

**FACTORS ASSOCIATED WITH CONTRACEPTION NON-USE AMONG
WOMEN AGED 15-24 YEARS IN MIGRANT COMMUNITIES IN SOUTHERN
AFRICA IN 2018**



D S Mapiye (473320)

Supervisors: Professor Jonathan Levin and Christine Chawhanda

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DECLARATION

I, Darlington Shingirirai Mapiye (student number 473320) am submitting my research report in partial fulfilment of the requirements of the Master of Science in Epidemiology in the field of Epidemiology and Biostatistics at the University of Witwatersrand, School of Public Health. I declare that all material presented in this report is my own work and has not been submitted before for any degree at any other university. Where I used materials/thoughts from other sources, I have properly acknowledged through the conventional referencing.

Signed: *dsmapiye*
.....

Date: [3rd] day of [February] in the year [2022]

DEDICATION

I dedicate this work to all young women who are striving for better reproductive health outcomes.

ABSTRACT

Introduction

The non-use of contraceptive among young women aged 15-24 years is a public health concern because of its adverse social and reproductive health outcomes. The extent of contraceptive non-use as well as the factors associated with their non-use particularly among young women, specifically in high migrant communities need to be investigated further. The aim of this study was to investigate factors associated with contraceptive non-use among young women residing in high migrant communities in Southern Africa.

Methods

The study was a secondary data analysis conducted within the larger sexual and reproductive health rights and HIV knows no borders project (SRHR-HIV). The SRHR-HIV project was a longitudinal study which included a cross-sectional baseline survey which was conducted in 2018 to collect data on sexual and reproductive health in 10 high migrant communities in six Southern African countries. In this analysis, the study population was restricted to women aged 15-24 years. Descriptive statistics and multivariable logistic regressions were performed to investigate demographic, social-economic and behavioral factors that are associated with contraceptive non-use. Additional analyses were conducted using multi-level logistic regressions.

Results

Of the 1 242 eligible women aged 15-24 years, 588 reported not having used any method of contraception representing a prevalence of 47.3%. Overall, 69% of the women were non-migrant, international migrants had the lowest proportion with 12% and 19% were internal migrants. Contraceptive non-use was high among international migrants (56%) and lowest for internal migrants (38%). Using multivariable logistic regression, age, religion, and ability to refuse sex were significant factors ($p < 0.05$) associated with contraceptive non-use among young women. Contraceptive non-use decreased with increasing age (aOR 0.75, 95% CI 0.69,0.81), was higher for women unable to refuse sex (aOR 1.39, 95% CI 0.92,2.11). Contraceptive non- use was also higher among women of Catholic (aOR 1.75, 95% CI

0.81,3.77) , Protestant (aOR 2.58, 95% CI 1.18,5.68), Islam (aOR 4.62, 95% CI 1.36,15.73) religions.

Conclusion

The findings of this study highlighted the influence of age, religion, and inability to refuse sex as some of the factors associated with contraceptive non-use among young women. These factors were found were found not to differ among migrants. The findings should be considered and reflected in public health policies to address barriers to the use of contraceptives by women aged 15-24 years.

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Abbreviations

SRHR: Sexual and Reproductive Health Rights

CI: Confidence Interval

OR: Odds ratio

SD: Standard Deviation

IQR: interquartile range

ICC: intraclass correlation coefficient

AOR: Adjusted odds ratio

SSA: Sub-Saharan Africa

LMIC: Low medium income country

IUD: Intrauterine devices

FP: family planning

WHO: World health organisation

<:less than

>: Greater than

AYP: Adults or Young people

1 CHAPTER 1: INTRODUCTION

The chapter begins with a general background on contraceptive usage in sub-Saharan Africa (SSA). This is followed by the problem statement. The study rationale and review of the available literature on contraceptive usage is also presented. The chapter concludes with a description of the study aims and objectives.

1.1 Background

Contraception is defined as a method used to prevent or space the number of future pregnancies. Contraceptive non-use in this research refers to a woman who reports that she does not use any method of contraception. Contraceptive methods can be split into two main categories which are traditional and modern methods. Modern contraceptive methods include oral contraceptives, intrauterine devices (IUDs), female and male sterilisation, injections, condoms, and the diaphragm (1). Traditional methods include periodic abstinences and withdrawal (1). The use of contraceptives is a crucial approach for minimizing maternal and neonatal deaths, mainly in resource-constrained countries where the majority of maternal and child deaths happen (2). Using contraceptives may reduce mortality through various methods: by preventing unplanned pregnancies in doing so lessening maternal deaths which can be attributed to dangerous abortions, reducing pregnancy among young women who may be at increased risk of premature death during childbearing and increasing the spacing between pregnancies (3). Thus, the role played by contraceptive use in minimizing maternal morbidity and deaths is important (4). Therefore, policies and programs geared towards reducing the rates of unintended pregnancies should be reinforced through improved understanding of the reasons why women struggle to use contraceptives.

Approximately one billion of the world's population is composed of young people between the age of 10 and 24 years (5). Many of these young people live in developing countries and 9 out of 10 countries with the youngest populations are found in SSA (5). The median age of most SSA countries is approximately 25 years, necessitating the need for development and well-being of the youth especially women (5). Currently, SSA is experiencing rapid socio-economic changes that have a profound impact on the health of young women (6). Two major challenges

in SSA are adolescent childbearing and unintended pregnancies, with the rates of both among the highest in the world (7).

As young women mature, they are gradually exposed to numerous reproductive health risks such as sexually transmitted diseases(8). Increasing exposure to these risks has drawn considerable attention within society with the overall goal of understanding the extent, causes, and methods that can be used to address this problem (8). The World Health Organisation (WHO) emphasised adolescent reproductive health needs and committed itself to promote their reproductive health (9). In Latin America, a moderately high percentage of adolescents are exposed to the increased risk of unintended pregnancy and their incidence of childbirth is high (10). This increases with age, from an estimated 37.2% among women aged 15–19 to 73.7% among women in general (10). In addition, considering women in general, an estimated 95% of unplanned pregnancies occur among women who either use their method of contraception inconsistently or incorrectly or are not using any method at all (11). This highlights the need to focus properly on the reproductive health needs of women. In Asia, results vary as childbirth and early marriage is prevalent. Despite having a restricted minimum age of marriage, there is still a substantial number of adolescent pregnancies reported in rural India (12). Abortions are rising among teenagers in China, a potential indicator of the growing sexual activity within this age-group (13). In SSA, a substantial number of women aged 15-24 years who are at a higher risk of unplanned pregnancy, do not receive adequate reproductive health education, and experience a high incidence of adolescent childbirth (11). Despite several strategies implemented to mitigate against the number of unintended pregnancies, for example, availing the provision of contraception as a basic human right, the number of pregnancies among young women continues to rise (11).

Having an unintended pregnancy may increase young women's risk of experiencing adverse health outcomes (14). In SSA it is more dire as most young women have a disproportionately high risk of adverse pregnancy outcomes. This risk increases with each successive pregnancy(14). For countries in SSA, sexual maturation and the advent of sexual related activities are increasingly happening at younger ages. For instance, in South Africa the number of babies born to adolescents is estimated at 17 000 annually (15). Not only does this have demographic implications, but it has an adverse effect on the reproductive health of young women. Young women who give birth early are exposed to a higher risk of dying from obstetric causes than older women (14) and for every maternal death, a significant proportion of

surviving women suffer debilitating illness and severe disability(14). This occurs even though correct and continuous use of contraceptives can lessen the possibility of an unplanned pregnancy. Unplanned pregnancies add significantly to high maternal and neonatal death rates among young women (2). This occurs through amongst other things dangerous abortions and injuries during births (16). Thus, delaying or reducing the number of pregnancies occurring amongst young women may be a vital intervention to avert and minimize maternal deaths (14).

In SSA, internal and external migration plays a critical role in unpacking population dynamics and has a great effect on the population structure of any given country (17). Migration is one of the three components of population change. Often, the role played by migration is not prioritised by many governments and key policymakers in SSA. In general, there is a lack of understanding of the magnitude and extent of migration and its association to reproductive health and overall welfare of women (14). Other components, fertility, and mortality have been more widely studied with compelling evidence of their association with migration. When women migrate, they usually find themselves confronted with different social, cultural, and economic environments which may alter their perceptions and behaviour (14). Migration among women and the implication of migration on health outcomes require an in-depth comprehension of the complex sexual and reproductive health requirements of women. Contraceptive non-use among migrant women is of great importance because of its influence on fertility and reproductive health (17). This study, therefore, will address this gap by investigating factors associated with contraceptive non-use among young women aged 15-24 years residing in high migrant communities. This includes both migrant and non-migrant women.

1.2 Statement of the problem

Migrants account for a significant number of the world's total population, of which approximately 48% are women (19). The majority of them are young women who are in the reproductive age group, are exposed to early parenthood through unintended pregnancies, and are residing in LMICs (20). Compared to the rest of the world, SSA has some of the highest rates of adolescent pregnancy coupled with the lowest rates of contraception usage, with an estimated 1 in 3 unintended adolescent pregnancies (14). Neglecting the reproductive health desires of these young people who constitute an important part of the population in SSA has

potential long-term consequences on the capabilities of the next generation of women. To date, studies that focus on understanding factors that prevent women of reproductive age, namely 15–49 years from using modern contraceptives usually under-represent adolescent women, despite them facing disproportionate medical consequences of unintended pregnancies (14). This is complicated further when migration of the women is considered. In SSA, there is limited availability of evidence on how migration adversely affects women's capability to plan their families by making use of contraception(21). Studies that have linked rural migrants with contraceptive non-use tend to focus more on older populations who have a defined family structure such as a husband and a wife (22). This necessitates the need to explore the nexus between migration and contraception among young women. In general, there is relatively little published work on the different aspects of contraceptive non-use among young women residing in high migration communities (23). Factors that influence non-use of contraceptives among young women in SSA are insufficiently studied and data on the determinants of contraceptive non-use is scarce irrespective of migration status (22). Most evidence on contraceptive non-use by young women comes from studies with minimal focus on high migrant communities (22). Most of the research undertaken to investigate factors that are associated with contraceptive non-use applies to women in general, while a few studies have been carried out to investigate factors that are uniquely associated with contraceptive non-use among young women aged 15-24 years residing in high migrant areas (22). Although some associations have been identified, none of the studies have really quantified the magnitude of the associations and clearly attributed them to young women in high migration areas.

1.3 Rationale

The extent of contraceptive non-use as well as the factors associated with contraceptive non-use among young women in Southern African countries, specifically in communities with a high proportion of migrants still needs further investigation. Most studies that have contributed to our knowledge of contraceptive non-use among young migrant women have not focused in-depth on individual and community level factors (17). Thus, the extent to which individual and some community level characteristics influence contraceptive non-use among young women in high migrant communities is not clear. Understanding key factors affecting contraceptive non-use among adolescents and young women could provide additional information needed to inform policy making on the gaps in family planning services, influence policies in public

health on the reproductive health of young women, design effective targeted interventions to improve uptake of contraceptives and minimize the risk of maternal deaths and morbidity (31).

1.4 Literature review

Contraception is considered as any practice undertaken to minimize the risk of conception or the use of a device or technique to prevent conception (25). For centuries women have tried many methods to prevent unintended pregnancies. Before modern methods of contraception, women used such methods as withdrawal or periodic abstinence, while ancient Egyptian women used honey, acacia fruit, and acacia leaves to prevent conception (26). These methods had a high failure rate. In the United States, around 1914-1916, the first clinic for birth control was opened (27). In the United Kingdom, the first birth control clinic was opened in 1921 and by 1930 the number had increased to five (28). In 1956, the first clinical trials for oral contraceptives were conducted in Puerto Rico which resulted in the first oral contraceptive Enovid being approved by the US Food and Drug Administration (FDA) in 1961 with intrauterine devices (IUDs) being added to the list in the late 1960s and early 70s (29).

SSA has the lowest level of contraceptive use compared to other regions (7). Approximately one in five women who have attained reproductive age make use of a modern method of contraception. This occurs despite the region having a high rate of fertility coupled with a desire among women to space and reduce births (7). In SSA, access to reproductive health services is low especially among rural, less educated, and poor women (7). Disparities in the uptake and use of contraceptives exist between poor and wealthy countries (7). The total fertility rate of the world has decreased, from approximately 5 children per woman in the early 1950s to approximately 2.6 children per woman currently (2020). This can be attributed to the more prevalent modern contraceptives use, especially in the developing world (7). Although significant development has been made to improve the provision of reproductive health services worldwide (7), a significant gap still exists to adequately provide the contraception needs of adolescents.

1.4.1 Contraceptive use in sub Saharan Africa

Among different SSA regions, the lowest use of contraception is in Central Africa, where an estimated 73% of sexually active adolescents who may want to avoid pregnancy are not using any modern contraceptives (7). In Southern Africa, this proportion is approximately 32%. Despite preferring to delay pregnancy, adolescent women in SSA often report several reasons for not using contraceptive(7). Among never married sexually active women wanting to avoid pregnancy, the most common reason provided for not using contraceptives is not having regular sexual intercourse (49%), followed by not being married (29%) and concerns about contraceptive side effects (19%) (7). Demographic and Health Surveys (DHS) from more than 30 countries revealed that adolescent contraceptive practices were characterized by variable use and a high rate of discontinuation (7). Despite having some knowledge on contraception among sexually active adolescents, the use of contraception has been very low (7).

The rate of contraceptive use in SSA is comparatively lower than in other developing world regions (7). Data from population-based surveys in Africa show low rates of contraceptive use among women (30) with levels of contraceptive use varying vastly across different regions. Before the 1980s, contraception was not regularly used in SSA due to limited access (7). On the other hand, the report from the Population Reference Bureau (1992) consistently showed that compared to other regions, women in SSA are much less likely to openly state that they currently do not want more children (7). Even within the region itself, huge disparities exist, one of the important factors is ethnicity which sometimes is used to define marital constructs, initiation, and acceptability of sexual behaviour, and how to resolve unintended pregnancies when they happen (7). In Kenya, different ethnic groups have varied sexual customary beliefs, with differing consequences associated with pregnancy before marriage, level of knowledge and use of contraception (31). In Namibia, it was reported that women in general have reduced control and participation in decision regarding their reproductive health, and in several occasions, men usually make the final decision on the size of the family (32).

In Chad, the use of contraception is rare, with an estimated 1.6 percent of women aged 15-49 using some form of contraception (33). In sharp contrast, in South Africa, about 59.8 percent of women of child-bearing age use contraception (34). In Nigeria, approximately 1.2 percent of married adolescent females reported using a modern method of contraception (12,13). In Mozambique, the proportion of married women using modern contraception was 21% in urban

areas and 7% in rural areas (7). In most SSA countries married adolescents are unlikely to take steps to avoid unintended pregnancy (7). By region, the prevalence of contraceptive use in western and central Africa lag far behind those in eastern and southern Africa. Since the introduction of family planning programs, 75 % of countries provide contraceptives directly through government managed health facilities, while 17 % of governments provide support through collaboration with non-governmental organizations. There has been a gradual reported increase in contraception use among women aged 15–49 years with the prevalence of contraception among single young women 15–24 years have risen from 23% in 1996–2000 to 33% in 2011–2015 (7).

1.4.2 Contraception and health implications

Pregnancy and childbirth are some of the leading causes of death among women aged 15–19 in LMICs (14). Not only is adolescent pregnancy dangerous for the mother, but it is also dangerous for the child (14). In LMICs, compared to older women, stillbirths and deaths in the first week or first month are higher among babies born to mothers younger than 20 years (14). For the younger mothers, the risk of mortality is higher. Also, the number of preterm births, babies born with low birth weight, and asphyxia are higher among the children of adolescent women (14). These health conditions increase the likelihood of death or future health problems for new born babies (14). In this context, the use of any method of contraception is crucial to reduce pregnancy-related morbidity and mortality. Health outcomes of young women and their babies can be improved by proper and consistent use of contraception methods (14). In SSA, more than 75% of young women report having engaged in sexual intercourse in their teenage years and a third of women report giving birth well before the age of 20 (7). In this age group, early sexual debut is associated with high mortality and morbidity resulting from pregnancy (7).

Fundamental to reproductive health is reducing the number of unintended pregnancies as they are associated with poor health outcomes (7). In Southern Africa, an estimated 55% of pregnancies are unintended, followed by approximately 44 % in Eastern Africa and roughly a quarter in North and Western Africa (7). The high number of unintended pregnancies is perhaps a reflection of sexually active women in SSA who may desire to delay or limit childbearing but are not using and do not have access to effective methods of contraception.

For women of reproductive age, preventing unintended pregnancies requires access to and use of safe and effective contraception methods (7). While consistent and correct use of contraception may reduce the risk of unintended pregnancy, SSA has some of the lowest rates of contraceptive use with a substantial proportion of pregnancies being considered unintended(7) . Not only does the use of contraception methods prevent the occurrence of unintended pregnancies, but it also provides other benefits, such as reduced neonatal, infant, and child mortality (10).

For health systems in LMICs to respond timely and effectively to the growing population of young women, it is vital to improve our understanding of their changing reproductive health needs as well as the social contexts within which these changes occur. Over the years, the emphasis focused on increasing the number of services provided rather than a dual approach that would include the quality of contraception methods (7). Evidence from several programs demonstrates that despite quantity being important, the quality of services provided can have an important impact on contraceptive use. Yet, an estimated 12 to 42 percent of married young women in SSA who prefer to space or limit the number of childbirths are not using any contraception method (7). This may be an indication of unmet needs for contraceptives compounded by several structural barriers that prevent young women from using contraceptives (7). According to the WHO, fulfilling unmet need for contraception can reduce the number of maternal deaths by over a third (35). Despite the health benefit, over 200 million women whose preference is to defer or avoid being pregnant have limited access to effective and safe methods of contraception (36). Thus, in addition to the provision of skilled maternal care, it is imperative to offer adequate reproductive health services to avert maternal deaths. In the African context, couples who are married, irrespective of age are constantly under immense societal pressure from their family members to bear at least one child immediately after getting married. Failure to bear a child immediately after marriage may result in shame or unfair stigmatisation (37). This occurs even though young women who have just married can significantly benefit from the use of contraception by delaying first pregnancy until they are physically mature to carry a healthy pregnancy to term, and by spacing subsequent pregnancies (38).

1.4.3 Migration and contraceptive use in SSA

SSA is one of the regions with the highest urban population (39). To some extent, this population growth is driven by rural-urban migration (39). Over the last decade, a lot of attention has been focused on international migration from LMICs to high-income countries (39). Recently, there has been a shift towards internal and regional migration. Internal migration is an integral part of socio-economic transformation in many countries (39). Also, there has been a gradual shift towards feminisation of migration (39). Understanding how the migration of females is associated with health outcomes requires an interrogation of the sexual and reproductive health needs of female migrants (39). For women, migration can be a life-changing occurrence with overwhelming consequences on their reproductive health needs (40).

In SSA, although data on internal migration and reproductive health is incomplete, limited, and fragmented, existing trends show its gradual increase in the last 10 years (26). Data on gender and migration in SSA indicate that a growing number of women are moving to urban areas which can be attributed to women increasingly seeking formal employment (26).

The association between migration and patterns of contraceptive use can either be direct or indirect (41). An indirect association may arise as a result of disparate family formations which can be directly associated with contraceptive use. Migration status can also be influenced by socio-economic, cultural, and demographic fertility factors (41). For instance, migrant women may find it difficult to continue using contraception because of limited knowledge of where to find contraceptives in their new area of residence, and sometimes the method of contraception that they use requires clinical attention which may not be available at their place of destination (41).

As women migrate to different places, they are confronted with different contraceptive use behaviours (42). Changes in the characteristics of women and their surrounding environment as a result of migration may cause migrants to adopt certain contraceptive use behaviours prevalent at their destination (41). Urban areas of many developing countries are often associated with levels of higher education, access to reproductive health services, and other social services (43). As a result, the rates of contraceptive use are higher in these urban areas than rural areas.

Young migrant women are often exposed to more liberal social contexts characterised by extramarital sex, substance abuse, and multiple partners (44). Often, migrant women who are separated from their partners or families may be tempted to engage in riskier sexual behaviours (44). This can be via pursuing companionship and socio-economic support from multiple extramarital partners (44). Sometimes migrant women maintain concurrent relationships in both their place of origin and communities where they migrate to (44). These women are often faced with psychosocial vulnerabilities and economic marginalization which may cause them to engage in more risky behaviours than they would have if they had remained in their original home communities (44). As a result migrant women are more likely to experience unplanned pregnancies, induced abortions, and adverse pregnancy outcome (45). To mitigate these risks, there is a need to clearly understand factors that are associated with contraceptive non-use among young migrant women, so that targeted interventions that can improve overall health outcomes can be designed (45).

1.4.4 Conceptual framework for the determinants of contraceptive non-use

The conceptual framework utilizes and extends existing knowledge to analyze socio-economic, behavioural, societal, and demographic factors associated with contraceptive non-use among young women residing in high migration communities. While not all variables and pathways are included in this framework, it offers an important starting point and provides guidance in selecting the variables which influence contraceptive non-use among young women (Figure 1). Contraceptive non-use among women is shaped by factors such as age, level of education

Amongst women aged 15-24 years, inadequate access and provision of reproductive health services and negative attitudes of service providers can hamper contraceptive use (46). The use of reproductive health services is associated with higher levels of education attained by a woman (47). Despite the positive effect of education, gender-based imbalances in women's access to education affect women's decision-making autonomy thereby influencing their access to and utilisation of reproductive health services (48).

The framework used is generalized for both young and older women but the factors associated with contraceptive non-use may operate differently within each age group. These differences can be attributed to disparities in factors such as empowerment, marital status, number of household members, and desire to have children. For instance, the number of household members affects the proportion of women using contraception (49). This pattern was found to be more pronounced in the 20-39 age group (50). Attitudes and community characteristics where young women reside may influence their use of contraception through several pathways. Although socio-economic and demographic factors are key determinants of health service use, societal and behavioural factors influence the extent to which these factors interact to affect contraceptive non-use among young women.

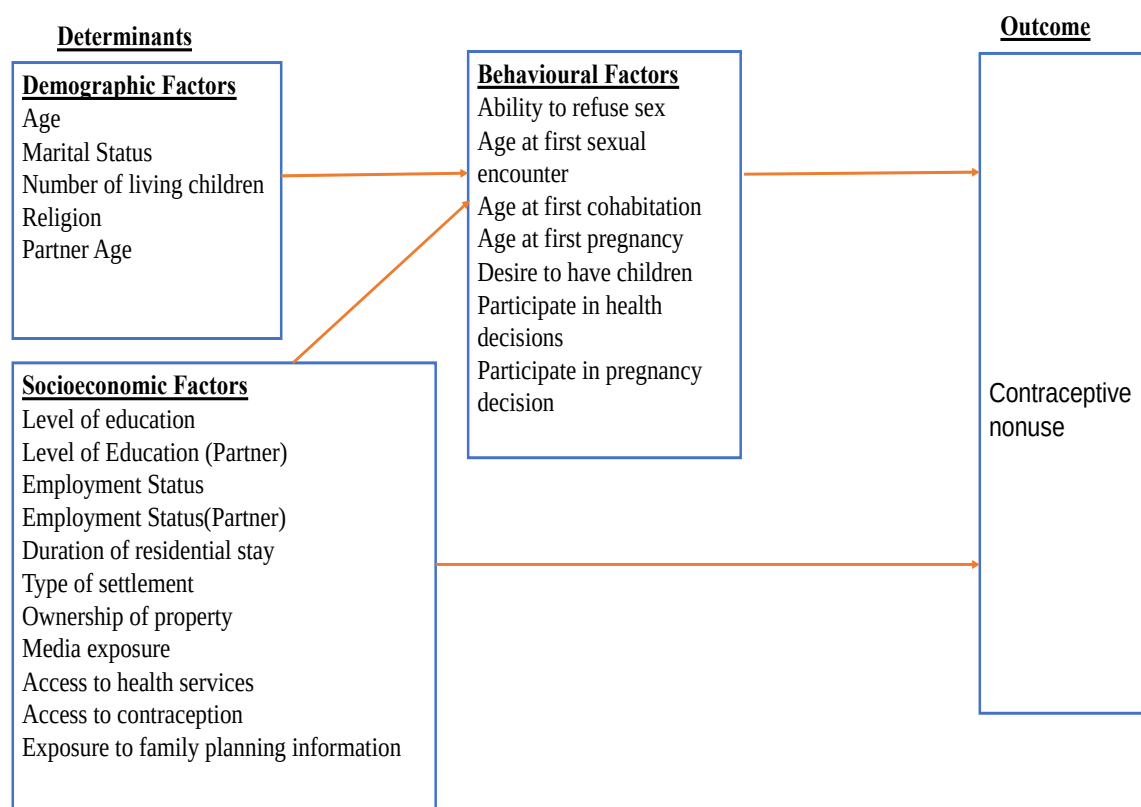


Figure 1: Conceptual framework for determinants of contraceptive non-use

1.5 Study aims and objectives

The main aim of this research is to determine factors that are associated with contraceptive non-use among adolescents 15-19 years and young women 20-24 years in ten high migrant communities in six Southern African countries. The research has the following main objectives:

- To describe patterns of contraceptive use and non-use among adolescents and young women in 10 high migration communities in six Southern African countries.
- To determine key factors that are associated with contraceptive non-use among adolescents and young women in these high migrant communities.
- To investigate whether the factors associated with contraceptive non-use among adolescents and young women in high migration communities are consistent across the six Southern African countries.

2 CHAPTER 2: METHODS

2.1 Introduction

This chapter describes the study design, data management, and analysis methods. Eligibility criteria and definitions of study variables are described in detail. Multiple logistic regression as the main statistical method applied for quantitative data analysis is described. Additional analysis carried out using multilevel models is also described. The chapter ends with a review of the data processing methods and ethical considerations.

2.2 Sources of data

2.2.1 Study Design

This project utilized secondary data from a cross-sectional survey carried out in 10 high migration communities in six Southern African countries.

2.2.2 Study setting

This project was conducted within the larger SRHR-HIV project. The SRHR-HIV project was a longitudinal study which included a cross-sectional baseline survey which was conducted in 2018 to collect quantitative data on sexual and reproductive health in 10 high migrant communities in six Southern African countries namely Hhohho (The Kingdom of Eswatini), Maputsoe (Lesotho), Mwanza and Mchinji (Malawi), Chifunde and Ressano Garcia (Mozambique), Ekurhuleni and Nkomazi (South Africa), Chipata and Katete (Zambia). All study sites were chosen because of the high influx of migrants, both external and internal. The study was done to collect and analyze data to improve sexual and reproductive health programs among people living in these communities.

2.2.3 Study Sites

Secondary data analysis was performed on data collected from 10 high migrant communities in six southern African countries namely Hhohho (The Kingdom of Eswatini), Maputsoe (Lesotho), Mwanza and Mchinji (Malawi), Chifunde and Ressano Garcia (Mozambique), Ekurhuleni and Nkomazi (South Africa), Chipata and Katete (Zambia). Hhohho is a region located in the western part of Eswatini, its population is estimated to be 400,000 people. Hhohho is the most economically advanced region of Eswatini and biggest urbanized population in that country. Maputsoe is a town located in the northern district of Leribe in Lesotho. Maputsoe shares a border-post with Ficksburg in the eastern Free State. Mwanza is a Malawian town on the border with Mozambique with an estimated population of 30,000 people. It is the administrative headquarters for Mwanza District. Mchinji is located near the Zambian border and covers an area of 3,356 km² and has an estimated population of 400,000 people. Chifunde is a district in Tete Province in western Mozambique, and shares a border with Zambia in the north and Malawi in the northeast. Chifunde covers an approximate 9,403 square kilometres (3,631 sq mi) with an estimated population of 200,000. Ressano Garcia is a small town in Maputo Province, Mozambique with an estimated population of 50,000 and is adjacent to South Africa. In 2016, approximately 4 million people lived in Ekurhuleni. Nkomazi Local Municipality is located in the Ehlanzeni District Municipality, Mpumalanga. Chipata is a town located in Zambia. A significant amount of trade occurs between Zambia and Malawi via Chipata while Katete is a town located in the Eastern Province of Zambia.

2.2.4 Study population

The SRHR-HIV knows no borders project included both males and females. In this secondary analysis the study population was restricted to females 15 -24 years residing in Hhohho (The Kingdom of Eswatini), Maputsoe (Lesotho), Mwanza and Mchinji (Malawi), Chifunde and Ressano Garcia (Mozambique), Ekurhuleni and Nkomazi (South Africa), Chipata and Katete (Zambia) in 2018.

2.3 Sampling strategy

Participants in the primary study were selected using multistage sampling in each site, with villages or similar areas forming the clusters. A total of 300 respondents per site were selected. In each site the sample of respondents was selected as follows: 120 Female Adults or Young People, 60 Females (not AYPs), 60 Male AYPs and 30 Males (not AYPs); also 30 Female sex workers were selected separately.

2.3.1 Power and sample size

Given a sample size of 2100 in all 10 sites in the primary study, this secondary study will have 82% power at 5% level to detect a 12% absolute difference in contraceptive non-use between migrants and non-migrants, assuming that the proportion of contraceptive non-use is 35% among migrants and 23% among non-migrant women and in addition assuming that approximately half of the women are either internal or external migrants and half of the women are non-migrants.

2.3.2 Inclusion Criteria

Female respondents 15-24 years residing in 10 communities of the six South African countries were included in this secondary analysis.

2.4 Description of variables

2.4.1 Outcome variable

A secondary analysis of the cross-sectional study (SRH-HIV) conducted in 2018 was performed. The primary outcome variable for this analysis is contraceptive non-use, a categorical variable coded as 0 if the woman uses contraception and 1 if she is a non-user. IUD, Injectables, Implant, male and female condoms, Diaphragm, Lactational amenorrhea method, Male sterilization, Pill, Jelly foam, Injectables and Withdrawal were considered to be acceptable methods of modern contraceptive use. Traditional methods were not considered because of their high failure rate.

2.4.2 Explanatory variables

Table 1: Potential factors associated with the primary outcome were classified into the following

Variable Name	Type	Description
Age	Continuous	Age of participant
Partner's age	Continuous	Age of the participant's partner
Migration status	categorical	1 Non-migrant, 2 International Migrant and 3 Internal migrant
Marital status	Categorical	1 Never married, 2 Married, 3 Formerly married
Religion	Categorical	1 No religion, 2 Catholic, 3 Protestant, 4 Islam, 5 Other Christianity
Level of Education	Ordinal	0 no education, 1 primary, 2 secondary, 3 higher
Husband's education	Ordinal	1 primary, 2 secondary, 3 tertiary
Occupation	Categorical	1 Un-employed, 2 Agriculture, 3 Skilled labour, 4 Unskilled labour
Partner Occupation	Binary	0 Unemployed, 1 employed
Property ownership	Binary	0 No, 1 Yes
Access to health services	Binary	0 No, 1 Yes
Ability to refuse sex	Binary	0 No, 1 Yes
Desire to have children	Categorical	1 Have children in less than 2 years, 2 Have children in more than 2 years
Exposure to family planning information	Binary	0 No, 1 Yes
Age at first pregnancy	Continuous	
Participate in pregnancy decisions	Binary	0 No, 1 Yes
Age at first cohabitation	Continuous	
Participate in health decisions	Binary	0 No, 1 Yes

2.5 Data Management

Data management was performed in Stata IC version 15 (Stata Corporation, College Station, TX). The data were checked for duplicate ID numbers, and where duplicates were found they were deleted. New variables were created and labelled in Stata. Age was generated from two variables date of birth and date of questionnaire completion. Frequency tables were calculated to investigate the extent of missing values for the outcome variable. Observations for which the outcome variable was missing were deleted. All the data was de-identified and password protected.

2.6 Statistical analysis

The study aimed to investigate factors associated with contraceptive non-use. The main analysis was done using logistic regression and additional analysis was done using multilevel methods.

To meet objective 1: Descriptive analysis of the study population was performed as follows: Continuous variables were summarized as means (standard deviation). Categorical variables were summarized as frequencies and percentages. Frequency tables and bar graphs were used to display some summary statistics. The analysis was categorized by the levels of the outcome variable (contraceptive non-use or contraceptive use).

Objective 2 and 3: To determine factors associated with the outcome variable (contraceptive non-use), the analysis was done as follows

2.6.1 Logistic regression

Logistic regression was used for analysis as the response variable was classified into two categories: contraceptive non-use and contraceptive use. Logistic regression can detect changes in effect-size caused by adding new variables to the equation. Logistic regression models produce odds ratios that represent the effect of a one-unit change in the explanatory variable on the response variable. Odds ratios greater than one indicate a greater risk of contraceptive non-use while odds ratios smaller than one indicate a smaller risk of contraceptive non-use. A multivariable logistic regression model was fitted with all potential factors considered for inclusion in the model. Significant factors (p-value less than 0.25, with main explanatory variable migration status fixed) were selected using the backward elimination algorithm and used in the final model as recommended by Vittinghoff (51).

Secondly, additional analysis was carried out using multilevel models treating the 10 communities as clusters. Multilevel statistical analysis allows the modelling of both community level and individual level variability.

To identify common factors associated with contraceptive non-use in the six Southern African countries, all the data was combined into a single global dataset and a stepwise multilevel logistic regression was fitted. In step 1: A null model to estimate the probability of contraceptive non-use without adjustment for any factors was fitted.

$$\log \left(\frac{P_{ijk}}{1 - P_{ijk}} \right) = \beta_{0jk} \quad [1]$$

Where P_{ijk} is the binary indicator of contraceptive non-use for the i^{th} woman from the j^{th} community cluster and k^{th} sites. β is the intercept.

In step 2: A multi-level multivariable logistic regression model was then fitted with the community as random effects. The introduction of random effects at the different levels is to account for clustering as this data will be treated as 2 or higher-level data.

$$\log \left(\frac{P_{ijk}}{1 - P_{ijk}} \right) = x'_{ij}\beta + U_j \quad [2]$$

Where P_{ijk} is the binary indicator of contraceptive non-use for the i^{th} woman from the j^{th} community cluster.

X_{ij} represents different explanatory variables, these are grouped under socio-economic, societal, and behavioral.

β are the coefficients of each explanatory variable.

U_j is the random effect variable (site).

This model was adjusted for variables grouped into socio-economic, behavioral, and demographic factors. To investigate factors associated with contraceptive non-use within a country several multi-level models were fitted. The Wald χ^2 test will be utilized to determine significance. The Date of interview was used to estimate clusters for sensitivity analysis. It should be noted that with only 10 clusters and including random cluster level effects, the models can contain at most 8 terms.

2.7 Ethical Consideration

Ethical approval for the primary study was obtained from University of the Witwatersrand ethics committee. To analyze secondary data, permission was obtained from both the Principal investigator of the primary study and Witwatersrand Human Research Ethics Committee (HREC -M200553). To ensure confidentiality, data for each participant was de-identified.

3 CHAPTER 3: RESULTS

3.1 Introduction

This section describes the results of the study. The chapter begins by presenting the overall characteristics of the study population. It then proceeds to describe associations between background characteristics and contraceptive non-use using logistic regression analysis. The chapter ends with additional analysis using multilevel models.

3.2 Sample description

Table 2 summarises the characteristics of the study participants. Of the 1 242 eligible participants, 588 reported not having used any method of contraception representing a prevalence of 47.3%. Overall, 69% of the women were non-migrant, 19% were internal migrants while international migrants had the lowest proportion with 12%. Approximately 79% of the women were never married and 6% had been married before; 66% of the women were unemployed while a very low proportion (7%) had never attended school. About 85% of the women had no access to health services; 70% of the women participated in health decisions, while 92 % did not participate in decision about pregnancy, 28 % experienced partner violence and 20 % had no ability to refuse sex.

Table 2: Overall description of the study population

Characteristic	Level	n	%
Migration Stream	Non-migrant	856	69.1
	Internal Migrant	230	18.6
	International migrant	153	12.4
Socio demographics factors			
Age in years (n, mean, sd)		1242,19.4(2.9)	
Marital Status	Never married	975	78.9
	Married	188	15.2
	Married before	72	5.8
Religion	No religion	95	7.7
	Catholic	415	33.5
	Protestant	396	32.0
	Islam	24	1.9
	Other Christianity	309	25.0
Socio-Economic factors			
Education	Primary	321	25.9
	Secondary	671	54.2
	Higher	163	13.2
	No education	84	6.8
Occupation	Unemployed	817	65.9
	Agriculture	66	5.3
	Skilled Labor	50	4.0
	Unskilled labor	306	24.7
Education Partner	Primary	171	13.8
	Secondary	386	31.2
	Higher	119	9.60
	No education	563	45.4
Employment status Partner	Unemployed	67	8.6
	Employed	710	91.4
Type of settlement	Regular household	779	90.3
	Informal Settlement	83	8.1
Media Exposure	No	320	25.8
	Yes	919	74.1
Access to health services	No	1044	85.0
	Yes	185	15.0
Behavioural and Intimate partner violence factors			
Age at first sex in years (n, mean, sd)		826,16.7(2.1)	
Ever been pregnant	No	765	62.3
	Yes	474	37.5
Age at first pregnancy in years (n, mean, sd)		474,18.1(2.3)	
Age at first cohabitation in years (n, mean, sd)		335,18.4(2.1)	

Desire to have children	Have a child in less than 2 years	37	10.1
	Have a child in more than 2 years	167	45.4
	No more	143	38.9
	Unsure	21	5.7
Contraception Counselling	No	791	63.9
	Yes	488	36.2
Ability to refuse sex	No	162	19.9
	Yes	654	80.2
Experience partner violence	No	646	72.3
	Yes	248	27.7
Participant in pregnancy decision	No	393	92.3
	Yes	33	7.8
Participate in health decisions	No	305	29.7
	Yes	723	70.3

Table 2 summarises the distribution of several variables by contraceptive usage among women 15-24 years residing in six southern Africa countries. Contraceptive non-use was high among international migrants (56%) and lowest for internal migrants (38%). The average age of contraceptive non-users was lower 18 years and 20 years for women who used contraceptives. Contraceptive non-use was highest among never married women and lowest for previously married women. Contraceptive non-use was high among women with no education (70%). Non-use of contraception was high (54%) among unemployed women. Women whose partners were employed had a high contraceptive usage (72%). Contraceptive use was high among women who have access to some form of media (53%). Most women who had access to health services reported a high contraceptive usage (61%). Women who desired to have children in more than two years at the time of interviewing reported a high usage of contraceptive (86%). Most respondents reported that they started having sex and had their first pregnancy while below the age of 18 years. Contraceptive use was high among women who reported having the ability to refuse sex (65%), women who participated in discussions about pregnancy (64%) and health decision (66%).

Table 3: Contraceptive use and non-use by explanatory variables among women aged 15-24 in six Southern African countries.

		Contraception Utilization			
		User		Non-User	
		n	%	n	%
Characteristic	Level				
Migration Stream	Non-migrant	433	51.8	413	48.3
	Internal Migrant	141	61.3	89	38.7
	International migrant	67	43.7	86	56.2
Socio demographics factors					
Age in years (n, mean, sd)		651, 20.6(2.5)		588, 18.1(2.7)	
Marital Status	Never married	448	46	527	54.1
	Married	143	76.1	45	23.9
	Married before	60	83.33	12	16.7
Religion	No religion	46	48.4	49	51.6
	Catholic	215	51.8	200	48.1
	Protestant	206	52	190	48
	Islam	11	45.9	13	54.2
	Other Christianity	73	56	136	44
Partner Age in years (n, mean, sd)		469,25.2(5.4)		176,23.4(5)	
Socio Economic factors					
Education	Primary	174	54.2	147	45.8
	Secondary	360	53.7	311	46.4
	Higher	92	56.4	71	43.6
	No education	25	29.8	59	70.2
Occupation	Unemployed	372	45.5	445	54.5
	Agriculture	33	50	33	50
	Skilled Labor	31	62	19	38
	Unskilled Labor	215	70.3	91	29.7
Education Partner	Primary	124	72.5	47	27.5
	Secondary	281	72.8	105	27.2
	Higher	85	71.43	34	28.6
	No education	161	28.6	402	71.4
Employment status Partner	Unemployed	33	49.3	34	50.8
	Employed	511	72	199	28
Type of settlement	Regular household	386	49.6	393	50.5
	Informal Settlement	39	51.3	37	48.7
	Shabeen	5	71.4	2	28.6
Media Exposure	No	168	52.5	152	47.5
	Yes	483	52.6	436	47.5

Access to health services	No	534	51.2	510	48.9
	Yes	112	60.54	73	39.5
Behavioural and Intimate partner violence factors					
Age at first sex in years (n, mean, sd)		627,16.7(2.1)		199,16.7(2.1)	
Ever been pregnant	No	273	35.7	492	64.3
	Yes	378	80.1	94	20
Age at first pregnancy in years (n, mean, sd)		378,18.2(2.4)		94,17.3(2.20)	
Age at first cohabitation in years (n, mean, sd)		267,18.4(2.16)		67,18.5(3.6)	
Desire to have children	Have a child in less than 2 years	33	89.2	4	10.8
	Have a child in more than 2 years	143	85.6	24	14.4
	No more	114	79.8	29	20.3
	Unsure	16	76.2	5	23.8
Contraception Counselling	No	203	25.7	588	74.4
	Yes	448	100	0	0
Ability to refuse sex	No	85	52.5	77	47.5
	Yes	428	65.4	226	34.6
Experience partner violence	No	421	65.2	225	34.8
	Yes	177	71.4	71	28.6
Participant in pregnancy decision	No	97	24.7	296	75.3
	Yes	21	63.6	12	36.4
Participate in health decisions	No	131	43	174	57.1
	Yes	497	66.3	224	33.8

3.3 Country-level description of the data

Respondents in this study came from 6 SSA countries, and were sampled from two sites in Malawi, Zambia, Mozambique, and South Africa, but only one site in each of Lesotho and Eswatini; 25 % were from Malawi, 21 % from both Zambia and South Africa (Table 4). The lowest percentage was from Lesotho and Swaziland with both countries only having 8% of respondents.

Table 4: Distribution of young women across the six African countries

Country	N (1242)	Percent (%)
Lesotho	102	8.2
Malawi	312	25.1
Mozambique	217	17.5
South Africa	255	20.5
Swaziland	95	7.7
Zambia	261	21.0

3.4 Contraceptive use of respondents by their country of residence

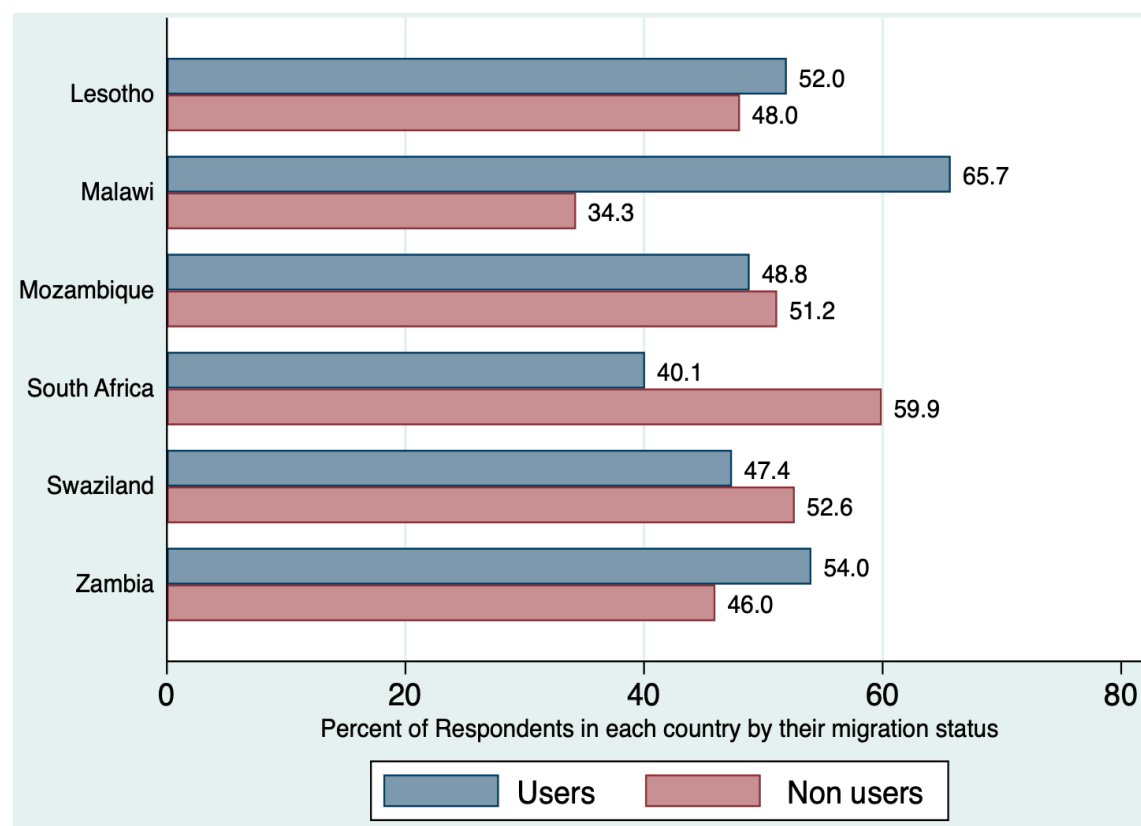


Figure 2: Distribution of contraceptive usage among young women

Figure 2 shows the distribution of contraceptive usage in each country. The highest proportion of contraceptive non-users was observed in South Africa (59.9%) followed by Swaziland (52.6%) while the lowest proportion was observed in Malawi with 34.3%.

3.5 Individual-level factors associated with contraceptive non-use

Table 5: Factors associated with contraceptive non-use among women aged 15-24 years.

Characteristic	Level	Crude Odds Ratio (95% CI)	p-value
Migration Stream	[Non-migrant]	1	0.0026
	Internal Migrant	0.68(0.50, 0.91)	
	International migrant	1.38(0.97,1.94)	
Socio demographics factors			
Age (per year increase)		0.71(0.67,0.71)	<0.0001
Marital Status	[Never married]	1	<0.0001
	Married	0.27(0.19,0.38)	
	Married before	0.17(0.09,0.32)	
Religion	[Catholic]	1	0.6131
	No religion	1.15(0.73,1.79)	
	Protestant	0.99(0.75,1.31)	
	Islam	1.27(0.56,2.90)	
	Other Christianity	0.85(0.63,1.14)	
Partner Age difference		0.97(0.93,1.01)	0.073
Socio Economic factors			
Education	[Secondary]	1	0.0005
	No education	2.73(1.67,4.46)	
	Primary	0.98(0.75,1.28)	
	Higher	0.90(0.63,1.26)	
Occupation	[Unemployed]	1	<0.0001
	Agriculture	2.73(1.67,4.46)	
	Skilled Labor	0.98(0.75,1.28)	
	Unskilled labor	0.89(0.63,1.26)	
Education Partner	[No education]	1	<0.0001
	Primary	0.15(0.10,0.22)	
	Secondary	0.15(0.11,0.20)	
	Higher	0.16(0.10,0.25)	
Occupation Partner	[Unemployed]	1	0.0002
	Employed	0.38(0.23,0.63)	
Media Exposure	[Yes]	1	0.9859
	No	1.00(0.78,1.29)	
Access to health services	[Yes]	1	0.0188
	No	1.47(1.07,2.02)	
Behavioural and Intimate partner violence factors			
Age at first sex (per year increase)		1.01(0.95,1.08)	0.7129
Ever been pregnant	[No]		<0.0001

	Yes	0.14(0.11,0.18)	
Age at first pregnancy (per year increase)		0.96(0.87,1.06)	0.4056
Age at first cohabitation (per year increase)		1.02(0.97,1.08)	0.3955
Desire to have children	[Have a child in > 2 years]	1	0.3138
	Have a child in < t 2 years	0.77(0.23,2.23)	
	No more	1.52(0.84,2.75)	
	Unsure	1.86(0.62,5.56)	
Ability to refuse sex	[Yes]	1	0.0024
	No	1.72(1.21,2.43)	
Participant in pregnancy decision	[Yes]	1	<0.0001
	No	1.68(0.93,2.42)	
Participate in health decisions	[No]	1	<0.0001
	Yes	0.38(0.29, 0.50)	

Unadjusted logistic regression models were fitted to determine the association of contraceptive non-use with the key explanatory variable, migration stream, as well as with the socio-demographic, socio-economic and behavioural variables. The odds of contraceptive non-use was 62% higher among international migrant women while 33% lower among internal migrants compared to non-migrant women. Compared to women with some level of education, the odds of contraceptive non-use was high among women with no education (OR=2.731). The odds of contraceptive non-use was 1.7 times more for women who had no ability refuse sex compared to those who could refuse sex. The odds of contraceptive non-use was lower among women who participated in decisions about their health (OR=0.38). This association was statistically significant (Table 5). Demographic and socio-economic factors such as marital status, occupation, age, level of education, access to health services and contraceptives, participate in pregnancy related decisions, and ability to refuse sex, as shown in Table 7 were significantly associated with modern contraceptive non-use ($p < 0.05$).

3.6 Multivariate analysis of factors associated with contraceptive non-use

To investigate factors associated with contraceptive non-use, three multivariable logistic regression models were fitted as follows: Model I, investigated the association between socio-demographics factors and contraceptive non-use. Model II investigated the joint effect of socio-economic factors and behavioural factors with contraceptive non-use. In Model III, using stepwise forward and backward regression, variables were selected for the final model. The variable selection step also included the main explanatory variable migration stream and a few important variables reported in literature namely age, marital status, religion, education and employment were included in the model irrespective of the statistical significance. A 0.25 p-value cut-off was used as recommended by Vittinghoff (51).

Table 6: Multivariable logistic regression analysis investigating associations between socio-demographic factors and contraceptive non-use.

		Model 1	
Characteristic	Level	Adjusted Odds ratio (95% CI)	p-value
Migration Stream	[Non-migrant]	1	0.0445
	Internal Migrant	0.71(0.41,1.2)	
	International migrant	1.42(0.77,2.58)	
Country	[Malawi]	1	<0.0001
	Lesotho	8.74(4.17,18.93)	
	Mozambique	1.77(0.83,3.73)	
	South Africa	3.19(1.42,6.84)	
	Swaziland	9.67(4.25,22.19)	
	Zambia	1.26(0.60,2.32)	
Socio demographics factors			
Age (per year increase)		0.75(0.69,0.82)	<0.0001
Marital Status	[Never married]	1	0.5630
	Married	1.40(0.78,2.22)	
	Married before	1.48(0.50, 2.93)	
Religion	No religion	1.08(0.48, 2.45)	0.0020
	[Catholic]	1	
	Protestant	2.60 (1.32,3.85)	
	Islam	3.01(0.82,10.99)	
	Other Christianity	0.77(0.44, 1.33)	
Partner age difference (per year increase)		0.96(0.92,1.01)	<0.0001

Model I (Table 6) investigated the joint effects of migration stream and socio-demographic factors. The odds of contraceptives non-use was reduced by approximately 30% among internal migrant women and for international migrants, the odds of contraceptive non-use was 1.42 times more compared to non-migrant women. This association was statistically significant ($p < 0.05$). There was strong evidence ($p < 0.05$) that contraceptive non-use was associated with age; for every year increase in age the odds of contraceptive non-use decreased by 15%. There was also strong evidence ($p < 0.05$) that partner's age difference was associated with contraceptive non-use, as the difference in age increased the odds of contraceptive non-use increased.

Table 7: Multivariable logistic regression analysis investigating associations between socio-economic factors, and behavioural factors and contraceptive non-use.

		Model II	
Characteristic	Level	Adjusted Odds ratio (95% CI)	p-value
Migration Stream	[Non-migrant]	1	0.0565
	Internal Migrant	0.43(0.11,1.66)	
	International migrant	5.35(0.98,29.14)	
Country	[Malawi]	1	0.0159
	Lesotho	16.92(2.51,114.127)	
	Mozambique	3.54(0.80,15.71)	
	South Africa	0.39(0.03,6.07)	
	Swaziland	3.51(0.50,24.57)	
	Zambia	0.76(0.16,3.57)	
Education	[Secondary]	1	0.5708
	No education	4.53(0.25,81.35)	
	Primary	2.15(0.08,58.28)	
	Higher	1.60 (0.07,38.19)	
Occupation	[Unemployed]	1	0.0088
	Agriculture	0.80(0.16,3.93)	
	Skilled Labor	0.78(0.09,6.52)	
	Unskilled labor	0.15(0.04,0.52)	
Education Partner	[No education]	1	0.6335
	Primary	1.19(0.10,14.65)	
	Secondary	3.07(0.26,36.97)	
	Higher		
Occupation Partner	[Unemployed]	1	0.0007
	Employed	2.53(0.18,30.58)	
Media Exposure	[Yes]	1	0.8769
	No	0.92(0.33,255)	
Access to health services	[Yes]	1	0.4723
	No	1.61(0.34,7.74)	
Behavioural and Intimate partner violence factors			
Age at first sex (per year increase)		1.164(0.91,1.49)	0.0098
Age at first pregnancy (per year increase)		0.85(0.64,1.12)	<0.0001
Age at first cohabitation (per year increase)		0.99(0.87,1.13)	
Ability to refuse sex	[Yes]	1	<0.0001
	No	2.10(0.54, 7.51)	
Participate in health decisions	[No]	1	0.0055
	Yes	0.18(0.05,0.76)	

Model II (Table 7) investigated the joint effects of migration stream, socio-economic factors, and behavioural factors. There was strong evidence ($p < 0.05$) that contraceptive non-use was associated with occupation. The odds of contraceptive non-use was lower among employed women compared to their unemployed counterparts. There was strong evidence ($p < 0.05$) that occupation of a partner was associated with contraceptive non-use. The odds of contraceptive non-use for women whose partners were unemployed were 2.53 times more compared to women who had employed partners. Women with no access to health services were 39% more likely not to use contraceptives compared to women with some access to health services. The odds of contraceptives non-use was 2.10 times higher for women who could not refuse sex compared to women who could refuse sex. There was also strong evidence ($p < 0.05$) that contraceptive non-use was associated with women's ability to make health decisions. The odds of contraceptive non-use was 0.18 times lower for women who participated in decision making about their health compared to those women who did not.

Table 8: Multivariable logistic regression analysis investigating the joint effects of socio-demographics, socioeconomics, and behavioural factors and contraceptive non-use.

		Model III	
Characteristic	Level	Adjusted Odds ratio (95% CI)	p-value
Migration Stream	[Non-migrant]	1	0.2015
	Internal Migrant	0.78(0.50,1.22)	
	International migrant	1.38(0.84,2.30)	
Country	[Malawi]	1	<0.0001
	Lesotho	2.65(1.45,4.82)	
	Mozambique	1.03(0.59,1.81)	
	South Africa	1.51(0.79,1.91)	
	Swaziland	1.69(0.92,3.09)	
	Zambia	1.39(0.76,1.84)	
Socio demographics factors			
Age (per year increase)		0.75(0.69,0.81)	<0.0001
Marital Status	[Never married]	1	0.1582
	Married	0.66(0.40,1.08)	
	Married before	0.58(0.25,1.33)	
Religion	[No religion]		0.0004
	Catholic	1.75(0.81,3.77)	
	Protestant	2.58(1.18,5.68)	
	Islam	4.62(1.36,15.73)	
	Other Christianity	0.93(0.43,2.01)	
Socio Economic factors			
Education	[Secondary]	1	0.0719
	No education	2.71(1.30,5.73)	
	Primary	1.03(0.68,1.57)	
	Higher	0.97(0.55,1.72)	
Occupation	[Unemployed]	1	0.2022
	Agriculture	1.20(0.57,2.52)	
	Skilled Labor	0.74(0.37,1.50)	
	Unskilled labor	0.68(0.45,1.03)	
Ability to refuse sex	[Yes]	1	<0.0001
	No	1.39(0.92,2.11)	

Model III (Table 8) investigated the joint effects of migration stream, county, socio-demographics, socioeconomics, and behavioural factors. The odds of contraceptive non-use reduced for international migrants (AOR 1.38) compared to model II. There was strong evidence ($p < 0.05$) that contraceptive non-use was associated with age of the participant. For each year increase in age the odds of contraceptive non-use reduced. Compared to women with

higher levels of education, the odds of contraceptive non-use was 2.81 times higher for women with no education. Although this was marginally significant ($p=0.0719$). There was strong evidence ($p<0.05$) that contraceptive non-use was associated with the ability to refuse sex. The odds of contraceptive non-use was 1.54 times higher among women who could not refuse sex compared to women who could refuse sex.

Additional analysis was performed using multilevel models. These models provide estimates of the unexplained variance in the outcome that is due to unobserved community factors, generally known as the random effect. Annex A shows the fixed effect factors associated with contraceptive non-use using communities (10 study sites) as random effects. Age, religion, and ability to refuse sex were also found to be statistically significant ($p<0.05$).

3.7 Checking possible interactions

Possible interactions could be from the level of education and occupation, age and media exposure, age and marital status, access to health services and age. No interaction was found to be statistically significant. Some expected interactions were not found to be statistically significant. In part this could be due to the sample size being too small to detect interaction effects.

3.8 Evaluating the goodness of fit for the final model

To understand the model that was used to investigate factors associated with contraceptive non-use, predicted probabilities were calculated for a few selected factors.

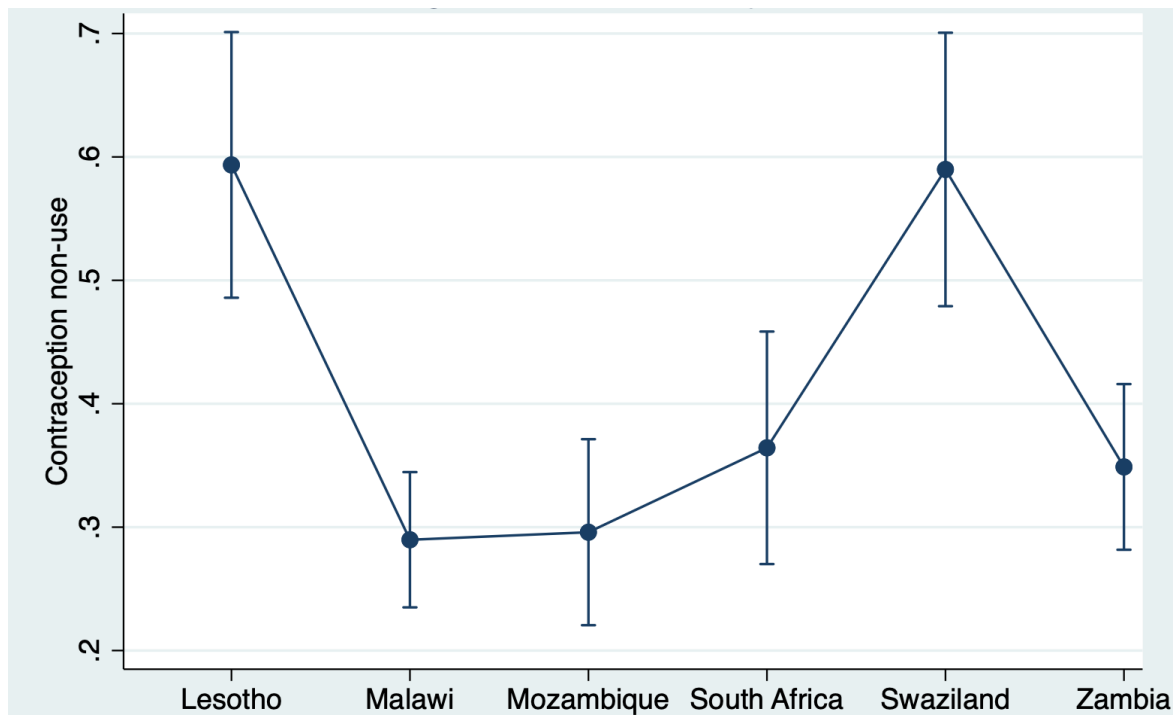


Figure 3: Calculated probabilities for contraceptive non-use across the six southern Africa countries

The likelihood of contraceptive non-use was highest in Lesotho, followed by Swaziland and it was lowest in Malawi (Figure 3). Mozambique, South Africa and Zambia had similar profiles for contraceptive non-use (Figure 3).

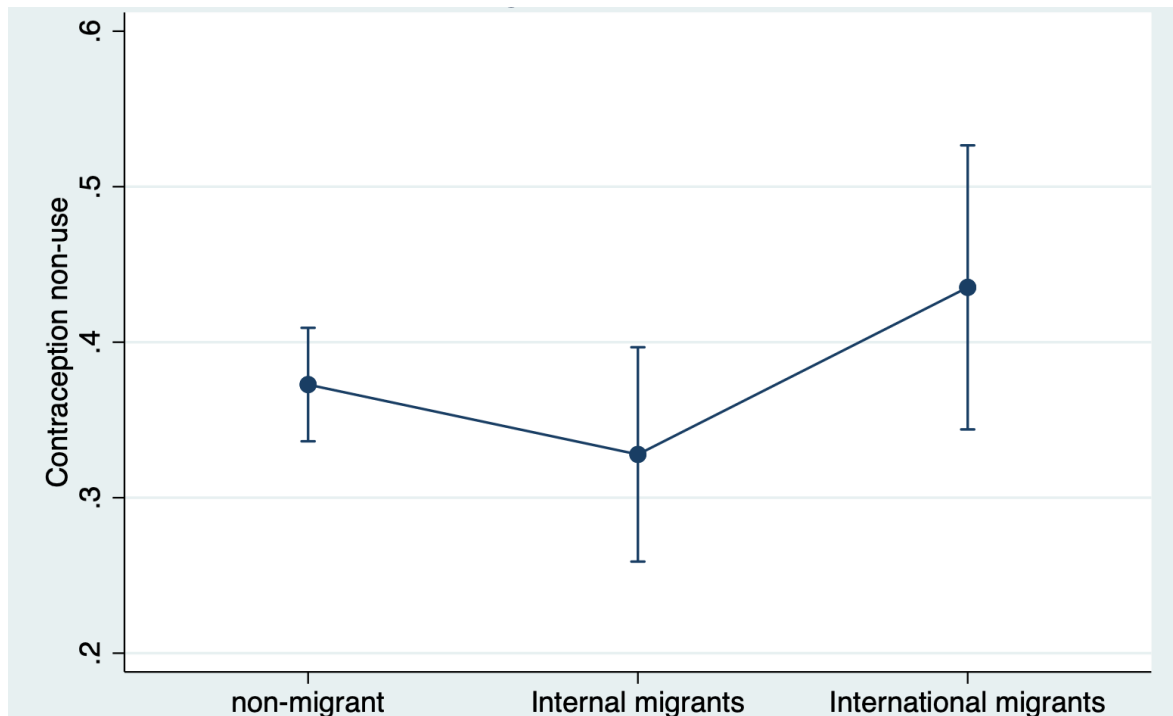


Figure 4: Calculated probabilities for contraceptive non-use by migration status.

The likelihood of contraceptive non-use was high among international migrants and low among internal migrants (Figure 4).

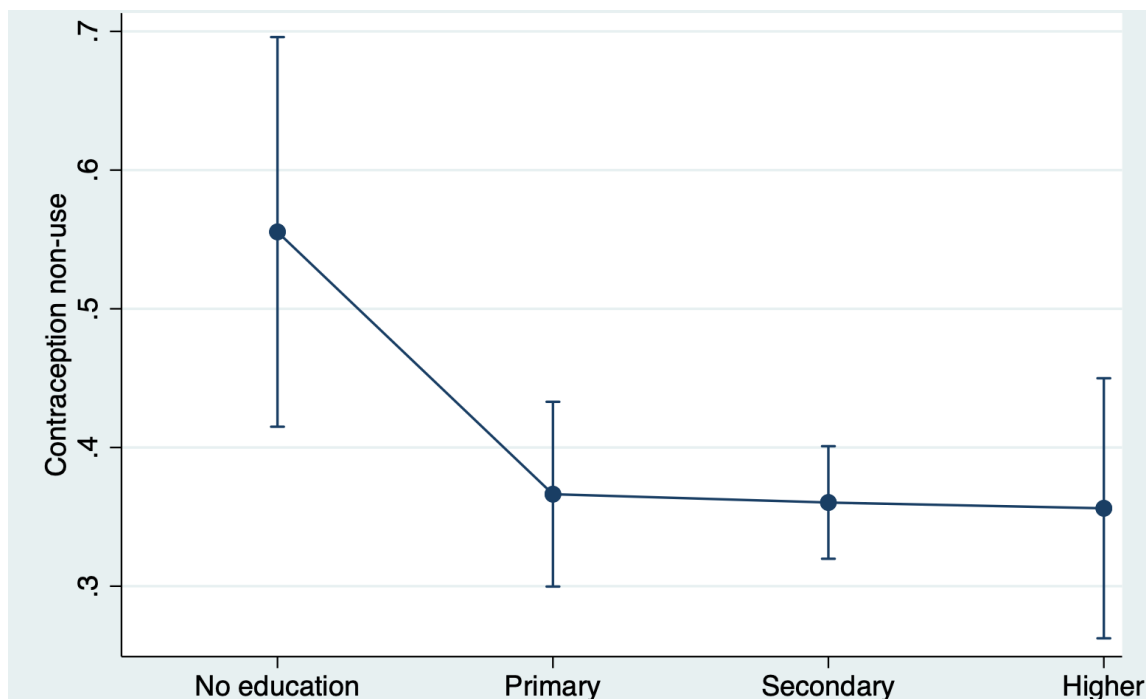


Figure 5: Calculated probabilities for contraceptive non-use across level of education

In general women with no education had the highest odds of contraceptive non-use (Figure 4) and having some form of education reduced the likelihood of contraceptive non-use among young women.

To evaluate the fit of the model (Model III) that was used to identify factors associated with contraceptive non-use, two questions were asked:

- i) Is the logistic model formulation a reasonable fit? This was assessed using the Hosmer-Lemeshow test for the overall goodness of fit.
- ii) Should a different model be fit? This was assessed using the Link test

The goodness of fit Hosmer-Lemeshow test had a p-value of 0.1030, this means that there is not enough evidence to suggest a lack of fit. The logistic regression model fitted could be considered a reasonable fit.

Table 9 : Goodness of fit for the test used to investigate factors associated with contraceptive non-use

Outcome	Coef	Std. Err	z	P>z	[95% Conf. Interval]	
hat	1.03591	0.1113596	9.30	0.000	0.8176537	1.254175
hatsq	0.03694	0.0685846	-0.54	0.590	-0.0974772	0.171369
cons	-0.02317	0.1446856	-0.23	0.815	-0.2175987	0.171249

The Link Test (p= 0.590) suggests no statistically significant departure from model adequacy.

3.9 Summary of the Chapter

Three multivariable logistic regression models were fitted to investigate the association of contraceptive non-use with demographic, socioeconomic and behavioural factors. Using multivariable logistic regression, age, religion, and ability to refuse sex were found to be strongly associated with contraceptive non-use. Contraceptive non-use decreased with increasing age (aOR 0.75, 95% CI 0.69,0.81), was higher for women unable to refuse sex (aOR 1.39, 95% CI 0.92,2.11). Contraceptive non-use was also higher among young women of Catholic (aOR 1.75, 95% CI 0.81,3.77) , Protestant (aOR 2.58, 95% CI 1.18,5.68), Islam (aOR 4.62, 95% CI 1.36,15.73) religions.

4 CHAPTER 4: DISCUSSION

4.1 Introduction

This study investigated factors associated with contraceptive non-use among young women aged (15-24 years) living in high migrant communities in six southern African countries. The findings of the study are discussed below.

4.2 Knowledge and usage of contraceptive methods

Overall, the prevalence of contraceptive non-use in this study was 47%. This finding is similar to a study which indicated that approximately 50% of young people aged 15-24 years were not using contraceptives (52). Knowledge of methods of contraception is one of the indicators which can be used to understand constraints on contraceptive usage, the social context of fertility, and reproductive health of young women (53). In this study, 88% of young women knew about male condoms while 78 % knew about injectable contraceptives. Similar findings were observed in a study conducted to determine adolescent and young adult knowledge of contraceptives, where it was reported that 89% knew about condoms and 73% knew about injectables (54).

A study conducted in Ghana among migrant adolescent girls indicated a high knowledge of contraceptives but low usage, a finding consistent with results reported in this study among adolescents living in high migrant communities (55). In South Africa, a study of adolescents found that despite knowing about contraception, risks of unwanted pregnancy and sexually transmitted infections, many female adolescents continued to engage in unprotected sex (56). Similarly, in this study most of the participants had knowledge of contraception, however, the rate of contraceptive use was low with over 88% of participants reporting knowing about male condoms but a small percentage (4%) reported using them. This percentage is also similar to the level of adolescents' contraceptive knowledge in Asia, North Africa, the Caribbean, and Latin America, where the level of adolescents' knowledge on contraceptives is above 90% (55). Although marginally different, similar results were reported in a survey conducted among women aged 13-24 years where the knowledge of contraceptives was high but usage was low with approximately 2.6% using IUD (54).

Despite young women being knowledgeable about contraception, the low usage observed may be attributed to many negative beliefs such as impotence after condom use, weakness after sterilization, and fear of becoming obese (57). Also (55) suggested that young women who have more knowledge about different contraceptives are those residing in urban areas or those residing in households where a radio or television is accessible (55). In this study, similar findings were reported where the major sources of contraceptive information were government hospitals (71%), government healthcare centres (49%), schools (30%), radio (23 %) and television (17 %).

4.3 Factors associated with contraceptive non-use

4.3.1 Socio-demographic factors and contraceptive non-use

This study investigated factors associated with contraceptive non-use in six high migrant communities. Migration stream, one of the main explanatory variables was divided into three categories (Non-migrants, Internal migrants, and international migrants). Multivariable logistic regression analysis showed that migration stream was not associated with contraceptive non-use after adjusting for other factors. The analysis, however, showed that international migrants had higher odds of contraceptive non-use. These results are similar to other studies which found non-migrant women to have better contraceptive usage (17,58). In SSA, migration is associated with contraceptive non-use differently (26). The higher odds of contraceptive non-use among international migrants may be attributed to migrant women having a tendency to change their characteristics and adopting those of their place of destination (59). Migration occurring across multiple locations can cause attitude and behavioural changes among women which may affect their usage of contraception (26).

In this study, some socio demographic, socio-economic, and behavioural factors were significantly associated with contraceptive non-use among adolescents (15-19 years) in six high migrant SSA countries. Age was significantly associated with contraceptive non-use, with the odds of non-use decreasing with increasing age. There is also an assumption that women aged 20–24 years have a good understanding of the consequences associated with engaging in unprotected sexual intercourse compared to adolescents. Perhaps, this is because women aged

20-24 years are more mature and informed regarding available methods of contraception and the consequence of contraceptive non-use, compared to younger female adolescents (15-19 years) who may not have enough knowledge on contraception usage. Therefore, a gradual reduction in contraceptive non-use is observed for every year, a finding reported in this study.

Adolescents (15– 19) years who get married early and are new to the marital institution may mistakenly perceive marriage as a childbearing institution. Also, young women may encounter difficulties in accessing contraception as they might have limited information on where to access them or may not be able to afford the services. In South Africa, research conducted found that in some cases personal and cultural beliefs of healthcare providers led to denial and inconsistent provision of reproductive health services to adolescent girls (54). In a study conducted in the Democratic Republic of Congo, it was noted that 20–24-year-old young women were more likely to receive contraceptive information from healthcare providers than adolescents (15–19) (60). Findings from this study are similar to findings in a study conducted in Uganda and Ethiopia where reduced contraceptive usage was observed among adolescents (15-19) compared to young women aged 20-24 years (61). In a study conducted in Zimbabwe, contraceptive use among adolescent women increased with age (62) .

Among socio-demographic factors, there was strong evidence that marital status was associated with contraceptive non-use. The odds of contraceptive non-use was 64% lower for married and 70% lower for formerly married women compared to never married women. Similarly, a study conducted in Senegal reported use of any method of contraception was lower among married women compared to unmarried and sexually active women (63). In cross-sectional study conducted in 29 African countries, compared to never married and formerly married, married young women were more likely to have an unintended pregnancy(64). In contrast, a study conducted in 73 LMICs on contraception reported low usage among female adolescents who were married (65). In another study, an important relationship between marital status and the use of contraception was reported among young women (66). In general, SSA shows a lot of variation when contraceptive use is considered by marital status.

Having a strong religious identity affects the willingness of young women to discuss contraception with either their families or partners. This extends to young women's unwillingness to consider accessing and ultimately using contraception. Institutionalized religious doctrines intersecting with cultural beliefs embedded in a society influence the use of

contraception among women. In this study, Muslim young women had the highest odds of contraceptive non-use compared to their non-religious counterparts. Similarly, in a Malawian study conducted to investigate factors associated with contraceptive usage among young women 15-24 years, it was found that Muslim young women had a lower odds of contraceptive use compared to Catholic women (67). Again, compared to women of the Catholic faith, Muslim women were less likely to use any method of contraception(17). In another study, being a Muslim woman was found to be negatively associated with contraceptive use (68). A study investigating religion and ethnicity among women of reproductive age found that the odds of contraceptive use was higher among Catholics, other Christians compared to Muslim women (67).

4.3.2 Socio Economic status and contraceptive non-use

In this study, the level of education attained by young women was significantly associated with contraceptive non-use. Women who had attained primary, secondary, and higher levels of education had lower odds of contraceptive non-use compared to those with no formal education. These results are similar and consistent with other studies that have reported a similar relationship between contraception usage and level of education. Compared to uneducated women, educated young women are exposed to reproductive health information which enables them to make autonomous decisions regarding their reproductive health needs (7). Adolescent girls who are educated have a better understanding of the consequences associated with contraceptive non-use such as unintended pregnancies than women with no education (7). A survey of adolescents and young women aged 15-24 years conducted in South Africa found that being a student (that is having some form of education) reduced the likelihood of contraceptive non-use (34). Similarly, another study found that higher levels of education were associated with contraceptive use particularly condoms (55). This pattern appears to be consistent across SSA as data from 20 SSA countries found that adolescents and young women with a higher level of education reported using condoms more frequently (69). In societies with high levels of education, pregnancy and childbearing tend to occur at a later stage, and therefore the need for contraceptive methods increases. Thus, it is important for policymakers to develop reproductive health interventions that address the reproductive health needs of women targeting different subgroups of young women. This can be extended to include policies that promote the education of adolescents and young women.

Overall, employment status was associated with contraceptive non-use among young women. The odds of contraceptive non-use was low among employed young women compared to those unemployed. Employed young women may be preoccupied with work-related activities such as growing their careers rather than having babies. Also employed young women are likely to have some form of formal education, to be more exposed to information on contraception and are more likely to be able to afford contraceptives than their unemployed counterparts. This pattern even extended to partner occupation where the odds of contraceptive non-use was low among adolescents whose partners were employed as compared to those with unemployed partners. This is consistent with studies that found that the odds of non-use of any method of contraception is low among employed women (67,69).

In this study, access to health services was found to be associated with contraceptive non-use. The study found 54% higher odds of contraceptive non-use among young women who have no access to health services. Our findings concur with a study conducted in Ethiopia which reported a 54% higher odds of contraceptive use among those women who visited a health facility (70). In another study it was also observed that the odds of contraceptive non-use was low among female adolescents who received a visit by family planning field workers compared to their counterparts who were not visited (71). This suggests that a visit to health facilities or being visited by a health service provider can improve the use of contraception among female adolescents. In South Africa, a study found that youth from higher socio-economic status groups who are likely to have access to health services, had a lower odds of contraceptive non-use, than those from lower socio economic-status (34). In Kenya, it was reported that the odds of contraceptive non-use was low among young women coming from wealthier families compared to their less well-off counterparts (72).

4.3.3 Behavioural factors and contraceptive non-use

Among behavioural factors, age at first cohabitation and the ability to refuse sex were significantly associated with contraceptive non-use. In a study conducted in South Africa, women who could not refuse sex were twice more likely not to use any method of contraception, consistent with findings of another study conducted among women (34). In this study, it was observed that the odds of contraceptive non-use was high among young women who have older male partners compared to those with younger partners. This can be attributed to the fact that once women are in a union, then societal pressure dictates that they must bear

children while some cultures require that they demonstrate their capability of continuing their partner's lineage. This is reinforced by studies that found that having a sexual partner who is 5 or more years older than the woman is associated with higher odds of contraceptive non-use compared to having a sexual partner within one's age range. Furthermore, epidemiologic studies investigating relationships and usage of contraception found a strong association between the type of relationship and contraceptive decision-making (73). For example, it was observed that the use of contraception could be negotiated if the age gap between partners is not greater than 5 years as this was linked to gender-power dynamics (73).

Understanding contraception non-use among young women aged 15-24 years is of paramount importance in forming part of a multifactorial approach towards improving the lives of young women. This study helped to provide some valuable insights on the factors that are associated with contraceptive non-use which can be incorporated in broader policy frameworks which amongst other things aim to improve the reproductive health and lives of young women overall.

4.4 Limitations

This study has some limitations and should be interpreted with caution. The study utilized secondary data from the baseline cross-sectional survey of a longitudinal study. This precludes causal relationships between factors and contraception non-use. The data is from 10 communities in six southern Africa countries, the 10 communities were not randomly chosen and hence may not be representative even of the six countries, ideally village identification would have been more appropriate to use. In addition, the analysis was based on self-reported information that may be influenced by recall and social desirability bias. Despite these limitations this study provides useful insights into factors associated with contraceptive non-use amongst adolescent women 15-24 years residing in high migrant communities in six SSA countries. The strength of this study is that it adds to the current scientific discourse on reproductive health of women aged 15-24 years residing in high migration communities.

5 CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the conclusions of the study findings and provides recommendation.

5.2 Conclusions

The findings of this study highlighted the influence of age, marital status, education, religion, employment, and access to health as the key factors associated with contraceptive non-use among young women in high migrant communities in six SSA countries. These factors were however found not to differ by migration status. The findings should be articulated and reflected in public health policy planning intended to address barriers to the access and use of contraception by young women residing in migrant communities. Interventions should be tailored according to factors such as women's educational level, marital status and their migration status. There is also a need to strengthen age specific socio-behavioural norms to prevent and or in some instances delay early sexual activities and unplanned pregnancies until adolescent women have sufficient information to make informed decision regarding their sexual and reproductive health. Male partners have been associated with contraceptive usage amongst young women. Thus, it is critical that males form part of the discourse and solution for the utilization of contraceptive methods and this should be reflected in various policies and interventions. As the adolescent and young women populations continue to grow, it is important for governments to develop and implement more effective strategies to improve contraceptive usage and eliminate any existing barriers.

5.3 Recommendations

This study has highlighted factors influencing contraceptive non-use among young women residing in high migrant communities of six SSA countries. These are some recommendations that can be implemented, monitored and evaluated using various policy frameworks.

5.3.1 Policy and research recommendations

Reproductive health programs should be intensified to meet the needs of young women and these should take into consideration different cultural perspectives. Programs intended to improve contraceptive use should increase outreach to younger women who may have limited access to information. For instance, provision of health education at schools is another way to equip young women with this much needed information. If such outreach programs are expanded to include community and parental involvement then these programmes would enable parents to directly participate in their children's health education.

There is a need to develop youth friendly health services to make it simpler for young women to access sexual and reproductive health services as needed. Community health workers may be utilised to increase access to contraceptive services for young women, provided services are properly regulated and high quality standards are maintained. Given that each country is unique this will need to be adapted to particular contexts.

In general, government and several other stakeholders should play a key role to improve access to educational opportunities for young women, which can be extended to include education on the need to use health facilities particularly among sexually active female young women.

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APPENDICES

ANNEX A : Fixed effects results from multi-level modelling

Characteristic	Level	Model 1	Model II	Model III	p-value
		Odds ratio (95% CI)	Odds ratio (95% CI)	Odds ratio (95% CI)	
Migration Stream	[Non-migrant]	1	1	1	0.6969
	Internal Migrant	0.73(0.44,1.22)	0.70(0.17,2.92)	1.02(0.68,1.55)	
	International migrant	1.40(0.78,2.50)	5.55(0.78,39.70)	1.23(0.76,2.00)	
Socio demographics factors					
Age (per year increase)		0.77(0.70,0.84)			<0.0001
Marital Status	[Never married]	1		1	<0.0001
	Married	1.14(0.66,1.90)		0.36(0.23,0.57)	
	Married before	0.98(0.40, 2.40)		0.30(0.14,0.66)	
Religion	[Catholic]	1			0.020
	Protestant	1.47(0.63, 3.38)			
	Islam	2.24 (1.30,3.38)			
	Other Christianity	2.87(0.79,10.16)			
Partner Age difference (per year increase)		0.97(0.93,1.01)			<0.0001
Socio Economic factors					
Education	[Secondary]		1	1	0.2894
	No education		1.20(0.05,33.32)	1.81(0.87,3.79)	
	Primary		1.67(0.04,80.89)	1.22(0.82,1.83)	
	Higher		1.27 (0.04,38.28)	0.85(0.50,1.46)	
Occupation	[Unemployed]		1	1	0.0015
	Agriculture		0.57(0.10,3.34)	0.87(0.43,1.74)	
	Skilled Labor		1.36(0.15,12.07)	0.73(0.36,1.49)	
	Unskilled labor		0.17(0.04,0.61)	0.47(0.32,0.69)	
Education Partner	[No education]		1		0.7518
	Primary		1.10(0.05,21.40)		
	Secondary		2.62(0.17,45.88)		
	Higher				
Occupation Partner	[Unemployed]		1		0.0025
	Employed		1.35(0.08,21.73)		
Behavioural and Intimate partner violence factors					
Age at first sex (per year increase)			1.12(0.90,1.42)		0.0377
Age at first pregnancy (per year increase)			0.92(0.70,1.22)		<0.0001
Age at first cohabitation (per year increase)			1.01(0.87,1.16)		<0.0001
Ability to refuse sex	[Yes]		1	1	<0.0001
	No		1.76(0.43, 8.12)	1.54(1.04,2.29)	
Participate in health decisions	[No]		1		0.0182
	Yes		0.22(0.06,0.86)		

ANNEX B : Comparison of multilevel regression models

	Model O	Model I	Model II	Model III
ICC	56.4%	42.3%	17.9%	9.1%
AIC	1649.618	689.817	180.8877	1012.891

ANNEX C: Distribution of different contraceptive methods

Contraceptive method	Percentage (%)
Female sterilization	0.4
Male sterilization	0.08
IUD	0.56
Injectables	17.17
Implant	5.23
Pill	4.03
Male condom	4.03
Female condom	4.11
Diaphragm	0.24
Jelly Foam	0.32
Standard days method	0.97
Lactational amenorrhea method	0.97
withdrawal	3.62

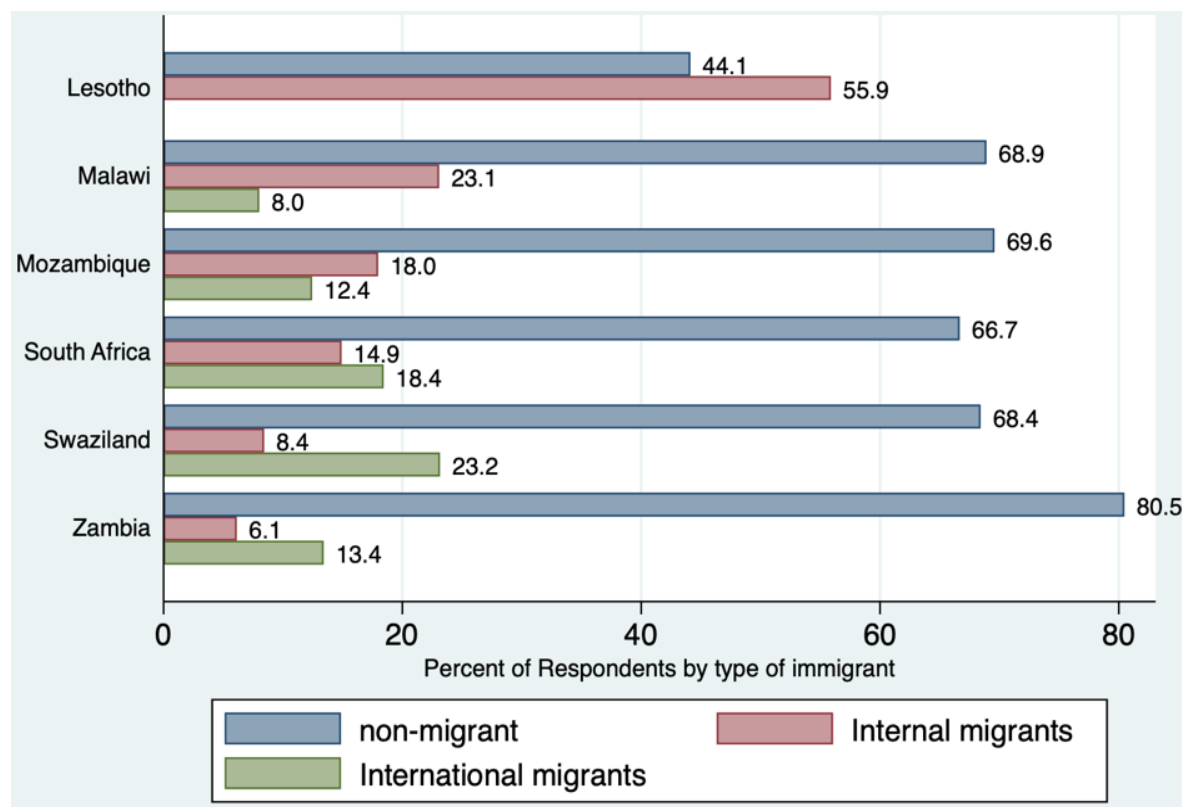
ANNEX D : Sources of contraceptive information

Contraceptive method	Percentage (%)
Female sterilization	12
Male sterilization	9
IUD	10
Injectables	78
Implant	42
Pill	45
Male condom	88
Female condom	34
Diaphragm	6
Jelly Foam	11
Standard days method	28
Lactational amenorrhea method	14
withdrawal	36
Emergency	21

ANNEX E : Sources of contraceptive information

Source of contraception information	Percentage (%)
Govt. Hospital	71
Govt. Health Centre.	49
Family planning clinic	29
Mobile clinic fieldworker	24
Private hospital/clinic	18
Pharmacy	11
Chemist/PMS store	5
Private doctor/nurse	9
Mobile clinic	16
Fieldworker	9
Church	4
School	30
Radio	23
Television	17
Newspaper/magazine	8
Poster/Leaflets	5
Town crier/Mobile Public announcement	2
Other Sources	8

ANNEX F: Contraception use by migration status



ANNEX G: Ethics approval letter



R14/49 Dr D Mapiye

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL) CLEARANCE CERTIFICATE NO. M200553

NAME: Dr D Mapiye
(Principal Investigator)

DEPARTMENT: School of Public Health
Medical School
University

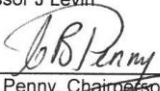
PROJECT TITLE: Factors associated with contraception non-use amongst women aged 15-24 years in migrant communities in Southern Africa in 2018

DATE CONSIDERED: 2020/05/29

DECISION: Approved unconditionally

CONDITIONS:

SUPERVISOR: Professor J Levin

APPROVED BY: 
Dr CB Penny, Chairperson, HREC (Medical)

DATE OF APPROVAL: 2020/07/21

This clearance certificate is valid for 5 years from the date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary on the 3rd Floor, Phillip Tobias Building, Parktown, University of the Witwatersrand, Johannesburg.
I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to submit details to the Committee. **I agree to submit a yearly progress report.** When a funder requires annual re-certification, the application date will be one year after the date when the study was initially reviewed. In this case, the study was initially reviewed in **May** and will therefore reports and re-certification will be due early in the month of **May** each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature

Date

ANNEX H : Plagiarism declaration



PLAGIARISM DECLARATION TO BE SIGNED BY ALL HIGHER DEGREE STUDENTS

SENATE PLAGIARISM POLICY: APPENDIX ONE

I Darlington Shingirirai Mapiye (Student number: 473320) am a student registered for the degree of MSc Epidemiology and Biostatistics in the academic year 2021.

I hereby declare the following:

- I am aware that plagiarism (the use of someone else's work without their permission and/or without acknowledging the original source) is wrong.
- I confirm that the work submitted for assessment for the above degree is my own unaided work except where I have explicitly indicated otherwise.
- I have followed the required conventions in referencing the thoughts and ideas of others.
- I understand that the University of the Witwatersrand may take disciplinary action against me if there is a belief that this is not my own unaided work or that I have failed to acknowledge the source of the ideas or words in my writing.
- I have included as an appendix a report from "Turnitin" (or other approved plagiarism detection) software indicating the level of plagiarism in my research document.

Signature: *dmapiye* Date: 27 September 2021

ANNEX I: Turnitin report

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I, Professor Jonathan Bernhard Levin, the primary supervisor for Darlington Mapiye confirm that I am satisfied with the Turnitin report for his MSc report

Signed 22/09/2021



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