, efforts are being made to increase the uptake of vasectomy with Kenya being among the 40 countries worldwide that will be commemorating World Vasectomy Day on November 18th 2016 [46].

Men should be considered not only as women's partners, but also as individuals with distinct reproductive histories and desires of their own [24]. Adopting a similar methodology to the Uganda study [32], this paper seeks to understand the determinants of modern contraceptive use among sexually active men, by exploring factors (explanatory variables) that are correlated with modern contraceptive use (outcome variable). Further, it will explore the relative strength of these associations in bivariate and multivariate models. Findings from this study will be of significant importance not only to the Government of Kenya, but also to partner organizations working on family planning in Kenya to inform programs that influence contraceptive use decisions among men and women. Additionally, the paper seeks to contribute to the discussion of men's place in reproductive health research.

In order to inform our analysis, we used a customized conceptual framework to understand the determinants of modern contraceptive use among men, this builds on existing knowledge on factors associated with contraceptive use. We hypothesize that factors associated with modern contraceptive use operate at different levels.



In our framework we consider the socio-demographic factors, socio-economic factors, interaction with the health system, access to media, and behavioural/attitudinal factors as the main potential influencers of modern contraceptive use among men. The socio-demographic factors are hypothesized to operate directly to influence modern contraceptive use, and so do socio-economic factors, interaction with the health system, behavioral/attitudinal factors and the factors related to access to media. We therefore fit five models to explore these relationships in multinomial models.

Methods

Source of data

The data source is the nationally representative 2014 Kenya Demographic and Health Survey (DHS) of men aged 15–54 years. The survey was designed to provide population and health indicator estimates at the national, provincial level and county level. The Kenya DHS applied probability sampling to provide nationally representative samples of men aged 15–54 years. The survey was conducted by the Kenya National Bureau of Statistics and ICF International. Interviews with men covered 12,819 of the eligible 14,217 men, yielding a response rate of 90.2%. Data was weighted in order to adjust for differences in probability of selection and to adjust for non-response. As of April 2016, this was the latest survey data available for Kenya. This analysis is restricted to the 9,514 (weighted) men who reported being sexually active in the 12 months prior to the survey, as they were likely to report either doing something or not to avoid or delay a pregnancy. We excluded from analysis men who reported that either them or their partners were infecund or sterile as they were not exposed to the risk of pregnancy.

Study variables

The men's questionnaire reports contraceptive use among men through the following question, 'Are you currently doing something or using any method with any partner to delay or avoid a pregnancy?' those who responded with a '*yes*' were further asked to state the method they were personally using or their partner(s) were using. The options listed included: not using, pill, IUD, injections, condom, female sterilization, male sterilization, implants/norplant, lactational amenorrhea, periodic abstinence, female condom, and withdrawal. Out of these categories, the outcome variable, modern contraceptive use, was coded as a three outcome variable as: '*traditional/no method*' for those who reported current non-use of modern contraceptive methods or use of traditional or natural methods (such as periodic abstinence, lactational amenorrhea and withdrawal) which are not effective in pregnancy prevention; '*partner method*' for those who reported using a method through their partner (such methods include pill, IUD, injections, female sterilization and norplant); and '*male method*', for those who reported using male only methods (such as condoms and male sterilization).

The explanatory variables were grouped into categories hypothesized to influence modern contraceptive use, as shown in the conceptual framework above. The socio-demographic factors (age, residence, region, marital status, religion and age at first sex); socio-economic factors (wealth; education and employment status); interaction with health system (discussed FP with health worker); behavioural/attitudinal factors (fertility preference, child bearing is a woman's concern, contraception is a woman's business, women who use contraception become promiscuous and number of sexual partners); and access to media (frequency of reading newspapers, frequency of listening to the radio and frequency of watching TV) are hypothesized to influence modern contraceptive use as shown in the conceptual framework above.

Data analysis

Data analysis was carried out using STATA v.14, descriptive statistics were used to provide sample characteristics including socio-demographic characteristics, exposure to family planning messages, interaction with health system and sexual behaviour. Secondly, we carried out bivariate analysis between each explanatory variable and the outcome variable to determine the variables to include in the five multivariate models as informed by our conceptual framework. Explanatory variables that were significantly associated with the outcome variable at 5% level of significance or less, were included in the multinomial logistic regression models to further assess variables that were statistically associated with modern contraceptive use. Bivariate analysis was used to assess the individual relationship of each explanatory variable with modern contraceptive use while multivariate analysis was used to assess relationships while controlling for other explanatory variables. The outcome variable, a three outcome variable coded as none/traditional method, partner method and male method was fitted in multinomial models to predict the determinants of modern contraceptive use among sexually active men. In total five models were fitted as informed by our conceptual framework, Model I assessed the determinants of contraceptive use in relation to socio-demographic factors, Model II controlled for the effects of socio-economic factors, Model III controlled for interaction with the health care system. Model IV assessed the effects of behavioural/attitudinal factors and Model V, controlled for media access factors. All analyses were weighted to account for differences in sampling probabilities.

Results

Sample description

Table 1 shows the description of 9,514 sexually active men aged 15–54 years from Kenya who participated in the 2014 Kenya DHS. Thirty-nine percent (39%), reported using no method or a traditional method while about 36% and 25% of the respondents reported currently using a partner and male method, respectively. Slightly more than half (54%) of the respondents resided in rural areas and most (63%) of the men were currently married. Nearly all the respondents had attended school, with 48% having attained primary education whereas 49% had secondary or higher education. A large proportion of men (91%) were engaged in some income generating activity in the 12 months prior to the survey. About 39% had at least three children and about a third (31%) desired to have another child in future while 37% reported having no regular partners. Responses on attitudinal statements on gender norms showed that a vast majority of the men disagreed with the statements,'contraception is a woman's business' (86%), and 'women who use contraception become promiscuous' (68%). However, only a small proportion (13%) had discussed family planning with a health worker. The full characteristics of respondents are shown in Table 1.

Prevalence of modern contraceptive use among sexually active men

Table 2 shows the prevalence of modern contraceptive use in relation to selected factors categorized as socio-demographic status, socio-economic status, interaction with health care system, attitudinal/behavioural and media access of sexually active men. Considering the socio-demographic characteristics, there exists a significant positive association between age and use of partner methods. Men over 25 years were over three times as likely to use a partner method as compared to using traditional/no method. Conversely, these men were less likely to use a male method than traditional/no method, compared to younger men aged 15–24. Men with at least one child were more likely to report use of a partner method, but were less likely to report using a male method compared to those who had no children. Men whose last child was aged at least three years were five times more likely to report using a partner method than traditional/no method. Among these men with older children, reported use of a male method was much lower as compared to using traditional/no method. There was a significant difference between urban and rural men, where rural men were less likely to report use of a partner method compared to using traditional/no method, likewise, these men were less likely to report use of a male method compared to using traditional/no method than their urban counterparts. Contraceptive use varied by region of residence where men from Central were less likely to report a partner method as opposed to using traditional/no method. Men from Coast, Eastern, Rift Valley, Western and North Eastern were all more likely to report use of a partner method than a traditional/no method compared to those from Nairobi. Regarding marital status, currently married men were four times more likely to report a partner method than traditional/no method but less likely to use a male method. Men in monogamous marriages, and those in marriage for less than a year and onwards, were more likely to report using a partner method than using traditional/no method.

Associations with socio-economic factors show that men with higher levels of education and wealth were more likely to use a partner method as compared to using traditional/no method. The analysis further showed that interaction with the health care system (having discussed FP with a health worker) increased the likelihood of men to report using a partner method than use traditional/no method. Whereas behavioural/attitudinal factors show that men who did not desire more children were more likely to report a partner method. Use of partner method was less common among men who reported having no regular partners. However their reported use of a male method was over 11 times as compared to using traditional/no method. Partner method use was negatively associated with agreeing with the following attitudinal statements: contraception is a woman's business, and women who use contraception become promiscuous. Men who read newspapers/magazines at least once week and those who watched TV at least once a week were more likely to report using a partner method as opposed to using traditional/no method.

Determinants of modern contraceptive use

Multinomial regression shown on Table 3 was applied using five models to assess the effect of explanatory factors on modern contraceptive use among sexually active men. Model 1 controls for the effect of socio-demographic factors and shows that men aged 25 years and above were more likely to report use of a partner method than use of a traditional/no method compared to those under 25 years. Men from Central were 0.9 times and 0.8 times, $p < 0.001$ less likely to report use of partner method and male method respectively than use traditional/no method compared to those from Nairobi. On the other hand, men from Coast (1.7 times, $p < 0.001$), Eastern (2 times, $p < 0.001$) and North Eastern (1.7 times, $p < 0.05$), were more likely to report use of a partner method than use traditional/no method compared to men from Nairobi. Moreover, men from Coast, Eastern, Rift Valley and North Eastern were more likely to use a male

Table 1 Sample characteristics of sexually active men 15–54 years in Kenya [Weighted]

Characteristics	Percent (%)	N
Contraceptive use		
None/traditional	38.6	3,673
Partner method	36.4	3,462
Male method	25.0	2,378
Socio-demographic factors		
Age		
15–24	24.8	2,358
25–34	34.7	3,297
35–54	40.6	3,858
Living children		
None	31.0	2,951
1-2	30.2	2,875
3+	38.8	3,688
Age of last child		
No child	31.2	2,965
0–2 years	33.1	3,147
3+ years	35.7	3,401
Residence		
Urban	46.1	4,382
Rural	53.9	5,132
Region		
Nairobi	10.0	951
Central	1.1	102
Coast	15.1	1,434
Eastern	13.5	1,289
Nyanza	25.7	2,444
Rift valley	8.9	847
Western	11.7	1,114
North Eastern	14.0	1,332
Marital status		
Never married	30.5	2,900
Currently married	63.2	6,012
Formerly married	6.3	601
Religion		
Catholic	22.8	2,170
Potestant	67.0	6,379
Muslim	5.4	513
No religion	4.7	451
Number of wives		
No wives/partners	36.8	3,501
1 wife	59.5	5,663
2 and more wives	3.7	349
Age at first marriage		
Never married	30.5	2,900
11–24 years	40.3	3,833
25 and more years	29.2	2,780
Age at first intercourse		
Less than 14 years	15.2	1,447
14–17 years	45.3	4,313
18–24 years	34.8	3,310
25 and more years	4.7	443
Marital duration		
Never married	30.5	2,900
0–9 years	29.9	2,844
10+ years	39.6	3,769
Socio-economic factors		
Wealth index		
Poor	23.1	2,195
Medium	30.9	2,943
Rich	46.0	4,376
Education		
None	3.1	295
Primary	47.7	4,541
Secondary/Higher	49.2	4,678
Currently working		
No	9.4	896
Yes	90.6	8,617
Interaction with health system		
Discussed FP with health worker		
No	87.2	8,297
Yes	12.8	1,216
Behavioural/attitudinal factors		
Fertility preference		
Want another child	31.3	2,977
Undecided	2.0	186
Want no more	29.4	2,800
No regular partner	37.3	3,551
Contraception is a woman's business		
Disagree	85.9	8,173
Agree	12.9	1,227
Don't know	1.2	114
Women who use contraception become promiscous		
Disagree	66.7	6,342
Agree	29.4	2,800
Don't know	3.9	372

Table 1 Sample characteristics of sexually active men 15–54 years in Kenya [Weighted] *(Continued)*

Number of sexual partners		
1 partner	9.8	929
2-5 partners	54.6	5,197
6+ partners	35.6	3,388
Access to media		
Frequency of reading newspaper/magazine		
Not at all	35.2	3,352
Less than once a week	21.2	2,015
At least once a week	43.6	4,147
Frequency of listening to radio		
Not at all	5.0	480
Less than once a week	7.6	721
At least once a week	87.4	8,312
Frequency of watching TV		
Not at all	21.1	2,009
Less than once a week	17.0	1,613
At least once a week	61.9	5,892
Total (N)	100.0	9,514

method than using traditional/no method. Currently married and formerly married men were more likely to report using a partner method but less likely to use a male method than using traditional/no method. Muslim men and men reporting no religion were less likely to report use of partner method as opposed to using traditional/no method than those of the Catholic faith.

In Model II we controlled for socio-economic factors, men belonging to upper wealth quintile households were more likely to report using male and partner methods than traditional/no method compared to those from poor households. Men reporting at least primary education were more likely to report use of partner or male method than traditional/no method compared to those with no education. Men who were currently working were more likely to report use of a partner method (4.5 times, $p < 0.001$), but were less likely (0.5 times, $p < 0.001$) to report use of a male method than traditional/no method compared to those who were not working. Model III controlled for interaction with a health system. In this model, men who had a discussion with a health worker were more likely to report usage of a partner method (1.7 times, $p < 0.001$) as opposed to traditional/no method. In model IV, we controlled for behavioral/attitudinal factors related to fertility preference. Here, men who desired no more children were 1.3 times ($p < 0.001$) more likely to report use of a partner method as opposed to usage of traditional/no method. On the other hand, men who had no regular partners were less likely to report use of a partner method but were 12 times ($p < 0.001$) more likely to report use of a male method than traditional/no method compared to those who reported wanting another child. With respect to the number of sexual partners, men who reported more than one sexual partner were more likely to use partner or male method as opposed to traditional/no method. Similar to the bivariate model, partner method use was negatively associated with agreeing with attitudinal statements on gender norms. Lastly, Model V controlled for access to media. It is evident from this model that men who read a newspaper/magazine at least once a week were more likely to report either use of partner method (1.6 times, $p < 0.001$) or male method (1.2 times, $p < 0.05$) than using traditional/no method. Radio listenership of at least once a week increased the likelihood to use partner or male method (1.8 times, $p < 0.001$), similarly, watching television at least once a week increased the likelihood to use partner or male method (1.7 times, $p < 0.001$) compared to use of traditional/no method than those who never watched television at all.

Discussion

This paper examined the correlates of using modern contraceptive methods among sexually active men in the reproductive bracket of 15–54 years using the 2014 Kenya DHS data. The findings from the bivariate logistic regression somewhat conform to the general literature on contraceptive use among women. In line with these studies, the bivariate analysis found that a number of socio-demographic and socio-economic factors are associated with contraceptive use (both partner and male methods) among sexually active men. These factors include age (men >25 years), number of children (at least three children), education and wealth status (at least primary education and high socio-economic status), marital status (currently married), marriage type (monogamous) gender norms (positive gender attitudes), place of residence (urban), region of residence (Central, Eastern and Coast), religion (being a Muslim) discussion with a health worker, listenership to radio, reading a newspaper and watching television. Like studies conducted among women in Kenya, men from rural areas were both less likely to use partner or male methods compared to their urban counterparts. Additionally, there were regional differentials with male residents from Central, Coast and Eastern provinces being more likely to use a partner method than men from North Eastern province. Although age, marital status, religion and place of residence were associated with contraceptive use in nearly all models, other factors specifically, education, wealth status, positive gender norms and access to media were found to be important predictors of contraceptive use.

Table 2 Bivariate association between modern contraceptive use and various background characteritics

	Partner method vs. None/traditional method			Male method vs. None/traditional method		
Characteristics						
Socio-demographic factors						
Age						
15–24	1.00			1.00		
25–34	3.83	***	[3.11–4.72]	0.41	***	[0.35-0.47]
35–54	3.57	***	[2.90-4.39]	0.14	***	[0.12-0.17]
Living children						
None	1.00			1.00		
1–2	5.58	***	[4.29-7.27]	0.27	***	[0.22-0.33]
3+	4.47	***	[3.54-5.66]	0.11	***	[0.09-0.14]
Age of last child						
No child	1.00			1.00		
0–2 years	4.68	***	[3.64-6.03]	0.15	***	[0.12-0.19]
3+ years	5.26	***	[4.17-6.63]	0.20	***	[0.16-0.24]
Residence						
Urban	1.00			1.00		
Rural	0.71	***	[0.61-0.84]	0.81	*	[0.67-0.97]
Region						
Nairobi	1.00			1.00		
Central	0.09	***	[0.04-0.19]	0.08	***	[0.04-0.19]
Coast	1.74	***	[1.32-2.29]	1.44	*	[1.09-1.90]
Eastern	2.30	***	[1.75-3.03]	1.61	***	[1.21-2.14]
Nyanza	1.23		[0.98-1.54]	1.28	*	[1.01-1.63]
Rift valley	1.59	**	[1.17-2.18]	1.24		[0.94-1.64]
Western	1.85	***	[1.45-2.36]	1.90	***	[1.47-2.46]
North Eastern	2.35	***	[1.67-3.31]	2.08	**	[1.32-3.29]
Marital status						
Never married	1.00			1.00		
Currently married	4.37	***	[3.51-5.45]	0.09	***	[0.07-0.10]
Formerly married	1.90	***	[1.29-2.79]	0.53	***	[0.40-0.69]
Religion						
Catholic	1.00			1.00		
Potestant	1.03		[0.87-1.22]	0.91		[0.77-1.08]
Muslim	0.33	***	[0.24-0.45]	0.46	**	[0.32-0.66]
No religion	0.48	***	[0.34-0.69]	0.72		[0.51-1.03]
Number of wives						
No wives/partners	1.00			1.00		
1 wife	3.77	***	[3.12-4.57]	0.09	***	[0.08-0.11]
2 and more wives	2.59	***	[1.81-3.70]	0.10	***	[0.06-0.16]
Age at first marriage						
Never married	1.00			1.00		
11–24 years	4.10	***	[3.26-5.16]	0.14	***	[0.11-0.16]
25 and more years	4.24	***	[3.35-5.38]	0.11	***	[0.09-0.14]
Age at first intercourse						

Table 2 Bivariate association between modern contraceptive use and various background characteritics *(Continued)*

Less than 14 years	1.00			1.00		
14–17 years	0.97		[0.78-1.20]	0.86		[0.70-1.07]
18–24 years	1.16		[0.94-1.45]	0.83		[0.67-1.04]
25 and more years	0.78		[0.57-1.07]	0.27	***	[0.16-0.44]
Marital duration						
Never married	1.00			1.00		
0–9 years	4.31	***	[3.39-5.48]	0.14	***	[0.11-0.17]
10+ years	4.05	***	[3.23-5.09]	0.11	***	[0.09-0.14]
Socio-economic factors						
Wealth index						
Low	1.00			1.00		
Medium	2.19	***	[1.87-2.58]	1.71	***	[1.44-2.03]
High	2.67	***	[2.25-3.18]	1.81	***	[1.48-2.22]
Education						
None	1.00			1.00		
Primary	6.63	***	[4.25-10.33]	4.15	***	[2.61-6.60]
Secondary/Higher	9.27	***	[5.90-14.57]	7.04	***	[4.38-11.31]
Currently working						
No	1.00			1.00		
Yes	4.55	***	[3.23-6.40]	0.50	***	[0.41-0.62]
Interaction with health system						
Discussed FP with health worker						
No	1.00			1.00		
Yes	1.71	***	[1.42-2.07]	0.84		[0.65-1.09]
Behavioral/attitudinal factors						
Fertility preference						
Want another child	1.00			1.00		
Undecided	1.30		[0.82-2.05]	1.25		[0.66-2.38]
Want no more	1.36	***	[1.16-1.60]	1.13		[0.83-1.54]
No regular partner	0.36	***	[0.29-0.44]	11.21	***	[8.63-14.57]
Contraception is a woman's business						
Disagree	1.00			1.00		
Agree	0.74	**	[0.61-0.89]	0.81	*	[0.66-0.99]
Don't know	0.09	***	[0.03-0.28]	0.50	*	[0.29-0.85]
Women who use contraception become promiscous						
Disagree	1.00			1.00		
Agree	0.60	***	[0.52-0.69]	1.01		[0.86-1.18]
Don't know	0.42	***	[0.30-0.58]	0.68	*	[0.48-0.97]
Number of sexual partners						
1 partner	1.00			1.00		
2–5 partners	2.02	***	[1.61-2.53]	1.19		[0.96-1.47]
6+ partners	2.37	***	[1.87-3.01]	1.11		[0.87-1.40]
Access						
Frequency of reading newspaper/magazine						
Not at all	1.00			1.00		

Table 2 Bivariate association between modern contraceptive use and various background characteritics *(Continued)*

Less than once a week	1.49	***	[1.23-1.81]	1.38	**	[1.11-1.71]
At least once a week	2.11	***	[1.83-2.45]	1.56	***	[1.31-1.87]
Frequency of listening to radio						
Not at all	1.00			1.00		
Less than once a week	1.62	*	[1.01-2.60]	2.04	***	[1.37-3.04]
At least once a week	2.56	***	[1.80-3.63]	2.32	***	[1.66-3.23]
Frequency of watching TV						
Not at all	1.00			1.00		
Less than once a week	1.65	***	[1.35-2.01]	1.65	***	[1.31-2.09]
At least once a week	2.29	***	[1.92-2.73]	1.95	***	[1.61-2.35]

*$p < .05$; **$p < .01$; ***$p < .001$

Overall, one consistently significant factor associated with contraceptive use after controlling for different factors in the five models was being a Muslim (Northern Eastern province is predominantly Muslim). This finding echoes similar findings from the Kenya DHS which showed the influence of religion on contraceptive use. Equally, studies conducted among women in Northern Eastern region have documented disproportionately low contraceptive use with high fertility levels (5.9 children per woman) as compared with other provinces in Kenya [8]. Factors underlying high fertility rates are linked to poor socio-economic indicators, more so, religion (the region is predominantly Muslim) as well as adherence to various cultural practices which have been noted to undermine family planning programs in the region. Similarly, North Eastern province has well over three quarters of its population in the lowest quintile and educational attainment is low (49.2% for males and 69.0% for females have no edication) compared to other provinces in Kenya [1, 47].

Our analysis also found that a vast majority of men rely on partner contraceptive methods as opposed to male methods. As described above, and echoing past literature, the predictors of contraceptive use among males are to a large extent related to male educational level and higher socio-economic status which are also important determinants for contraceptive use among women. In our analysis, we found a close association between male method use and men's wealth status, discussion with a health worker, number of partners as well as access to media. This potentially shows that in general the use of male methods increases with higher socio-economic status, perception of risk, less cultural conservatism and a favorable environment shown by the intervening variables [48].

Importantly, findings from this study draw attention to the role men may play as co-decision-makers relating to fertility and fertility control. For a long time, family planning programs and related research have until recently exclusively focused attention on women as the primary targets for information, education and communication for information and use. Men on the other hand, are viewed as having a marginal role to play on contraceptive practice. Consequently, the role of women who are perceived to be centrally placed in contraceptive practice has significantly increased. Despite this, men's positive or negative attitudes potentially determines women's decision making to use contraceptives [49–51]. In particular, gender attitudes are important in couples' decisions about acceptance and use of contraceptives. Since men remain important decision makers in contraceptive use, they should be adequately involved in population issues to increase their understanding hence support for contraceptive use [52]. Studies on gender norms indicate that perceived spousal disapproval of contraceptive use was enough to increase unmet need for contraception. Further, lack of communication between couples about their reproductive intentions has been linked with higher unmet need for contraception [53]. Negative gender attitudes among men have been reported elsewhere to restrict women's uptake of contraceptives, on the other hand, men with positive gender sensitive decision making skills were more likely to support contraceptive use [21]. In this study, some predictors of contraceptive use among sexually active men (such as communication with a health worker, number of living children, wealth status, education and marital status) have been observed in similar analysis of a male cohort in Uganda [32]. Health workers remain important in promoting contraceptive uptake by providing information that make couples make informed choices thereby resulting to contraceptive compliance [32]. Additionally, it has been reported that targeted communication by peer educators and health personnel have been positively associated with use of family planning among men [54].

In sum, findings from this study suggest that improving the socio-economic and demographic factors is essential. Family planning programs should at all times

Table 3 Odds ratio of modern contraceptive use among sexually active men in Kenya

Characteristics	Partner method vs. None/traditional method		Male method vs. None/traditional method		Partner method vs. None/ traditional method		Male method vs. None/traditional method		Partner method vs. None/ traditional method		Male method vs. None/traditional method		Partner method vs. None/ traditional method		Male method vs. None/traditional method	
Socio-demographic factors	Model I				Model II				Model III				Model IV				Model V	
Age																
15–24	1.00				1.00											
25–34	2.07	***	[1.60–2.68]	1.08	[0.90–1.30]											
35–54	1.66	***	[1.27–2.18]	0.80	[0.61–1.04]											
Residence																
Urban	1.00				1.00											
Rural	0.75	***	[0.64–0.88]	0.91	[0.76–1.09]											
Region																
Nairobi	1.00				1.00											
Central	0.12	***	[0.05–0.26]	0.18	***	[0.08–0.40]										
Coast	1.65	***	[1.23–2.19]	1.40	*	[1.00–1.95]										
Eastern	2.00	***	[1.47–2.72]	1.63	**	[1.18–2.26]										
Nyanza	1.10		[0.86–1.42]	1.32		[0.98–1.77]										
Rift valley	1.40		[1.00–1.96]	1.42	*	[1.01–2.00]										
Western	1.47		[1.11–1.95]	2.63	***	[1.92–3.62]										
North Eastern	1.71	*	[1.17–2.49]	1.98	***	[1.25–3.13]										
Marital status																
Never married	1.00				1.00											
Currently married	3.38	***	[2.56–4.47]	0.09	***	[0.07–0.12]										
Formerly married	1.48	*	[0.98–2.22]	0.61	***	[0.46–0.81]										
Religion																
Catholic	1.00				1.00											
Protestant	1.07		[0.90–1.28]	0.93		[0.78–1.14]										
Muslim	0.52	***	[0.36–0.77]	0.89		[0.60–1.32]										
No religion	0.38	**	[0.41–0.82]	0.74		[0.50–1.10]										
Age at first intercourse																
Less than 14 years	1.00				1.00											
14–17 years	0.94		[0.75–1.18]	0.97		[0.77–1.22]										
18–24 years	1.03		[0.81–1.31]	1.13		[0.89–1.44]										
25 and more years	0.68	*	[0.49–0.95]	0.76		[0.55–1.04]										

Table 3 Odds ratio of modern contraceptive use among sexually active men in Kenya *(Continued)*

Socio-economic factors																		
Wealth index																		
Low	1.00			1.00														
Medium	1.85	***	[1.57-2.19]	1.48	***	[1.23-1.78]												
High	2.10	***	[1.74-2.53]	1.39	**	[1.13-1.72]												
Education																		
None	1.00			1.00														
Primary	5.00	***	[3.18-7.85]	3.70	***	[2.30-5.94]												
Secondary/ Higher	6.19	***	[3.89-9.82]	5.57	***	[3.42-9.06]												
Currently working																		
No	1.00			1.00														
Yes	4.48	***	[3.16-6.35]	0.52	***	[0.42-0.64]												
Interaction with health system																		
Discussed FP with health worker																		
No							1.00			1.00								
Yes							1.71	***	[1.41-2.07]	0.84		[0.65-1.09]						
Behavioral/attitudinal factors																		
Fertility preference																		
Want another child													1.00			1.00		
Undecided													1.29		[0.81-2.05]	1.24		[0.65-2.37]
Want no more													1.31	***	[1.12-1.54]	1.10		[0.81-1.50]
No regular partner													0.39	***	[0.32-0.48]	11.87	***	[9.08-15.51]
Contraception is a woman's business																		
Disagree													1.00			1.00		
Agree													0.87		[0.71-1.06]	0.82		[0.65-1.04]
Don't know													0.18	**	[0.05-0.65]	0.35	***	[0.19-0.64]
Women who use contraception become promiscous																		
Disagree													1.00			1.00		
Agree													0.64	***	[0.55-0.74]	0.92		[0.76-1.10]
Don't know													0.58	**		0.83		[0.54-1.27]

Table 3 Odds ratio of modern contraceptive use among sexually active men in Kenya (Continued)

				[0.41-0.83]												
Number of sexual partners																
1partner			1.00			1.00										
2–5 partners			1.69	***	[1.34-2.14]	1.65	***	[1.28-2.12]								
6+ partners			1.93	***	[1.51-2.48]	1.72	***	[1.33-2.24]								
Access																
Frequency of reading newspaper/magazine																
Not at all									1.00			1.00				
Less than once a week									1.29	*	[1.06-1.57]	1.19		[0.96-1.47]		
At least once a week									1.63	***	[1.39-1.90]	1.24	*	[1.02-1.49]		
Frequency of listening to radio																
Not at all									1.00			1.00				
Less than once a week									1.46		[0.91-2.36]	1.83	**	[1.23-2.73]		
At least once a week									1.82	***	[1.26-2.65]	1.77	***	[1.25-2.50]		
Frequency of watching TV																
Not at all									1.00			1.00				
Less than once a week									1.39	**	[1.12-1.71]	1.45	**	[1.14-1.84]		
At least once a week									1.67	***	[1.37-2.04]	1.66	***	[1.35-2.04]		

*p < .05, **p < .01, ***p < .001

be inclusive and target both men and women in equal measure. Programs focusing on improving contraceptive use among men should consider utilizing multiple approaches to reach different segments of the male population. Integrating men in reproductive health issues will lead to greater uptake of contraceptives and also break the power dynamics and gender norms that discourage contraceptive uptake. DHS surveys can provide more information on the participation of men in reproductive health issues by including more topics around men's health, access to care, social support and fertility desires. Like most cross-sectional surveys, the major limitation of this study in the ability to draw reliable measures of modern contraceptive use may be limited by the nature of information reported at the time of interview. It is therefore not possible to draw robust conclusions on the influence of various background factors on modern contraceptive use. However, despite this shortcoming, the paper provides an interesting contribution to the debate on the role of men in family planning, an area that has not been fully explored in the Kenyan context.

Conclusions

The findings presented here moved beyond the traditional DHS analysis of modelling contraceptive use among women. We considered factors contributing to modern contraceptive use among sexually active men, namely the extent to which different explanatory variables affected the use of modern contraceptives. Men who had no education had a low degree of contraceptive awareness and were less likely to use modern contraceptives. This group of men seemed not to be properly informed about contraceptives as well as their benefits. Men from North-Eastern Kenya appeared to lag far behind other regions with uptake of modern contraceptives. Religion and gender attitudes also seem to shape behavior and practice on contraceptive use among men from North-Eastern Kenya. Our analyses suggest that interpersonal communication and mass media have a positive effect on modern contraceptive use. Provider–client interaction as well as dissemination of information through mass media could facilitate the dissemination of information and potentially increase knowledge and uptake of modern contraceptives. Similar efforts should focus on mass family planning sensitization campaigns targeting key sectors of the population where uptake of modern contraceptives remains low.

Abbreviations

CPR: Contraceptive prevalence rate; DHS: Demographic and health survey; HIV/AIDS: Human immunodeficiency virus/Acquired immuno-deficiency syndrome; KDHS: Kenya demographic and health survey; TV: Television

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Availability of data and materials

Complete data is available at http://dhsprogram.com/data/available-datasets.cfm.

Authors' contributions

RO Participated in the overall conceptualization and inception of the idea of this manuscript, with lead roles in conducting literature review, data analysis, writing the results and discussion sections. MM wrote the background section and reviewed the manuscript. MT and IA provided overall guidance in writing the background, methodology, analysis, and review of the manuscript with particular attention on how it adds to the body of literature in Kenya. All authors read and approved the final manuscript.

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Competing interests

The authors declare that they have no competing interests.

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CHAPTER FIVE

Discussion

This chapter discusses findings from six articles that address the objectives of the study: i). to get insights into the prevalence and predictors of contraceptive use among vulnerable populations, ii). to study barriers to contraceptive use among vulnerable populations; and iii). to formulate recommendations to improve contraceptive use among vulnerable populations. We aim at formulating recommendations around contraceptive use among vulnerable populations based on the research projects presented to influence policies, and practices to increase contraceptive use. This chapter also presents a discussion of the findings in relation to other studies conducted in similar settings.

Discussion

Effective contraception has been proven to have both health and social benefits for mothers, their children and households in general. Family planning helps prevent unintended pregnancy, thereby preventing deaths to mothers and their children, it also helps reduce the need for abortion, especially unsafe abortion, family planning methods such as condoms help prevent the transmission of STIs including HIV. Family planning also gives couples an opportunity to determine the number, and spacing for their children. Closely spaced births are likely to result to infant mortality, and children whose mothers die during child birth are more likely to experience mortality due to poor health [158, 159].

Family Planning has been shown to manage rapid population growth by preventing unwanted pregnancies while reducing maternal and child mortality and improving the health and wellbeing of families and communities. Additionally, family planning helps women and families to invest in quality children and their future, achieve developmental goals for health, gender equality, and environmental sustainability, including Kenya's vision 2030 and the SDGs [160]. The United Nations estimates that every dollar spent on family planning saves between $2 to $6 in interventions aimed at achieving other development goals. When combined with progressive development policies, family planning reduces poverty and stimulates economic growth [3].

Prevalence and predictors of contraceptive use among vulnerable populations

Our findings show that contraceptive use among vulnerable populations is determined by 1) the experience of unintended

pregnancy, 2) living in resource poor settings, 3) engaging in female sex work, 4) being a young woman, 5) migration, and 6) male influence. Our study on unintended pregnancy among women living in resource poor settings indicate a lower prevalence of unintended pregnancy, 24%, compared to the national prevalence of 29% reported by KDHS 2008/09 conducted almost the same time of our survey. The contraceptive prevalence of 48% was also almost comparable to that of Nairobi, 49% from the 2008-09 KDHS [62]. However, it is worth noting that majority of the women who reported unintended pregnancy were higher parity women, an indicator for unmet need for family planning to limit the number of children. It could also be a sign of lack of access to long-term methods which offer better protection to women who wish to stop child bearing. Unintended pregnancy is an indicator of flaws in the reproductive health care system. Flaws in the health care system point to gaps at the structural level, which involve health service delivery outlets that fail to meet the needs of women by availing long-term methods which offer better protection for limiting the number of children. Women who experience unintended pregnancy are reported to be non-users of contraceptives and those who do, use them incorrectly, however, some lack access to contraceptives altogether [161-164]. Women with unmet need for modern contraceptives account for 84% of all unintended pregnancies in developing countries, of these, those not using contraceptives account for 70% of unintended pregnancies and those using traditional methods account for 10% [3].

We also learn that the experience on unintended pregnancy made the women aware of the risk they faced and this acted as a trigger to use family planning to prevent the occurrence of future unintended pregnancies. This is a demonstration of individual level factors that trigger risk perception thereby increasing contraceptive use among women who have had a previous experience of unintended pregnancy. Many studies have highlighted the risks associated with unintended pregnancy, yet, few have documented the fact that the experience of unintended pregnancy can increase risk perception thereby trigger contraceptive use among women who were not previously using contraceptives to prevent another episode of unintended pregnancy [87, 165-168].

Women living in resource poor settings face various challenges with contraceptive use. Our findings show that contraceptive prevalence for modern methods was 38% while the national average at the time of the survey was 46% [62]. This is an indication of the greater disadvantages that women living in resource poor settings face that go beyond individual level factors, and include structural level factors involving service delivery outlets that are unable to provide a wide range of contraceptive methods to the women. Additionally, only 6.4% of these women reported use of long-term methods. Despite the fact that long-term methods are more effective in pregnancy prevention, have fewer side effects, and are less user dependent than the short-term methods, their use remains low [169].

Majority of women in resource poor settings such as slums report high levels of unintended pregnancy yet they are unlikely to use long-

acting methods of family planning. Long-acting reversible contraceptives (LARCs), such as IUDs and implants, are methods that are highly effective in preventing unintended pregnancies for a long period of time. LARCs do not require constant user action, thereby minimizing the possibility of inconsistent or incorrect use [170]. However, the use of LARC remains low especially among our study population. Factors that have been cited to influence choice of a contraceptive method include individual level factors such as awareness, perceptions on their effectiveness and safety. Myths and misconceptions about LARC mode of operation also negatively influence their adoption as a preferred method, these are mostly propagated by members of the society and social network who contribute to the interpersonal level factors in the social analysis framework [171-173].

Urbanization has led to movement of people to urban areas, most of who end in resource poor settings, urban slums. Yet, such settings are under served by formal services including family planning an indication of gaps in the structural level which consists of institutions that offer service delivery such as health facilities. Thus, some residents are forced to travel long distances in search of services. Travel time and cost maybe incurred acting as a barrier to use. Poverty, another characteristic among the urban poor is a major barrier to contraceptive use. According the 2014 Kenya DHS, twice as many poor women have unmet need for family planning compared to women from middle and wealthy income households [66]. The growing urban poverty in Kenya has led to a deterioration in the health

outcomes for the urban poor. More so, lack of access to reproductive health services in resource poor settings has resulted to high unmet need for family planning resulting in an increasing number of unintended pregnancies [88, 174]. Lack of contraceptive commodities in the government health facilities, user fee for contraceptives by private health providers in resource poor settings and poor quality services or poorly trained providers are structural level factors which hinder access to FP services. Moreover, financial problems are experiences by most residents of informal settlements and many have to make a choice of getting basic needs such as food, rent, water and contraceptives [89].

Women who internally migrate within Kenya, whether from rural to urban or between urban centres, were more likely to use modern contraception than women living permanently in rural areas. This is due to the characteristics of the internal migrants which form part of the individual level attributes such as higher levels of education, later age at marriage, participation in employment, among other things that gave them greater advantage in terms of contraceptive access and use [107]. The role of migration has been explored widely, however, few studies have focused on how migration affects access to health services particularly among migrant women. Globally, it is estimated that over 90% of the population will be urban by 2030 as a result of rural-urban migration [175]. The escalating movement to urban areas has led to emerging and growing challenge of urban poverty and mushrooming of slum settlements [89]. Studies have confirmed that women living in slums are at a greater risk of early sexual debut, a

leading cause of unintended pregnancy [176]. Migrants are also more likely to have higher levels of unemployment, lower income, higher risk of poverty and social exclusion. Lower socioeconomic status and poverty are known to be associated with poor health outcomes [177].

We also find that men have a strong influence on their partners on contraceptive use, this is the interpersonal level influence which can either be positive or negative. Although men influence their partners contraceptive practice, they have by and large been sidelined by many family planning programmes. Men who promote family planning use are those with the following individual level attributes; higher levels of education, in employment, live in urban areas, currently married and have access to the media in the form of readership of newspapers or magazines, radio and television listenership [107]. The focus on women and neglect of men has led to setback in FP uptake and disadvantaged both men and women. While men are less knowledgeable, they are less reluctant to show their ignorance on reproductive health related issues [178]. Men play a dominant role in majority of households in the low-income countries. The influence men have on women extends way back in the mid-1970s when it was reported by the Danfa project that men exert influence on their partners to stop using family planning methods. However, the project found that health care services set up were more appropriate to women and children, leaving out men. Existing evidence from door-to-door family planning services have confirmed that educating men about family planning can enhance their participation by increasing their capacity to make informed choices which have beneficial

outcomes [179, 180]. However, those opposed to male involvement argue that women should not lose their right to control their own body by making their own reproductive decisions. Men therefore should be brought on board when women themselves want the men to either accompany them for counseling sessions or during the provision of other services [178].

It is widely argued that that research on reproductive health has tended to focus on women without addressing the role of masculinity in contributing to gender inequities, and in putting men and their partners at risk [181]. Family planning programmes that have 'selectively accommodated rather than challenged prevailing gender norms' through targeting family planning towards women, have 'reinforced the idea that reproduction and family welfare are women's responsibilities' [40]. Elsewhere, a study conducted in DRC found that women gave a major barrier to contraceptive use as resistance from their male partner [182]. Lack of male interest in reproductive health issues further heightens the problem of their approval of family planning [183]. In Ghana, even though majority of the women accepted family planning, permission from their male partners was necessary before uptake of a modern method. These findings confirm the important role men play in family planning approval or disapproval which ultimately influences use [184]. Therefore, applying a gender perspective on family planning programmes including men and masculinities helps meet the health needs and rights of both men and women.

Barriers to contraceptive use among vulnerable populations

Female sex workers face numerous challenges in accessing contraceptives that prevent both unintended pregnancy and HIV/AIDS. Our study report low contraceptive use among FSW and their partners because they interfere with their work. Non-barrier methods such as injectables were reported to cause dizziness, nausea and continuous bleeding therefore not suitable for their kind of work. On the other hand, they report violence, and lack of negotiation skills with paying clients who sometimes refuse condom use by promising to pay more for non-use of condoms, or reduce the pay when the FSW insists on condom use. These factors emphasize limitations in the individual level attributes which leaves the FSW vulnerable to the demands of their clients. Elsewhere, low contraceptive use was reported to expose FSW to unwanted pregnancy and STIs. FSW are more concerned about unwanted pregnancy than acquiring an STI. However, available evidence show that condom use for FSW is high only when in contact with casual paying clients [141, 185, 186]. A study conducted among FSW in Ethiopia recommended continuous counseling on safer sex and consistent condom use in addition to use of other effective family planning methods as higher numbers of unwanted pregnancy which resulted in abortion was reported among this group [187]. While it is common knowledge that greater attention is required to meet contraceptive needs of FSW, various challenges exist restricting their access to family planning services. For instance, FSW living with HIV are stigmatized by health care providers through stigma and discrimination, service refusals, abusive treatment and inadequate or inappropriate provision of care. FSW in Afghanistan

avoid health facilities for fear of being reported to the police, while a survey conducted in six Asian countries reported that about 42% of women living with HIV reported finding it difficult to find a gynaecologist to care for them during pregnancy due to their status while another 18% were not satisfied with the care received. Such bias act as a barriers to health care services utilization by FSW whose needs are not catered for in the formal health care systems [188].

In Rwanda, a study assessing contraceptive needs of FSW found them to be reluctant to use LARC methods due to side effects and misconceptions, however the non-users reported they would consider use in future due to influence from health care providers (52%), and friends (36%) [189]. Health care providers therefore remain important in encouraging contraceptive use as long as FSW open up and share their experiences and nature of their work. Most of the time, as reported by FSW in Kenya, Mozambique, South Africa, and India, they do not report the nature of their work due to health service related barriers such as stigma and discrimination by providers, long waiting time for services, inconvenient opening hours, complicated referral procedures, and administrative requirements such as bringing sexual partner before treatment of STIs which increase barriers for service access [190].

Our findings on the study among young urban women demonstrate that contraceptive knowledge does not necessarily translate to use, while majority of the young urban women reported knowing at least one modern method of contraception, some remained non-users. This further emphasizes the role of individual level factors that lead to

prejudices that negatively influence contraceptive uptake. Additionally, our findings show that contraceptive use among young urban women is influenced by barriers such as fear of side effects sometimes based on myths and misconceptions, influence from social network and peer approval which stress the role of interpersonal level factors on the individual [107]. Young women are of concern to reproductive health researchers and program planners because they are just beginning their reproductive lives and laying the foundation for their future. Helping these women avoid unintended pregnancies can have far-reaching benefits for the women, their future children and societies. Postponing childbirth allows young women to finish their education, seek employment and have a birth at the healthiest time of their lives. Young women face social, cultural and economic barriers in obtaining and using contraceptives. Sometimes, there is pressure to have a birth soon after getting married, and single sexually active women may believe that using a method would call attention to their socially stigmatized behavior [191].

Data from DHS in 52 countries shows that young women aged 15-24 years are more likely to have an unmet need for contraception than those aged 25-49 years. These data include all married women and sexually active unmarried women who want to avoid a pregnancy. Some of the difference in unmet need between younger and older women is since sexually active never-married women fall predominantly in the younger group, and they have much higher unmet need than do older, married women. Further, married young women aged 15-24 years have somewhat higher unmet need for

contraception than their older counterparts. This is because they shy away from health facilities as providers think they are too young to be mothers, yet they may not fit in the youth friendly centers that offer contraception because they are mothers [38, 192].

In addition, women aged 15-19 years, whether married or not, consistently have higher unmet need than women aged 20–24. Although women of different ages face different personal circumstances, the reasons they cite for not using contraception or not wanting a pregnancy are similar. Four reasons are most common: infrequent or no sex (even though they are categorized as sexually active); postpartum amenorrhea (not having resumed menstruation after a birth), breast-feeding or both; opposition to contraception (by the woman or someone close to her); and concern about the methods themselves - their side effects, health risks or inconvenience. Among young women who want to avoid a pregnancy, 11% say they are not using a method because they are "not in a union/married," and fewer women report being unaware of contraception, lacking access to a source, or being sub-fecund or infecund. More often, young women cite being unmarried as a reason for non-use than older counterparts, possibly reflecting sporadic sexual relationships (especially those who are unmarried) among young women. Similarly, a belief that contraceptives are inappropriate may expose their illicit activity can be a barrier for use. Women aged 15-24 cite "infrequent or no sex" as a reason for non-use slightly more often than older women (29% compared to 25%, respectively), most likely reflecting the fact that young women with unmet need are unmarried and have more

sporadic sexual relationships than married women. An exception to this pattern is documented in the Philippines, where older women are more likely to cite infrequent sex as a reason than younger women (40% vs. 28%, respectively). On average, younger women are more likely than their older peers to report postpartum amenorrhea, breast-feeding or both as a reason for nonuse - probably reflecting that births occur more often among the younger age groups especially in Africa. However, these differences are small [191].

Although opposition to contraceptive use is still a major reason for non-use for both younger and older women, more older women are more likely to oppose contraceptive use. Fewer younger women with unmet need cite concerns about side effects and health risks compared to older women - 21% versus 29%, respectively (Ref). This gap, between age-groups, is more than 10 percentage points in Bolivia, Guyana, Haiti, Congo, Kenya, Lesotho, Madagascar, Nigeria, Tanzania and Zambia. Given the contraceptive prevalence rates in these countries, the results could point to fewer younger women who have tried a method and experienced side effects. However, these concerns remain common among women of all ages and merit greater attention [191, 193].

All young women need correct information about the risk of becoming pregnant and contraceptive methods available and most suitable for their needs. An obvious area for improvement is counseling during family planning and other health services that serve the needs of young women. However, these services should also be available in places such as youth friendly centers where young people are likely to

frequent [38]. Health care providers attitudes have been reported to affect uptake of services. In particular, provider bias may influence contraceptive uptake when personal biases lead to promotion of specific methods. This bias may extend to population groups where women a particular race are counseled for contraceptive as opposed to others. For instance, a study found Black and Hispanic women being more likely to report having received counseling about birth control than White women, further, Hispanic women were more likely to be counseled about sterilization [194, 195].

Limitations

A number of data limitations exist and these should be considered at the time of interpreting the results. First, the ability to derive reliable measures of contraceptive use may be limited by the nature of information reported by respondents at the time of the interview. Similarly, it is not possible to draw robust conclusions on the influence of the identified barriers and predictors of contraceptive use in the DHS due to relative temporality of cross-sectional studies. For instance, a dependent variable may have preceded an explanatory factor, like contraceptive use or non-use occurring prior to achievement of current educational attainment. The cross-sectional nature of the data limits causation analysis. Findings will indicate associations rather than causality between outcome variable and independent variables. It is also true that some of the information used in the analysis is collected at the time of the survey rather than the time of decision to use (e.g. education, residence, etc.). In addition, where DHS data is applicable, estimates for small geographic areas are

not available due to the sample sizes not being large enough. This prevents the provision of the much-needed evidence for monitoring and evaluating programs in small locations (e.g. districts or sub-counties). Self-reported information may also be subject to recall bias, probably altering the accuracy of the data used.

A major limitation, which also applies to most investigations on unwanted fertility, is the difficulty to accurately capture the very concept of unintended pregnancy, as a number of authors have reported a tendency of women to revise the status of a pregnancy after birth [196, 197]. Further, due to the small sample sizes (Study in Article 2), we combined mistimed and unwanted pregnancies, and considered their joint influence on contraceptive use. As acknowledged by D'Angelo et al., mistimed pregnancies and unwanted pregnancies may have different consequences and may affect subsequent use of contraception differently [198]. Another limitation of the analysis is related to the possibility that a woman may change her decision to use or not to use a contraceptive method more than once during the period between the birth of her last child or the termination of her last pregnancy, and the time of the interview. We sought to address this last issue using a multivariate model that controls for the length of time since the last birth or last pregnancy termination. Also, there may be a bi-directional relationship between unintended pregnancy and contraceptive use, with unobserved factors affecting both unintended pregnancy and contraceptive use. Our qualitative investigation sought to shed light on the specific influence of unintended pregnancy on future contraceptive use. Finally, another

limitation is with regard to use of qualitative data whose findings cannot be generalized beyond the study area.

Results from the qualitative studies cannot be generalized to other settings, therefore, our findings may only be applicable to the settings where the qualitative studies were conducted. On the other hand, there is limited data on male involvement in family planning and a lot more studies should be conducted among men to understand their concerns and provide a range of factors to help carry out further analysis to establish other factors that influence of family planning among men and their partners.

CHAPTER SIX

Recommendations

This chapter provides recommendations around contraceptive use among vulnerable populations based on the research projects presented to influence policies, and practices to increase contraceptive use. It is evident that vulnerable populations need more attention to promote contraceptive use among them. This calls for more awareness on the available contraceptive options that they can utilize, additionally, as informed by our findings, there is need to make recommendations to policy makers, health care providers, programmers and for further research to understand how best to meet the needs of vulnerable populations to enhance uptake and sustained use of modern contraceptives.

Recommendations to Policy makers

- The Ministry of health and education should formulate policies on comprehensive sexuality education that includes information on contraception to help young women understand the benefits of contraception in helping prevent unintended pregnancy
- The government of Kenya should facilitate the set-up of community-based distribution centers where reproductive health services and information can be obtained by the majority of the population. FSWs report health facility related barriers such as inconvenient opening hours which make contraceptives inaccessible to them, bringing them closer to them would eliminate such barriers and increase use
- The government should come up with policies that promote continuous education among health care providers to equip them with the relevant skills to be able to address the changing reproductive health needs of the population especially those of vulnerable populations such as FSW who may present with special reproductive health needs
- The government should promote the setup of youth friendly centers which are accessible to young woman to promote contraceptive use in an environment that is friendly and more acceptable. This will meet the needs of young women whose needs are not well addressed in the regular family planning clinics which are friendlier to the needs of older women

Recommendations to health care providers

- The experience of unintended pregnancy is an indication that a woman did not use protection to prevent a pregnancy which could be due to several factors such as access, or individual level factors such as level of education, and awareness. Health care providers should not just offer contraception but try to find out during counseling if the woman has ever experienced unintended pregnancy then recommend more effective contraceptive options to avoid the occurrence of another unintended pregnancy
- Health care providers should integrate family planning counseling, services, and follow-up into postpartum programs. Additionally, other services that offer an opportunity to reach women such as post-abortion care, child survival programs, community health programs, and HIV services among others should be used to target women for family planning
- Health care providers should come up with innovative ways of ensuring family planning services are more accommodative to the needs of men to encourage them to accompany their partners or visit the family planning clinics for information and use of family planning
- Health service related barriers should be minimized by training providers to offer services without discrimination especially for key populations such as FSW who may have special reproductive health needs

Recommendations for programming

- Our findings demonstrate that the main barriers to modern contraceptive uptake among young women in Kenya are myths and misconceptions, with both users and non-users exhibiting lack of accurate information on different contraceptive methods. These findings emphasize the need for family planning programmes to develop innovative strategies to overcome myths and rumours which negatively influence uptake and sustained use
- To reach the younger segments of the population, programmers should begin to use newer approaches such as the social media to target this audience by sharing accurate information to create demand for modern contraceptives among by addressing any information gaps and misinformation
- Due to urbanization, women who move to urban areas are likely to settle in informal settlements where access to reproductive health services is limited. This calls for interventions to increase access to reproductive health services to meet the needs of the growing urban population

Recommendations for research

- Myths and misconceptions around contraceptive use can be better addressed by researching the influence of social elements such as shame, monotheistic religion, social status, and distrust in government interventions on contraceptive use
- We suggest further research to understand the role of men as influencers of decisions on contraceptive use, also more

research should be conducted to better understand how to encourage the active participation on men on family planning use and promotion.

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