Demographic Factors affecting Dual Contraception Preference among Seropositive Women in Discordant Relationships in Nyatike Sub-County, Kenya

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Abstract

Dual contraception is an effective strategy of achieving zero HIV transmission and unwanted pregnancy among discordant couples. Despite the double benefit, dual contraception use is still limited among seropositive women particularly in Nyatike Sub County, Kenya. Further, no research had been done on dual contraception preference or use among discordant couples in Nyatike Sub County. To fill this gap, this study aimed to establish the relationship between socio-demographic factors including age, parity, level of education, monthly income and dual contraception preference among seropositive women in discordant marital relationships in Nyatike Sub- County of Migori County, Kenya. This was a facility-based cross-sectional study in fourteen health facilities in Nyatike Sub- County. It involved 188 randomly sampled seropositive women in discordant marital relationships, 14 seronegative men randomly sampled and 14 healthcare providers. Descriptive statistics and chi-square test were used to analyze quantitative data while qualitative data were analyzed using content analysis. The study revealed that Parity (p=.001), level of education (p=.003) and monthly income (p=.026) were statistically significantly associated with dual contraception preference while age (p=.051) was not. The study recommends sensitization of seropositive women on the benefits of dual contraception to increase uptake of dual contraception.

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Keywords: Seropositive Women, Dual Contraception, Dual Contraception Preference, Unplanned Pregnancy, HIV Infections

Introduction

The contraceptive use is complex among discordant couples who are troubled with preventing both unintended pregnancy and HIV transmission to uninfected partner. International reproductive guidelines that encouraged avoidance of pregnancy among discordant couples now recommend conception and parenting (Mathews, *et al*., 2011; Izugbara *et al.,* 2018). In this regard, Word Health Organization has recommended dual contraception use among discordant couples to limit unwanted pregnancy and HIV transmission to uninfected partner (Munsakul *et al*., 2016). However, its use remains a challenge because contraceptives effective in preventing pregnancy and HIV transmission are female and male controlled respectively. To mitigate this challenge, researches have recommended partner communication to enhance dual contraception use (Gebrehiwot *et al.,* 2017; Abay *et al.,* 2020). Conversely, such partner communication is still limited due to partner disapproval (Mulongo *et al.,* 2017; Jean *et al.,* 2022).

This has resulted in low dual contraception prevalence rate globally among married women. Studies in USA and Europe have shown an average low dual contraception prevalence of 15% and 22.5% respectively (Brown, *et al.,* 2011; Eisenberg, *et al.,* 2012; Higgins and Cooper, 2012). Comparatively, a study in Canada and Thailand has shown slightly higher dual contraception prevalence of 27% and 29.6% respectively among married women (Patterson *et al*., 2014; Munsakul *et al.,* 2016).

In Sub-Saharan Africa, a region hit hard with HIV pandemic, low dual contraception use among seropositive women is evident. Studies in Nigeria, Namibia, Ethiopia and Rwanda have found dual contraceptive prevalence of 27.2%, 34%, 15.7% and 40% among seropositive women respectively (Lewani *et al.,* 2014; Antelman *et al.,* 2015; Gebrehiwot 2017; Jean *et al.,* 2022). Seropositive women on antiretroviral therapy still report low dual contraceptive prevalence despite HIV status disclosure. Recent Ethiopian studies among this population indicate low dual contraception prevalence at 28.8%, 21.8% and 56.9% (Abay *et al.,* 2020; Jemberie *et al.,* 2023, Bendecha *et al.,* 2023). The situation is similar in Kenya where dual contraception prevalence of 28% and 38.5% has been noted among seropositive women (Antelman *et al.,* 2015; Mulongo *et al.,* 2017). This has resulted in new HIV infections and unwanted pregnancy among discordant couples who, as result of socio-cultural pressure and the use of ART continue to give birth in an environment with limited integration of family planning and HIV services (Chakrapani *et al.,* 2011; Gebrehiwot *et al.,* 2017).

Besides partner discussion and approval, low dual contraception prevalence rate is a product of interplay of socio-demographic characteristics such as age, parity, level of education and levels of income of seropositive women (Munsakul *et al.,* 2016; Mulongo *et al.,* 2017; Ayele *et al.,* 2020). These socio-demographic characteristics, though very important determinants of dual contraception use, have attracted little attention from scientific researches (Stephenson *et al*., 2011). Surprisingly, no research on dual contraception exists in Nyatike Sub-county, Kenya particularly with regard to how socio-demographic characteristics of seropositive women in discordant relationships affect their preference for dual contraception.

Study Objective

To establish the relationship between demographic factors (age, parity, level of education and level of income) and dual contraception preference among seropositive women in discordant marital relationships in Nyatike Sub-County.

Scope and Limitations of The Study

The study was limited to establishing the relationship between demographic factors (age, parity, level of education and level of income) and dual contraceptive preference. Further, it was limited to fourteen health facilities in Nyatike Sub-county, Kenya. The target population was seropositive women aged 18-49 years in discordant marital relationship, the conventional reproductive period for women. Fourteen seronegative men were included because men are the dominant decision makers on reproductive health. It also involved fourteen health care providers to provide expert information.

Literature Review

Introduction

This chapter explored the literature on the effect of age, parity, level of education and levels of income on dual contraception preference among seropositive women in discordant marital relationships.

Age and Dual Contraception Preference

Researchers have shown mixed results on the relationship between age and dual contraception use. Studies have noted that younger age increases odds of dual contraception use in Australia and USA (Parr and Siedlecky, 2007; Eisenberg, 2012; Higgins and Cooper, 2012). On the contrary, a study in Canada and Thailand found that seropositive women reporting high use of dual contraception were older with higher parity (Patterson *et al*., 2014; Munsakul *et al.,* 2016), perhaps indicating that older women have achieved their desired parity thus focused on preventing pregnancy. In Sub-Saharan Africa, effect of age on dual contraception use has shown a mixed result. Whereas some studies show that younger seropositive women report high use of dual contraception (Moroni *et al.,* 2007; Antelman *et al.,* 2015; Gebrehiwot *et al.,* 2017), a study in Ethiopia and Uganda indicated otherwise (Abay *et al.,* 2020; Bongomin *et al.,* 2023) These previous studies focused on use but not preference for dual contraception and were based on seropositive women without a clear distinction of those in discordant relationships. Research on how age of seropositive women in discordant relationship affects their preference for dual contraception in Nyatike Sub-county was thus vital because it was non-existent.

Parity and Dual Contraception Preference

Studies have shown that women of high parity have high contraceptive prevalence rate compared to those having low parity because of their desire to stop births (Oni *et al*., 2013; Haddad *et al.,* 2015; Bongomin *et al.,* 2018)**.** Further, few studies that have correlated parity and dual contraception use have given mixed results. Whereas low parity was noted to decrease odds of dual contraception use among seropositive women in Canada (Patterson *et al.* 2014), Ethiopia (Jemberie *et al.,* 2023) and Kenya (Antelman *et al.* 2015), other studies in Ethiopia and Rwanda found that low parity increased odds of dual contraception use among seropositive women (Gebrehiwot *et al.,* 2017; Jean *et al.,* 2022). The studies however did not

correlate parity with dual contraception preference among seropositive women in discordant marital relationships, the knowledge gap this study intended to fill.

Level of Education and Dual Contraceptive Preference

Generally, studies have shown a significant positive association between level of education and contraceptive use (Nwosu *et al*., 2011; Esabella, 2012). A study in Tanzania (Damian *et al.*, 2018) and Uganda (Bongomin *et al.,* 2018) indicates that higher levels of education increase odds of contraceptive utilization. A review of literature on the effect of education on dual contraception preference has shown contradicting results. Studies in Thailand (Munsakul *et al.*, 2016), South Africa (Moroni *et al*., 2007), Namibia, Tanzania and Kenya (Antelman *et al.* 2015), Uganda (Bongomin *et al.,* 2023) found no relationship between level of education and dual contraception use among seropositive women. On the contrary higher levels of education has been noted to increase odds of dual contraception use among seropositive women in Ethiopia, Rwanda and Kenya (Teklu and Davey, 2008; Gebrehiwot *et al.*, 2017; Mulongo *et al.*, 2017; Abay *et al.*, 2020; Jean *et al.*, 2022).

These studies focused on effect of education on dual contraception use among seropositive women but failed to address its effect on dual contraception preference among seropositive women in discordant relationships. This vital information was equally non-existent in Nyatike Sub- County, necessitating research.

Monthly Income Levels and Dual Contraceptive Preference

Low cost and proximity of services motivates women to use modern contraceptives (Kayongo, 2013), while high transport cost to distant health facilities and opportunity cost of time spent away from income generating activities lessen contraceptive use (Karra and Lee, 2012; Kayongo, 2013). Contrary to the findings that severe decline in household income resulted in a small increase in proportion of couples using contraceptives in Indonesia (Karra and Lee, 2012), studies in Tanzania (Damian *et al.*, 2018) and Uganda (Bongomin *et al.*, 2018) have found positive correlation between monthly income with contraceptive use among seropositive women.

Studies that have associated contraceptive use with income levels have focused only on single methods (Gikaduo and Vyena 2015; Dias and Oliveira 2015; Damian *et al.*, 2018; Bongomin *et al.*, 2018). A focus on the correlation of monthly income levels and dual contraception preference among seropositive women in discordant relationships was missing. This study therefore intended to establish this correlation.

Methodology

Study Design

This was a facility-based cross-sectional study in fourteen health facilities in Nyatike Sub-county of Migori County, Kenya.

Sample Selection and Size

Sample Selection

Purposive sampling was used to sample fourteen health facilities based on patient volume. Two facilities with the highest number of seropositive women in each of the seven wards of Nyatike Sub-county formed

part of the study and were allocated 13 participants each for quantitative data. Random sampling was then used to sample seropositive women in discordant marital relationship for at least 6 months prior to study, aged between 18-49 years, attending the selected health facilities, willing to participate in the study and able to give informed consent. Fourteen seropositive women for FGDs and fourteen health providers (Key Informants) for in-depth interviews were purposively sampled. Random sampling was further used to select 14 seronegative men in discordant marital relationships, aged 18-59 years and attending selected health care facilities. Both FGDs and in-depth interview creates good rapport between the researcher and the respondents (Strauss and Corbin, 1999), thus respondents were motivated to freely provide true information.

Sample Size

The study considered a sample size of 182 seropositive women in discordant marital relationships among 344 target population in Nyatike Sub-county for quantitative data. This sample size was estimated using Fisher's formula, $n= (Nz^2pq)/e^2 (N-1) + z^2pq$

(1988) (Kothari, 2004). For qualitative data, fourteen seropositive women in discordant marital relationships participated in Focused Group Discussions while fourteen seronegative men in discordant marital relationships and fourteen health care providers were subjected to in-depth interviews.

Study Variables

The independent variables were age, parity, level of education and monthly income while the dependent variable was self-reported dual contraception preference.

Data Collection Instruments

Semi-structured questionnaire was used to collect quantitative data while FGD and in-depth interview guide was used to collect qualitative data. These methods involved face-to-face interaction with respondents thus helped in getting in-depth information.

Data Collection Procedures

Fourteen persons with long experience in working with HIV infected individuals were recruited (one for each health facility) and trained as research assistants. They interviewed sampled seropositive women during the routine health facility visits. In-depth interviews with sampled seronegative men and health care providers as well as two Focused Group Discussions involving fourteen seropositive women were conducted by the researcher himself and notes taken. The study participants were identified by health providers in collaboration with research assistants.

Data Analysis

Descriptive statistics was employed in quantitative data analysis where crosstabs were used to cross-tabulate predictor and outcome variables to describe the data proportionally. Inferential statistics involving Chi-square test was further used to test the relationship between the predictor and outcome variables and a probability value of <0.05 considered significant.

On the other hand, content analysis was employed to analyze qualitative data obtained from Focused Group Discussions and In-depth Interviews. Because of its flexibility, content analysis helped in making descriptions and interpretations of the content of text data based on study objectives. Tables were then used to present quantitative data analysis results while thematic descriptions were used to present qualitative data through content analysis.

Ethical Principles

Permission to carry out the research was obtained from the board of post graduate studies of Rongo University. A research permit was then sought from the National Commission for Science, Technology and Innovation (NACOSTI). Permission to carry out research within the Sub-county was obtained from County Commissioner, Migori County; County Director of Education, Migori County; Sub-county Commissioner, Nyatike; MoH Nyatike Sub-county, and administrative authorities of the sampled health care facilities. Trained research assistants obtained individual written informed consent from respondents prior to their involvement in data collection. Responses given by the respondents were treated with utmost confidentiality and participant anonymity was ensured. Participation by the respondents was voluntary and none was coerced to answer any question.

Study Findings and Discussions

Response Return Rate.

Out of the 182 seropositive women sampled, 174 (95.6 %) were interviewed while 8 (4.4%) later refused to take part in the study citing privacy**.**

Background Characteristics of the Respondents

Of the 174 seropositive women surveyed, majority 85 (48.9%) were aged between 18-29 years followed by those aged between 30-39 years 64 (36.8%), an indication of a possible high prevalence of HIV discordance among younger women. Most 82 (47.1%) had either two or three children followed by those who had four or more children 51 (29.3%). Whereas majority 113(64.9%) had primary education, this number steadily decreased though secondary 32(18.4%), to tertiary 15(8.6%), perhaps a reflection of high drop-out rates in the study area. Over 62% of respondents earned not more than Ksh.5000 a month indicating low socio-economic status in the study area. Table 1 summarizes the background characteristics of respondents.

Table 1: Background Characteristics of Respondents (n = 174)

Variables		Frequency (n)	Percent (%)
Age	18-29	85	48.9
	30-39	64	36.8
	40-49	25	14.4
Number of children	0-1	41	23.6
	2-3	82	47.1
	≥4	51	29.3
	None	14	8.0

Level of Education	Primary	113	64.9
	Secondary	32	18.4
	Tertiary	15	8.6
Level of Monthly Income	Ksh.0 - 5,000	108	62.1
	Ksh.5,001- 10,000	43	24.7
	Over Ksh.10,000	23	13.2

Source: Field Survey, 2017

Age and Dual Contraception Preference

An evaluation of the cross tabulated results of age versus dual contraception preference revealed that across the age categories, the proportion who preferred to use dual contraception were notably higher than the proportion who did not except for age group 40-49 years as can be seen from Table 2.

Table 2: Cross-Tabulation of Age and Dual Contraception Preference

Age	Dual Contraception Preference			
	Yes		No	
	Frequency	Percent (%)	Frequency	Percent (%)
18-29	61	71.80	24	28.20
30-39	37	57.80	27	42.20
40-49	12	48.00	13	52.00
Total	110	63.20	64	36.80

0 cells (0.0%) have expected count less than 5. $X^2 = 5.964$; df=2; p=0.051,
N=174. No missing case. Test statistically significant at $p < 0.05$.
Source: Field Survey, 2017

The proportion of seropositive women who preferred using dual contraception was highest among those aged between 18-29 years (71.8%), followed by those aged between 30-39 years (57.8%), and finally least among those aged between 40-49 years (48.0%). Further analysis of the crosstab table reveals that seropositive woman aged 18-29 years had the highest odds of preference for dual contraception 61/24 = 2.542 followed by those aged 30-39 years 37/27 = 1.370 and least among those aged 40-49 years (12/13 = .923). Thus the odds that seropositive woman aged 18-29 years prefer dual contraception is (2.542/1.370) = 1.855 times greater than the odds that their counterparts aged between 30-39 years prefer dual contraception. Similarly, the odds that seropositive women aged 30-39 years prefer using dual contraception is (1.370/.923) = 1.484 times the odds that their counterparts aged between 40-49 years prefer dual contraception. Even though this study focused on preference, the findings corroborate findings in USA (Eisenberg, 2012) and South Africa (Moroni *et al.*, 2007) where younger age increased the odds of dual contraception use.

This observed negative association was supported by findings from Focused Group Discussions where majority of women discussants held similar view with the health care providers interviewed that younger women preferred to use dual contraception for dual protection because they were more informed, educated, feared transmitting HIV to their uninfected husbands, adhered to HIV counseling because they report recent HIV diagnosis, bowed less to cultural and social pressure and appreciated the high cost of living thereby

attempting to avoid overburdening themselves with children as noted in Kenya, Namibia and Tanzania (Antelman *et al*., 2015).In this regard, one woman discussant and one health care provider asserted:

"Younger women prefer using dual contraception because of fear associated with recent diagnosis of HIV infection and HIV transmission to their uninfected partner. Being more informed, they prefer using condoms consistently and are subject to fewer myths about contraceptives." ***(FGD-Seropositive woman, Nyatike sub-County).***

"When younger couples are tested and found to be discordant, they tend to have much fear about their health than older couples and as a result tend to adhere to post test HIV counseling through consistent use of ARV drugs and dual contraception for both pregnancy delay and protection against HIV transmission." ***(KI-Healthcare provider, Nyatike sub-County).***

FGD participants together with health care providers further argued that women in their middle ages use long term modern contraceptives for pregnancy but believed that consistent use of ARVs suppresses their viral load to undetectable levels hence do not consistently use condoms. As noted in India with regards to dual contraception use, (Chakrapani *et al*., 2011), this study found that cultural and religious beliefs as well as menopausal belief among seropositive women aged 40 years and above decreased preference for dual contraception. In this regard, one of the healthcare provider interviewee explained:

"Aged women with completely no children don't prefer using dual contraception. If they can get pregnant, they would rather have extramarital sex without using condoms or other family planning methods than stay contented with their current state of parity." ***(KI-Healthcare provider, Nyatike sub-County).***

Studies in Nigeria (Lewani *et al.*, 2014), Ethiopia (Gebrehiwot *et al.*, 2017) and Kenya (Mulongo *et al.*, 2017) have also noted that side effects, spouse refusal, cultural beliefs and need for children decrease odds of dual contraception use.

On the contrary minority of the women discussants opined that need for children, intimacy, and spouse refusal due to fear of infidelity and need for intimacy hinders preference for dual contraception among younger, newly married women, a belief unanimously upheld by all seronegative men interviewed. They noted high parity among older women as a reason for their preference for dual contraception. One health care provider explained:

"Most men who are newly married are opposed to the use of condoms claiming it reduces sexual pleasure and promotes infidelity. They too are opposed to modern contraceptives, forcing most women to use injections which are not easy to detect." ***(KI-Healthcare provider, Nyatike sub-County).***

However the overall chi-square test indicates that there is no statistically significant association between age and dual contraception preference, $X^2(2, N = 174) = 5.964$, $p = 0.051$ and that the observed differences in preference proportions are due to chance. This is so perhaps because all seropositive women in discordant marital relationships are faced with similar dual problem of preventing both unwanted pregnancy and HIV/STIs transmission to uninfected partner. Contrary to this finding, previous studies have focused on dual contraception use and noted a mixed result. Whereas studies in USA (Eisenberg, 2012), Australia (Higgins and Cooper, 2012), South Africa (Moroni *et al*., 2007), Namibia, Tanzania and Kenya (Antelman *et al*., 2015) and Ethiopia (Gebrehiwot *et al.*, 2017) noted significant negative association between age and dual contraception use, studies in Canada (Patterson *et al.*, 2014), Thailand (Munsakul *et al.*, 2016), Ethiopia (Abay *et al.*, 2020) and Uganda (Bongomin *et al.*, 2020) found that older age increases odds of dual contraception use among seropositive women.

Parity and Dual Contraception Preference

The proportion of seropositive women who preferred dual contraception was highest among those reporting 2-3 children (72%) followed by those reporting four and above children (68.6%) and finally the least among those reporting 0-1child (39%).

Table 3: Cross-Tabulation of Parity and Dual Contraception Preference

Number of children	Dual Contraception Preference			
	Yes		No	
	Frequency	Percent (%)	Frequency	Percent (%)
0-1	16	39.00	25	61.00
2-3	59	72.00	23	28.00
4 and Above	35	68.60	16	31.40
Total	110	63.20	64	36.80

0 *cells (0.0%) have expected count less than 5.* $X^2 = 13.652$; $df=2$; $p=0.001$, $N=174$.
No missing case. Test statistically significant at $p < 0.05$.
Source: Field Survey, 2017

Further still, analysis of the crosstab table reveals that the odds that seropositive woman having 2-3 children prefer using dual contraception is high (59/23 = 2.565) followed by those having four and above children (35/16 = 2.188) and least among those reporting 0-1 child (16/25 = .64). Even though the survey results focused on preference for dual contraception, they corroborate findings in Rwanda, Ethiopia and Kenya where low parity was found to decrease odds of dual contraception use among adults (Antelman *et al*., 2015; Jean *et al.*, 2022; Jemberie *et al.*, 2023). The survey results however contradict findings in Ethiopia (Gebrehiwot *et al.*, 2017) where low parity increased the odds of dual contraception use among seropositive women.

The overall chi-square test further indicates that there is statistically significant association between parity and dual contraception preference $X^2(2, N = 174) = 13.652$, $p = 0.001$ and that the observed differences in preference proportions are not due to chance. Women who have more children are more likely to prefer using dual contraception than their counterparts of low parity, possibly because they have attained their desired family sizes. Similar to the survey result which focused on preference for dual contraception, a study in Rwanda (Jean *et al.*, 2022) and Kenya (Antelman *et al*., 2015) that correlated parity and dual contraception use found a significant positive statistical correlation between the two variables and attributed it to personal and partner desire for biological child.

Further interrogation of the subjects in focus group discussions and in-depth interviews with both seronegative men and health care providers greatly supported survey results. Seropositive women discussants held similar view with healthcare providers and seronegative men interviewed that seropositive women with fewer or no children do not prefer using dual contraception given their need for more children. They argued that women who had more children appreciated the high cost of living and therefore sought to avoid increasing this number further as well as minimize their chances of bearing HIV infected children by applying dual contraception. In support of this view, one woman participant and one healthcare provider asserted:

"I was recently married and still don't have any child. I don't use dual contraception because I need to conceive. I only use condoms rarely. I think women who have more children may apply dual contraception more than those with few or non like me." ***(FGD-Seropositive woman, Nyatike sub-County).***

"Those with many children may prefer dual contraception because they have the number of children they desire … and they also feel the burden of large families." ***(KI-Healthcare provider, Nyatike sub-County).***

Previous studies in India (Chakrapani *et al*., 2011), Nigeria (Lewani *et al*., 2014), Kenya (Antelman *et al*., 2015; Mulongo *et al.,* 2017) and Rwanda (Jean, *et al.,* 2022) have noted that desire for biological child lessen dual contraception use among women with none or one child.

It was further noted that having children of one gender lessen preference for dual contraception, indicating cultural influence on dual contraception. Emphasizing this view, one woman participant asserted:

"You may have seven daughters and no son. This means culturally you have no heir. You have to strive to get a son…some women also strive to get daughters if they are not yet blessed with one." ***(FGD-Seropositive woman, Nyatike sub-County).***

Many studies on dual contraception have focused on its use among adults (Lewani *et al*., 2014) and seropositive women (Tsuyuki *et al*., 2003; Moroni *et al*., 2007; Lewani *et al*., 2014; Antelman *et al*., 2015) with few correlating parity and dual contraception use (Antelman *et al*., 2015; Gebrehiwot *et al.,* 2017 and Jean *et al.,* 2022). Contrary to previous studies, this study has established a significant positive statistical association between parity and preference for dual contraception among seropositive women in discordant marital relationships.

Level of Education and Dual Contraception Preference

The proportion of seropositive women who preferred using dual contraception generally increased with increase in level of education. Those who had none, primary, secondary and tertiary education and preferred dual contraception were 4 (28.6%), 68 (60.2%), 25 (78.1%) and 13 (86.7%) respectively as shown in Table

Table 4: Cross-Tabulation of Level of Education and Dual Contraception Preference

Level of Education	Dual Contraception Preference			
	Yes		No	
	Frequency	Percent (%)	Frequency	Percent (%)
None	4	28.60	10	71.40
Primary School	68	60.20	45	39.80
Secondary School	25	78.10	7	21.90
Tertiary	13	86.70	2	13.30
Total	110	63.20	64	36.80

0 cells (0.0%) have expected count less than 5. $X^2 = 14.282$; df=3; p=0.003, N=174.
No missing case. Test statistically significant at $p < 0.05$.
Source: Field Survey, 2017

Further analysis of the crosstab table revealed that the odds of preference for dual contraception was highest among seropositive women with tertiary education (13/2= 6.5), followed by secondary (25/7=3.571), primary (68/45=1.511) then least among those with no basic education (4/10=.4). These statistics indicated a possible positive relationship between levels of education and dual contraception preference.

The overall chi-square test further indicates that there is statistically significant association between level of education and dual contraception preference $X^2(3, N = 174) = 14.282$, $p = 0.003$. Educated women are more likely to prefer using dual contraception than their counterparts with no education. Studies in Thailand (Munsakul *et al.*, 2016), South Africa (Moroni *et al*., 2007), Namibia, Tanzania and Kenya (Antelman *et al*., 2015), and Uganda (Bongomin *et al.*, 2023) found no correlation between level of education and dual contraception use among seropositive women. Conversely, a significant positive correlation between level of education and dual contraception use has been noted in Ethiopia (Teklu and Davey, 2008; Gebrehiwot *et al.*, 2017; Abay *et al.*, 2020), Rwanda (Jean *et al.*, 2022) and Kenya (Mulongo *et al.*, 2017) among seropositive women. The significant positive statistical association between education level and dual contraception preference noted in this study is however unique because of its focus on preference for dual contraception, an area which has not been explored by other studies.

Participants of both FGDs and IDIs unanimously agreed that less educated seropositive women do not prefer dual contraception because they hold a myriad of misconceptions about the side effects of contraceptives which affects concurrent use of condoms and modern contraceptives and bowed to pressures from their husbands, culture, religion, and societal beliefs with regard to contraception use. These reasons have also been noted to reduce the odds of dual contraception use among seropositive women in India (Chakrapani *et al.*, 2011) and Bungoma County in Kenya (Mulongo *et al.*, 2017). More educated women were believed to be more informed on the available contraceptive options, focused on furthering their education and achieving career goals and were less susceptible to cultural, religious and partner influences. One woman discussant and one healthcare provider interviewee asserted:

"Most seropositive women with low levels of education hold negative effects about modern contraceptives; some, for example, believe that they cause deformities in unborn children while some associate them with little sexual satisfaction. This impedes concurrent use of condoms and modern contraceptives." ***(FGD-Seropositive woman, Nyatike sub-County).***

"I strongly believe those with high education levels prefer dual contraception more than those with low education levels. A university graduate can easily understand HIV mutation and benefits of dual contraception than a primary school dropout. .....those with low education hold the belief that ARVs reduce their viral load to the extent that they can continue having unprotected sex and extramarital affairs". ***(KI-Healthcare provider, Nyatike sub-County).***

The observed significant association between education and dual contraception preference in this study and non-correlation with use in other studies may be due to the fact that to some extent preferences do not necessarily translate into use, given numerous factors influencing use such as male partner disapproval of dual contraception (Mulongo *et al.*, 2017; Bongomin *et al.*, 2023), negative attitude towards condoms and fear of side effects of hormonal contraceptives among some seropositive women (Chakrapani *et al.*, 2011).

Level of Monthly Income and Dual Contraception Preference

The proportion of seropositive women who preferred to use dual contraception generally increased with increase in level of monthly income. Those who earned Ksh.0-5000, Ksh.5001-10,000 and over Ksh.10,000 and preferred dual contraception were 60 (55.6%), 32 (74.4%), and 18 (78.3%) respectively.

Table 5: Cross-Tabulation of Monthly Income and Dual Contraception Preference

Monthly Income	**Dual Contraception Preference**			
	Yes		No	
	Frequency	Percent (%)	Frequency	Percent (%)
Ksh.0 - 5,000	60	55.60	48	44.40
Ksh.5,001- 10,000	32	74.40	11	25.60
Over Ksh.10,000	18	78.30	5	21.70
Total	110	63.20	64	36.80

0 cells (0.0%) have expected count less than 5. $X^2 = 7.285$; df=2; p=0.026, N=174.
No missing case. Test statistically significant at $p < 0.05$.
Source: *Field Survey, 2017*

Further analysis of the crosstab table reveals that the odds of preference for dual contraception increased with increase in income levels indicating positive relationship between levels of income and dual contraception preference. The odds of preference was highest among seropositive women earning more than Ksh.10,000 (18/5=3.6), followed by those earning between Ksh.5001-10,000 (32/11=2.909) and least for those earning less than Ksh.5000 (60/48=1.25).

The overall chi-square test further indicates that there is statistically significant association between level of monthly income and dual contraception preference $X^2(2, N = 174) = 7.285$, $p = 0.026$. Women who earn higher monthly incomes are therefore more likely to prefer using dual contraception than their counterparts who earn low monthly incomes. Previous studies have noted that seropositive women earning high income report high use of contraceptives than those earning low income (Agha, 2000; Bongomin *et al.*, 2018; Damian *et al.*, 2018) while cost of contraceptive was not a barrier to dual contraception use among men and women living with HIV (Chakrapani *et al*., 2011) because contraceptives were offered free in health facilities.

This was supported by views of survey subjects further probed in focus group discussion who held the view that women with high incomes preferred to use dual contraception because they could easily afford contraceptives like implants, IUDs and sterilization charged in various health facilities to use concurrently with condoms as was noted in Nigeria (Lewani *et al*., 2014). These views were supported by healthcare providers and seronegative men who further noted that women of high income could travel to seek family planning services in distant facilities if their desired services were not available at their local health facilities and appreciated the high cost of living thus applied dual contraception to reduce the economic burden. It was further noted that women with lower income could not travel to far health facilities where female sterilization and IUDs services were offered because both transport cost and service fee were beyond their reach. They thus opted for condoms only or contraceptive pills and injections offered freely. This finding

concurred with finding in Uganda where high cost of contraceptives reduced odds of contraceptive use as a single method (Kayongo, 2013). In this regard, one woman discussant asserted:

''Some contraceptives like implants and IUDs are charged in health facilities. Even though the charges are low, some of us may not afford it due to widespread poverty in the area, making it difficult to use condoms and contraceptives simultaneously.'' ***(FGD-Seropositive woman, Nyatike sub-County).***

Conclusions and Recommendations

Conclusions

To establish the association between socio-demographic factors and dual contraception preference, the study concluded that there is no significant statistical association between age and dual contraception preference. However parity, level of education and level of monthly income had a significant positive statistical association with dual contraception preference.

Recommendations

Recommendations for Policy Formulation

- Based on finding that parity had a significant positive association with dual contraception preference, the study recommends to health care providers in Nyatike Sub-county to educate seropositive women on safe conception measures to minimize HIV transmission to uninfected male partners.
- Based on findings that level of education and level of monthly income had significant positive association with dual contraception preference, the study recommends to health care providers in Nyatike Sub-county to sensitize women of low education on the benefits of dual contraception to increase dual contraception preference among them. The study also recommends to Ministry of Health at National and County governments to build more health facilities to reduce transport cost to distant facilities to increase dual contraception use among seropositive women of low income.

Recommendations for Further Research

Further research into the effect of child gender on consistent use of dual contraception among discordant couples is proposed.

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