



Individual, household, and community-level predictors of modern contraceptive use among black women in South Africa

TC Motloug

 orcid.org/0000-0002-3236-3178

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Supervisor: Dr M Tsawe

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Student number: 27281760

ABSTRACT

Background: The main objective of the study is to determine the multilevel determinants of modern contraceptive use among sexually active black women in South Africa. Modern contraceptive use is a global social problem and affects women. Therefore, in this study, modern contraceptive includes women's educational status, employment status, marital status, provinces, and parity.

Methods: This study utilises secondary data from the 2016 South Africa Demographic and Health Survey to examine the multilevel determinants of modern contraceptive use among sexually active black women in South Africa. The following analyses were conducted, the univariate analyses, which includes frequencies, as well as the bivariate analysis. The bivariate analysis included a chi-square test to test the association between the selected independent variables and the dependent variable. A multivariate logistic regression analysis was conducted to measure the relationship between the selected factors and the outcome variable.

Results: The findings of the study confirmed that age, marital status, level of education, parity and province were statistically associated with modern contraceptive use. In terms of parity, the findings indicated that the prevalence of modern contraception increased with parity. Women with no parity had (48.0%) prevalence of modern contraception, those in one-to-two parity had (60.6%) and those with three plus had (65.4%) prevalence of modern contraception. In terms of exposure to family planning messages, women that had no exposure to family planning messages had (60.3%) prevalence to modern contraception than women who had exposure to family planning messages with (58.3%). With regards to household wealth, women from well-to-do households had high prevalence of contraceptive use(61.5%), followed by those in the average household wealth (58.7%) and those in the poor household wealth had the least (59.5%) prevalence of modern contraception. The findings also showed that women from urban areas had higher prevalence (60.2%) of modern contraception than those in rural areas (59.5%). The findings further illustrated that sexually active black women less than age twenty 1.84 [95% CI: 1.27-2.65], and those in their twenties 1.32 [95% C.I: 1.09-1.59] had higher odds of using modern contraception compared to those in their thirties (aged 30-39). Women aged 40-49 had lower odds [AOR 0.51, 95% C.I: 0.42-0.63] of using modern contraception compared to those aged 30-39. In terms of level of education, women with secondary education or more had higher odds [AOR 1.57, 95% C.I: 1.23-2.0] of using modern contraception compared to those with primary education. Moreover, the findings showed that the use of modern contraception increased with parity. Women with zero parity had the lower odds [AOR 0.19, 95% CI: 0.15-

0.26] of using modern contraception compared to those with parity three or more. Women with parity one-to-two had lower odds [AOR 0.53, 95% C.I: 0.44-0.64] of using modern contraception compared to those with parity three and more.

Conclusion: Several strategies could play a role in increasing modern contraceptive use among black women in South Africa. These strategies could include (a) enhancing women's skills and encouraging them to finish their basic education, (b) empowering women through the creation of jobs opportunities, especially those from poor backgrounds as a way to increase modern contraceptive use.

Keywords: predictors; modern contraception; black women; multilevel analysis; South Africa

DECLARATION

I, Tsholofelo Caroline Motloun (27281760), declare that this work titled “Individual, household, and community-level predictors of modern contraceptive use among black women in South Africa” is my original research work, and has never been submitted for any degree or examination in any other university or institution. I declare that the information contained in this document is a true copy of my thesis and has been approved for submission by my thesis supervisor. This work was supervised by Dr Mluleki Tsawe, and co-supervised by Dr Osuafor, from the Department of Population Studies and Demography. This work is submitted in partial fulfilment of the requirements for the degree Master of Social Science in Population Studies and Sustainable Development at the North-West University, Mafikeng Campus, South Africa.

Name (student): Tsholofelo Caroline Motloun

Signature: T. C. Motloun

Date: July 2023

Name (supervisor): Dr Mluleki Tsawe

Signature: M. Tsawe

Date: July 2023

Name (co-supervisor): Dr Godswill Osuafor

Signature: G. Osuafor

Date: July 2023

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ABBREVIATIONS/ACRONYMS

BaSSREC	-	Basic and Social Sciences Research Ethics Committee
DUs	-	Dwelling Units
NDoH	-	National Department of Health
PSUs	-	Primary Sampling Unit
SADHS	-	South Africa Demographic Health Surveys
STATA	-	Statistics and Data
UNDP	-	United Nations Development Plan
WHO	-	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Contraceptive use remains a topical issue around the world. The use of contraception has various benefits, especially in developing countries. There are health benefits which include the prevention of unintended pregnancies as it also allows for spacing of pregnancies, especially for young women more so in developing countries (Namasivayam et al., 2020). According to Peer et al. (2013) contraception can simply be defined as the avoidance of pregnancy through short-term or long-lasting means. Despite the successful implementation of contraceptive use in Nigeria, the utilization of any method that prevents or delay pregnancy is still very low, with an estimation of high fertility of about 5.5 children per woman (Ajayi et al., 2016). Additionally, with concerns to use of contraceptive in Sub Saharan region ,Malawi was the only country with the achievement story by being able to increase their contraceptive use in the earlier decades, from 11.6% in the 1990 to its present levels of 46.1% (Alkema et al., 2013). Notwithstanding all that, the total fertility rate is still high in Malawi with 5.7% birth per woman (Adebowale et al., 2014).

South Africa has also witnessed an escalation in the proportion of contraceptive use when compared to the previous decades by an estimated 58.3% in 2017 to 64.6% in 2018 (Kriel et al., 2019). Despite a range of contraceptives that exist for the majority of women in South Africa, countless women still face various challenges when using contraceptives (Blessing Ngcobo et al., 2019) A number of studies have established that some socio-demographic and behavioural attributes impact contraceptive use among South African women (MacInnis & Hodson, 2017). For example, the low contraceptive use has been related to socio-demographic aspects such as women originating from rural areas around South Africa, mainly those with little or no educational attainment, low socio-economic status, inadequate knowledge, accessibility, and even basic awareness of contraceptives.

1.2 Statement of the problem

Family planning is provided freely in most public health institutions in South Africa; however, most women still elect not to utilise these services. The contraceptive use rates remain low and

this is unexpected for a country that provides free family planning services (Baird et al., 2017). A study conducted by McTigue et al. (2022) found that the prevalence of any contraceptive use varied by race, ranging from 47.2% among black Africans, 52.4% among coloureds, 61.1% among Indians to 61.9% among whites. Black African women thus remain the underserved population when it comes to contraception; there is a challenge of quality contraceptive services, equitable access especially in rural areas and women's capability to properly and steadily use contraceptive methods of their choice (McTigue et al., 2022).

Additionally, many women in South Africa find themselves facing the challenge of inadequate alertness of contraceptive means accessible to them and challenges with access to health care and services particularly black women (Blessing Ngcobo et al., 2019). Lower contraceptive use among black women has consequently led to unplanned pregnancies, abortions and maternal mortality remaining relatively high (MacInnis & Hodson, 2017). In addition, risky sexual behaviour puts sexually active women who engage in unprotected sex at higher threat of contracting HIV/AIDS infection and other sexually transmitted diseases (Milton, 2015). A study undertaken by (Milton, 2015) established that the risk of HIV/AIDS difference by race and contraceptive means, and perception of higher threat were higher among black women when compared to other racial groups in South Africa. There is a dearth of studies that had looked at contraceptive use from a multilevel point of view in S.A. This problem does not only affect individuals but the society. This problem does not only affect individuals but the society. Community behaviours and myths play a role in influencing reproductive health outcome in different developing countries (Al Riyami et al., 2004).

1.3 Main objective of the study

The main objective of the study is to determine the multilevel determinants of modern contraceptive use among sexually active black women in South Africa.

1.3.1. Specific objectives of the study

The study aims to answer the following specific objectives:

- To examine the prevalence of modern contraceptive use among sexually active black women in South Africa across individual, household and community factors.
- To investigate the individual, household, and community-level predictors of modern contraceptive use among sexually active black women.

1.4 Research questions

The study aims to answer the following research questions:

- What is the prevalence of modern contraceptive use among sexually active black women in South Africa across individual, household and community factors?
- What are the individual, household, and community level predictors of modern contraceptive use among sexually active black women?

1.5 Significance of the study and rationale

The study focused on sexually active women irrespective of their marital status. This enabled the investigation to target groups that are considered to be ignored such as the woman that are from poor resources' backgrounds, the female youth and those unmarried women who face even more challenges than women that are married in accessing contraception (Chandra-Mouli et al., 2014). Given the nature and importance of contraceptive use, this makes it a significant topic for research. The research will contribute to understanding where South Africa stands with regards to Sustainable Development Goals (SDGs), especially when it comes to improving the health status the citizens of South Africa. The motive for this study is to raise awareness and increase the existing knowledge of literature on issues associated with contraceptive use among black women in South Africa. This study is driven by the need to highlight the fact that many of South African women particularly black women have not yet fully attained satisfactory control over their reproduction (Baird et al., 2017). Understanding factors related to contraceptive use among black women in South Africa is very significant as it will not only benefit the individual, but the society at large (Bradshaw et al., 2019). Moreover, understanding the factors associated with contraceptive use among black women can increase the existing literature. However, this study

aims to contribute to the existing literature on the extent of usage of contraceptives and it will achieve this by utilising multilevel multivariate analysis and the findings will aim to inform family planning program facilitators about the possible ways to improve the status quo and provide a basis for future research.

1.6 Definition of concepts

Modern contraception – This includes ways such as the pill, intrauterine device(IUD),injection, condom, sterilization, diaphragm, implants and female condom (Namasivayam et al., 2020).

Sexually active – In this study, sexually active women are defined as those who reported to have had sexual intercourse in the four weeks preceding the survey (National Department of Health (NDoH) et al., 2016).

1.7 Organisation of the study

The study is divided into five chapters.

CHAPTER 1: INTRODUCTION

The chapter outlines the research problem, definition of research question, motivation of the study, research approach of dissertation, limitations and key assumptions and contribution to be made by research. It also provides background/ context to research.

CHAPTER 2: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

The chapter gives the perspective and sets parameters within which the research problem and research questions are investigated. All the relevant literature to the topic is reviewed and all the variables used are linked to the dependent variable. More importantly, an overview of all concepts and theories applied in the study is given in this chapter.

CHAPTER 3: RESEARCH METHODOLOGY

This chapter outlines the research methodology to be utilized in detail and justification thereof.

CHAPTER 4: RESEARCH RESULTS AND ANALYSIS

The chapter details the research findings. Conclusions are then drawn from amassed data and implications of the findings related to theory at hand.

CHAPTER 4: DISCUSSIONS OF THE RESULTS

The chapter outlines the research findings but more importantly discusses the findings and all other factors thrown up by the study as it progressed to align it all the recommendations and conclusions to be reached.

CHAPTER 5: RECOMMENDATIONS AND CONCLUSION

This chapter provides a summary of the dissertation, a discussion, conclusion, and recommendations reached from the investigation. It further emphasizes the results obtained, the contribution made by the results and makes suggestions for further research in this area.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents the literature on the determinants of modern contraception. Additionally, the subsection presents the theoretical and conceptual frameworks adopted as parameters of this in this study.

2.2 Determinants of contraceptive use

Age

According to Baird et al. (2017), in South Africa estimates of the percentage of women aged between 15-49 years using modern contraceptive approaches have increased gradually from 26.3% in 2002/2003 to 37.3% in 2013/2014. However, contraceptive use is found to be lower between young women aged 15-25, whether married or unmarried- compared to that among the older women aged 26-49 in developing countries (Avisah et al., 2018). Some of the reasons why younger women are not likely to practise contraception compared to older women includes fear of judgement, side effects, lack of knowledge about contraceptives, stereotypes towards contraceptives and health concerns (Blessing Ngcobo et al., 2019). The use of contraceptives amongst young married women is noticeably lower when compared to that by older women in Indonesia. According to the 2019 Indonesia Population, Family Planning, and Family Development Program Performance and Accountability Survey, Indonesia has experienced a decrease in contraceptive use in five decades' period (Teshome et al., 2022). The contraceptive prevalence among married women aged 15-49 has gradually decreasing from 59, 5 percent in 2016 to 55,0 percent in 2019, the pattern was similar among young women aged 15-24 (Gelaye, 2020). It has been established that contraceptive use among older women is higher than among married adolescents. Young women in Indonesia face some barriers in using modern contraceptives (Rahayu et al., 2009).

Marital status

The marital status of women has an influence on sexual and reproductive matters. According to Gammill et al. (2018) marriage is linked with the non-use of contraceptives. This outcome is

associated to factors such as desire to have children within marriage, cultural norms, and gender inequality within the marriage. The contraceptive prevalence rate in Nigeria was 9.8% among married women in the year 2013, and it still continues being lower than the African average, regardless of the higher frequency of family planning knowledge (85%) (Ochako et al., 2016). Furthermore the contraceptive prevalence use among women that are married in Indonesia is still very low (Gafar et al., 2020). Based on the data from Indonesia health ministry, 59.3% women that were married aged 15-49 years used modern contraception methods, 0.4% used traditional methods, 24.7% have used family planning once and 15.5 have never used family planning in their lives (Gafar et al., 2020).

Level of education

Education is one of the key factors that can assist to increase one's knowledge on existing contraceptive procedures, enabling individuals to make informed choices and use contraception more effectively. According to Munakampe et al. (2018) knowledge of reproduction functions is poor particularly amongst the young people who are less educated and there is significant confusion and misperception regarding contraception. Furthermore, the use of modern methods of contraception rises with rising education, from 44% among sexually active women with no education to 62% among women with more than a secondary education (Harris, 2016). Empowering women through increasing opportunities such as women's education and economic opportunities can have an important impact on their overall use of modern contraceptives and limit their total fertility more particular among black women (McTigue et al., 2022). The percentage of women that do not hold any educational qualification decreased from 62.2% in 1990 to 45.0% in the year 2013 in Nigeria, however the positive association between the education of a women and use of contraceptives was reported (Akinyemi et al., 2015). Many authors have concurred that education has a very solid influence on the use of contraception among women in Nigeria (Akinyemi et al., 2015). Women that had higher educational attainment were more likely to request and insist that their partners, for example, use condoms than their counterparts (Oyedokun, 2007).

Employment status

Among the many socio-demographic predictors of contraceptive use, women's work level is one of the most important ones. Women's employment position has been found to have a major

influence on contraceptive use, as their economic standing offers them more autonomy and control over key decisions (MacInnis & Hodson, 2017). Research that was carried out in Turkey has revealed that employed women in the modern sector are more probable to use contraception (Pekkurnaz, 2020). Women who work in agricultural activities have a near-null link with having children at home, according to research, whereas women who work in transitional sectors, such as contemporary sectors, have a negative relationship with the number of children at home (Bongarts Lebbe et al., 2021). High levels of employed women in the society may also correspond with the shift in norms and fertility regulations and can be exposed to new role models, norms, ideas and has seen to also influence them to have lesser children and using contraception in the aims of not having children at all (McTigue et al., 2022). The majority of women in South Africa that are employed tend to use contraceptives and the reason for that is because they regard children as marginal costs rather than a marginal benefit (Peer et al., 2013).

Parity

The number of children a woman has (i.e., parity) and the intention to become pregnant may be reasons why women of reproductive age do not use contraception. As well, the findings of the study by (de Vargas Nunes Coll et al., 2019) show a strong association between parity—the number of children ever born by women—and modern contraceptive use. Here, the utilisation of modern contraception increases substantially with the advancing age of the woman. Similarly, higher parity has been widely observed in the literature to be a positive predictor for modern contraceptive use. Quite expectedly, higher parity women may be mainly associated with modern contraceptive use because they may want to stall childbearing (Samandari et al., 2010). The study conducted by (Nyarko, 2020) was different from several previous studies; specifically, contraceptive use was lower in women with higher parity (≥ 3). One study showed that parity is one of the most salient predictors in the use of contraceptives (Slaymaker et al., 2020). Parity could not stand alone to make a woman of childbearing age willing or not to use contraception. The results of the previous studies showed that the high and low parity of women of childbearing age, coupled with the existence of social support, would further increase the behaviour of using contraceptives in women of childbearing age. This social support has made women of childbearing age able to make the right decisions. Another study stated that a person's parity will increase a woman of childbearing age to use contraception. Thus, parity may be related to contraceptive use but indirectly (de Vargas Nunes Coll et al., 2019).

Exposure to family planning messages

Exposure to FPM increased contraceptive use by 7.1 percentage points (95% CI 6.7, 7.4) among women of reproductive age in SSA (Habibov & Zainiddinov, 2017) . The impact of FPM on contraceptive use was highest in Central Africa [6.7 pp; 95% CI: (5.7–7.7) and lowest in Southern Africa (2.2 pp; 95% CI: (1.3–3.0)]. Cameroon recorded the highest impact of FPM on contraceptive use (6.7 pp; 95% CI: (4.4–9.0)] but exposure to FPM did not have a statistically significant effect on contraceptive use in Rwanda, Namibia, and Liberia (Kaggwa et al., 2008). Findings envisage that the average conceptive use among women of reproductive age who are exposed to FPM significantly increased as compared with those who are not exposed. This finding corroborates the findings that exposure to FPM enhances the use of CU among reproductive-age women (Adedini et al., 2018).

Province/Region

In recent decades, contraceptive use has risen markedly worldwide, although at a much slower pace in sub-Saharan Africa than elsewhere (Ngome & Odimegwu, 2014). About a quarter of women in sub-Saharan Africa currently use modern contraceptive methods, with levels highest in southern Africa. In South Africa (SA), for example, estimates of the proportion of women of reproductive age who are protected against unplanned pregnancies, using modern contraceptive methods, have increased steadily from 26.3% in 2002/2003 to 37.3% in 2013/2014. In Pakistan, approximately 35% (more than 8 million) of married women of reproductive age (MWRA) practice some form of family planning, and of them, around 26% (6 million women) use a modern method (Sano et al., 2018). Within Asia, the highest levels of contraceptive use are found mainly in the Eastern and South-Eastern regions, though other Asian regions also include some countries with high prevalence (Habyarimana & Ramroop, 2018). In 10 countries, contraceptive prevalence in 2015 was 70 per cent or more, with an estimated high of 83 per cent in China. In all, 37 of the 48 countries or areas in Asia with sufficient data to enable estimates had contraceptive prevalence levels of 50 per cent or more in 2015. The lowest level of contraceptive prevalence in Asia was in Afghanistan and Timor-Leste at 29 per cent (Muanda et al., 2017).

Wealth index

Wealth index is an sign of inequalities in household features relative to the utilization of social and health services, and functions of health outcomes (Dias & de Oliveira, 2015). The state of

wealth of women is another significant determinant of contraceptive use (Channa et al., 2019). Urban women that earn better incomes have access to sophisticated healthcare services and are more probable to use modern contraceptives (Kneip Pelster et al., 2022). Many studies have demonstrated that wealth is positively associated with contraceptive usage (Adebowale et al., 2014; Akinyemi et al., 2015; Wandera et al., 2018). Women from wealthier households were likely to use pills, injections and condoms than women from poorer households (MacInnis & Hodson, 2017). Studies based on health care outcome postulated that family planning distributions differed by wealth, for instance the modern contraceptives of the richer were double times that those that were poorer. The differences in access of family planning, information, and direct contact are associated with health gradient (Milton, 2015). Even if family planning is for free there may also be challenges that occur, such as stock out of contraceptives and methods of choice may not be available which turns to benefit women those that are wealthier because of their financial strength as they can thus choose an alternative of accessing same from a private health facilitator (Clifton et al., 2008; Urban et al., 2012).

Place of residence

Inequalities in contraceptive prevalence rate between urban and rural areas mostly affect the poor and rural women whom the majority thereof are black women. Contraceptive use and prevalence speed in South Africa differ according to type of place of residence. As alluded to earlier, inequalities in contraceptive prevalence rate between urban and rural areas mostly affect the poor and rural women whom the majority thereof are black women (Aviisah et al., 2018). According to Peer et al. (2013) the South African society more especially in rural parts, is still male-dominated, whereby men still have major decision making roles when it comes to women using contraception (Ajayi et al., 2016). Black women particularly those who reside in rural areas have very little or no say in their reproductive decision making. This gender inequality in most of the rural areas of the country has further increased the lower rate of contraceptive usage among black women in South Africa (Aviisah et al., 2018). Over 70% of Nigerian women reside in rural parts thereof and yet resources are concentrated in urban areas (health facilities, allocation of funds etc.) and similar status quo exists in South Africa (Aviisah et al., 2018; Beson et al., 2018).

2.3 Theoretical framework

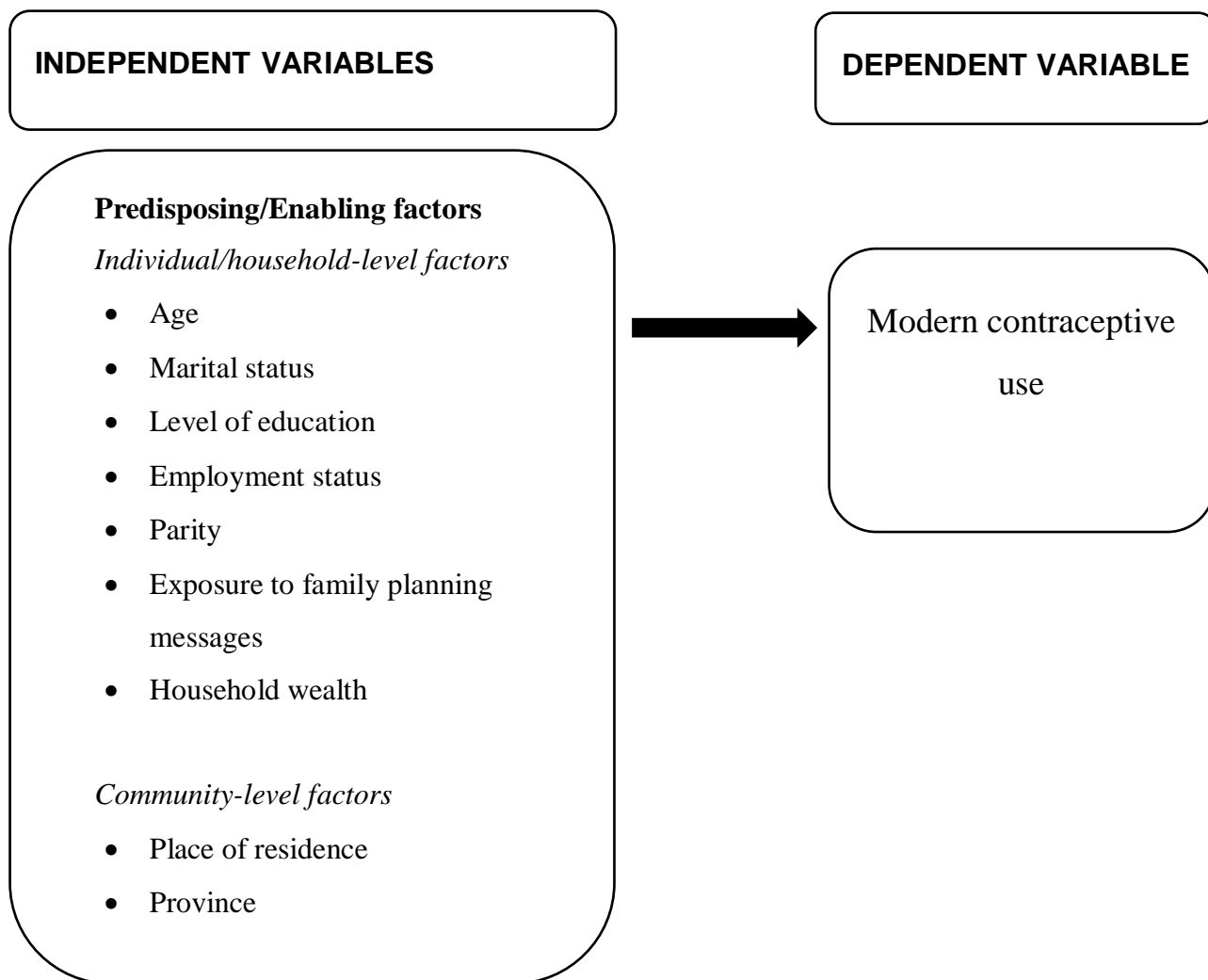
Social-Ecological Model

This study is conducted through the lens of the Social-Ecological Model. The Social Ecological Model was developed by Urie Bronfenbrenner in the 1970s (Aparicio et al., 2016). This model considers the numerous interactions that occur at the individual, relationship/family, community, and societal levels. It enables one to comprehend that human behaviour is influenced by several interacting layers of environmental, social, and community influences (Steege et al., 2018). The individual, whose behaviour is impacted by personal knowledge, beliefs, and attitudes, is at the centre of the model (Epstein et al., 2015). The individual level is situated within the intrapersonal dimensions, attitudes and beliefs that support the use of contraception and it focuses on variables such as age, marital status, level of education, employment status and parity (Aparicio et al., 2016). The relationship/family is situated within interpersonal factors. The patient's interaction with the healthcare professionals has an impact on contraception use and association with sexually aggressive peers. Families are also more likely to spread negative information about contraception, and it focuses on variables such as exposure to family planning messages, household wealth (Aparicio et al., 2016). The community level is the interactions between community organizations and other informal networks that influence contraceptive use and it focuses on variables such as place of residence and province (Schlüter et al., 2014). The societal level influences inequalities based on gender, race and sexual orientation and it focuses on variables such as race, age (Schlüter et al., 2014). Due to the nature of the available dataset, this study will only focus on two levels: the individual/household and community level factors.

2.4 Conceptual framework

The Social-Ecological model was adopted for the study because the model considers various levels that can influence contraceptive behaviour. This model also fits this study because of the hierarchical nature of the data that are utilised in the study. Some of the independent variables selected for this research are related to those mentioned in the above theoretical framework. At the individual/household level the variables considered are age, marital status, employment status, level of education, parity, exposure of family planning messages, household wealth and at the community level the variables considered are community place of residence, province.

Figure 2.1: Conceptual framework depicting the multilevel determinants of modern contraceptive use



CHAPTER THREE

METHODOLOGY

3.1 Study Setting

The study was conducted in South Africa. In the year 2016 about 58.3% of women in South Africa used modern contraception (National Department of Health (NDoH) et al., 2016). The rates of fertility in the year 2019 was at about 2.38 births per 1000 live births (Aviisah et al., 2018).

3.2 Research design

This study adopted a quantitative descriptive research design. A descriptive research design is a type of research design that aims to obtain evidence to systematically describe a phenomenon, situation or population (Alkema et al., 2013) This study specifically used the cross-sectional type of descriptive research design. A cross-sectional research design is defined as a type of observational study design that delivers data for describing the status of phenomena or relations among phenomena at a stable point in time (Akhtar, 2016).

3.3 Data source

This study used secondary data obtained from the 2016 South African Demographic and Health Survey (SADHS). The SADHS is a cross-sectional survey. The survey applied a two-stage stratified sampling; in the first stage probability proportional to size was used to sample the primary sampling unit (PSU); in the second stage, systematic sampling was used to sample the dwelling units (DUs) (National Department of Health (NDoH) et al., 2016). About 9878 women aged 15-49 were selected for the SADHS, but only 8 514 women were interviewed, yielding an 86.2% response rate (National Department of Health (NDoH) et al., 2016).

3.4 Study sample

The study was based on sexually active black women aged 15-49 years in South Africa. The study included 3766 sexually active black women.

3.4.1 Study inclusion and exclusion criteria

The study included 3766 sexually active black women (aged 15 years) and did not include those who do not form part of these criteria.

3.5 Description of study variables

Dependent variable

The dependent variable that is used in this study is modern contraception. Each woman was asked about the type of contraceptive method that they were using. The variable in the dataset is variable v313, with categories 0=no method,1=folkloric method,2=traditional method and 3=modern method. Therefore, the dependent variable in this study was based on those who selected category three and were coded as 1 if they used a modern method and 0 otherwise.

Independent variables

The independent variables selected for this study were age, marital status, level of education, employment status, parity, exposure to family planning messages, household wealth, place of residence, and province.

Table 3.1: Description of independent variables

Independent variables	Description	Coding
<i>individual/household –level factors</i>		
Age group	Age of respondent	1=18-19 2=20-24

Independent variables	Description	Coding
		3=25-29 4=30-35
Marital status	Marital status of a respondent	1=Never in Union 2=Currently in Union 3=Formally in union
Level of education	Highest level of education attained by the respondent	0=No education 1=Primary 2=Secondary 3=Higher
Employment status	Current employment status of the respondent	0=Unemployed 1=Employed
Parity	Respondent's level of parity	1=None 2=1-2 3=3+
Exposure to Family Planning messages	Respondent's exposure to family planning messages	1=No 2=Yes
Household wealth	Household socioeconomic status based mainly on household ownership of assets	1=Poor 2=Average 3=Rich
<u>Community-level factors</u>		
Place of residence	Respondent's place of residence	1=Urban 2=Rural
Province	Respondent's place of residence	1=Western Cape 2=Eastern Cape 3=Northern Cape 4=Free State

Independent variables	Description	Coding
		5=KwaZulu-Natal 6=North West 7=Gauteng 8=Mpumalanga 9=Limpopo

3.6 Method of analysis

The study used stata version 14 for analysis. Three types of analysis were conducted. Firstly, univariate analysis was conducted to describe the study participants. Secondly, bivariate analysis with a chi-square test was conducted to test the association between the variables. Lastly, multivariate analysis was conducted to measure the multilevel relationship between the the independent variables and modern contraceptive use. As a way of disseminating the findings from this study, the student plans to publish one paper based on this study with the supervisor.

Multivariate multilevel logistic regression

The study used multilevel analysis methods with two-level model in which individuals/housholds are nested within communities. These communities are represented by the primary sampling unit (PSU) in the dataset. The level 1 model looks at the relationships among the individual/household-level variables and modern contraceptive use among sexually active black women, while the level 2 model observes the influence of community-level factors on modern contraception use among sexually active black women. The log of the likelihood of using modern contraception among sexually active black women can be detailed as follows:

$$\text{Log} \left[\frac{\pi_{ij}}{1 - \pi_{ij}} \right] = \beta_0 + \beta_1 X_{ij} + \beta_2 Z_{ij} + \ddot{E}_j + e_{ij}$$

Where, i represents the individual factors and j represents the community factors. π_{ij} represents the likelihood of using modern contraception for the i^{th} woman in the j^{th} community. $1 - \pi_{ij}$ represents the odds of not using modern contraception. X and Z indicate the individual and

community-level factors, respectively. The intercept (β_0) indicates the effect on the likelihood of using modern contraception in the absence of the independent variables. β 's shows the fixed coefficients. π_j shows the effect of community-level factors on using modern contraception for the j^{th} community. e_{ij} represents the random errors occurring at the individual level. Four models were fitted in this study. Model 0 is the null model, which was used to assess the variability among the communities without inserting a study variable. Model 1 was fitted with the individual/household-level factors. Model 2 was fitted with community-level factors. Model 3 was fitted with both individual/household-level or community-level factors. A variance inflation (VIF) is a measure of the amount of multicollinearity in regression analysis. The intraclass correlation coefficient (ICC) is a measure of the relatedness of clustered data. Proportion change in variance (PCV) expresses the change in the area level variance between the empty model and the individual model. Medium odds ratio (MOR) are odds between 1.5 and five. Akaike information criterion (AIC) evaluates how well a model fits data it was generated from. The multicollinearity test was conducted and there was no collinearity between the independent variables. The mean VIF was 1.25, the min VIF was 1.04 and the max VIF was 1.59.

3.7 Limitations

The cross-sectional data used in this study does not allow for causation to be studied (for instance, one cannot argue that limited exposure to family planning messages causes women to use less modern contraceptive methods). Due to the self-reported nature of the data, there may be recall or reporting bias in some of the indicators. However, the strength of the study lies in the analytical procedure adopted (multilevel analysis) which makes the study findings much more robust.

3.8 Ethical considerations

Secondary data was also utilised in this research; however, the researcher procured ethical clearance from the North-West University ethical committee. The researcher also secured clearance from Measure DHS and was given approval to use the dataset. Although the researcher was not part of the data collection, the results of this study may pertain certain ethical issues when results are disseminated. The researcher, therefore, took the highest ethic of care in reporting the findings so as to limit any insensitive reporting in this study. Moreover, the dataset

was saved in a password-protected computer during analysis, and it will be deleted after the findings have been disseminated. Moreover, this study received ethical clearance from the North-West University's Basic and Social Sciences Research Ethics Committee (BaSSREC) [ethics number: NWU-01020-22-A7].

CHAPTER 4

DATA ANALYSIS AND RESULTS

4.1 Introduction

This chapter presents the findings of the study from the data amassed. The chapter is divided into three parts, the first part presents the results of the univariate analyses, and this followed by the results of the bivariate analyses whereas the last part presents the results of the multilevel logistic regression. The univariate analyses show the percentage distribution of both dependent variables. Additionally, the bivariate shows the relationship between modern contraceptive use and selected independent variables.

4.2 Characteristics of the study population

Figure 4.1 presents the percentage distribution of modern contraceptive use among sexually active black women. In terms of ever used modern contraceptive, 60.0% of women reported that they used modern contraception. Among those who used modern contraception, the percentage of use varied by type of modern method used. Those who used the pill were 11.7%, injections (30.7%), male condom (28.4%), injection for 2 months (13.2%), IUD (1.8%), female sterilization (7.0%), implants (6.8%), female condom (0.2%), emergency contraception (0.1%) and other modern method was (0.1%).

Figure 4.1: Percentage distribution of modern contraceptive use among sexually active black women

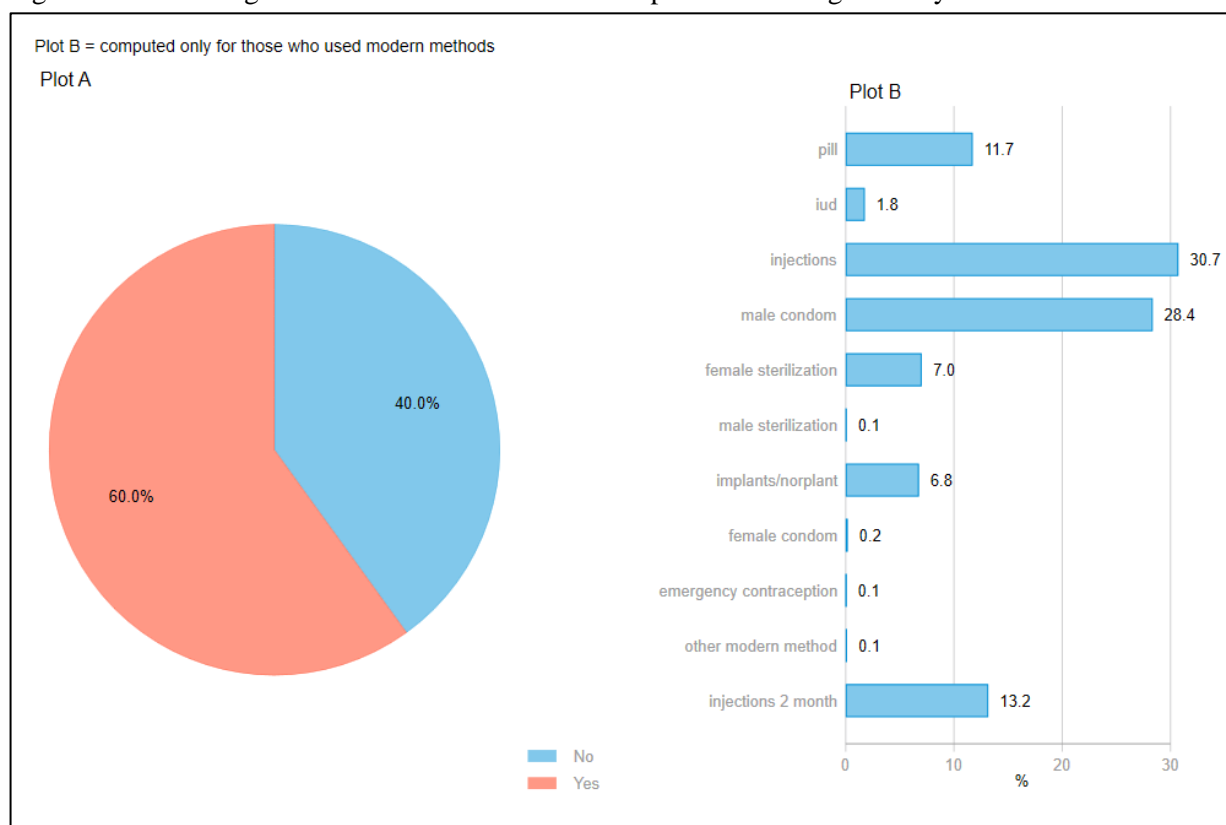


Table 4.1 presents the percentage distribution the study population by background factors. Most of women were those aged 20-29 (37.2%), followed by those aged 30-39 (35.6%) and the least were those age 15-19 (6.5%). About (53.3%) were currently in union and (42.7%) were never married. Regarding woman’s education about (87.9%) had secondary education and more, (10.1%) primary and (2.0%) comprised of no education respectively. In terms of employment, 61.6% were unemployed, and 38.4% were employed. In terms of parity, the majority (54.6%) of women had 1-2 children, followed by those with three and more children (29.3%) and lastly those who had no children (16.1%). The majority (82.9%) of women were not exposed to family planning messages, followed by 17.1% those who were exposed to family planning messages. The majority (43.5%) of women were from poor households, followed by 32.8% from rich households and the lowest percentage was for women from average-wealth households at (23.7%). About 68.1% of women were from urban areas and 31.9% were from rural areas. The majority (36.1%) of women were from Gauteng, KwaZulu-Natal (15.9%), Eastern Cape (9.7%), Limpopo (9.2%), Mpumalanga (8.9%), North West (8.4%), Western Cape (5.9%), Free State (4.9%) and lastly the lowest were from Northern Cape (1.1%).

Table 4.1: Percentage distribution the study population by background factors

Characteristics	N	%
Individual/household-level factors		
<i>Age group</i>		
15-19	246	6.5
20-29	1 401	37.2
30-39	1 342	35.6
40-49	777	20.6
<i>Marital status</i>		
Never in union	1 608	42.7
Currently in union	2 007	53.3
Formerly in union/living with a man	150	4.0
<i>Level of education</i>		
No education	75	2.0
Primary	379	10.1
Secondary+	3 312	87.9
<i>Employment in the last 12 months</i>		
Not employed	2 319	61.6
Employed	1 447	38.4
<i>Parity</i>		
0	607	16.1
1-2	2 055	54.6
3+	1 104	29.3
<i>Exposed to family planning messages</i>		
No	3 123	82.9
Yes	643	17.1
<i>Household wealth</i>		
Poor	1 640	43.5
Average	891	23.7
Rich	1 235	32.8
Community-level factors		
<i>Place of residence</i>		
Urban	2 566	68.1
Rural	1 200	31.9
<i>Province</i>		
Western Cape	222	5.9
Eastern Cape	364	9.7
Northern Cape	40	1.1
Free State	184	4.9
KwaZulu-Natal	600	15.9
North West	317	8.4
Gauteng	1 359	36.1
Mpumalanga	335	8.9
Limpopo	345	9.2
Total	3 766	100.0

4.3 Prevalence of modern contraceptive use among Black women

Table 4.2 shows the prevalence of modern contraceptive use among sexually active black women by background characteristics. The findings showed that age, marital status, level of education,

parity and province were statistically associated with modern contraceptive use ($p < 0.001$). There was a high prevalence (64.1%) of modern contraceptive use among women in their twenties (20-29), as well as those in their thirties (62.5%). Regarding marital status, never in union women had a higher prevalence (65.4%) of modern contraceptive use. Women with secondary education and more had a higher prevalence (61.2%) of modern contraceptive use. In terms of employment, women who were employed had higher prevalence (60.4%) of modern contraceptive use.

Moreover, the findings showed that the prevalence of modern contraceptive use increased with parity. Women with zero parity had a higher prevalence (48.0%) of modern contraceptive use, those with one-to-two parity had a 60.6% prevalence of modern contraceptive use and those with three or more children had a 65.4% prevalence of modern contraceptive use. In terms of exposure to family planning messages, women who had no exposure to family planning messages had 60.3% prevalence of modern contraceptive use, while those who had access to family planning messages had a 58.3% prevalence of modern contraceptive use. In terms of household wealth, women from rich households had higher prevalence (61.5%) of modern contraceptive use, followed by those from average-wealth households (58.7%). The findings further showed that women from urban areas had higher prevalence (60.2%) of modern contraceptive use than those women from rural areas (59.5%). Women from Western Cape had a higher prevalence (70.9%) of modern contraceptive use, followed by women from KwaZulu-Natal (64.9%), Mpumalanga (62.0%), Eastern Cape (60.2%), Gauteng (58.8%), North West (58.7%), and Northern Cape (57.8%); women from Limpopo (52.3%) and Free State had a lower prevalence (52.2%) of modern contraceptive use. Moreover, black sexually active women from Northern Cape, Free State, North West, Gauteng, and Limpopo had an overall prevalence of modern contraceptive use which was lower than the national level of 60%.

Table 4.2: Prevalence of modern contraceptive use among sexually active black women by background characteristics

Characteristics	Contraceptive use				Total	Chi-square	
	No		Yes			Value	P-value
	%	CI	%	CI			
Individual/household-level factors							
<i>Age group</i>					55.2	0.000	
15-19	40.1	[32.9-47.6]	59.9	[52.4-67.1]	100.0		
20-29	35.9	[32.5-39.4]	64.1	[60.6-67.5]	100.0		

Characteristics	Contraceptive use				Total	Chi-square	
	No		Yes			Value	P-value
	%	CI	%	CI			
30-39	37.5	[34.3-40.7]	62.5	[59.3-65.7]	100.0		
40-49	51.9	[47.4-56.4]	48.1	[43.6-52.6]	100.0		
<i>Marital status</i>						27.5	0.000
Never in union	34.6	[31.5-37.8]	65.4	[62.2-68.5]	100.0		
Currently in union	44.2	[41.4-46.9]	55.8	[53.1-58.6]	100.0		
Formerly in union/living with a man	43.2	[33.1-53.9]	56.8	[46.1-66.9]	100.0		
<i>Level of education</i>						19.7	0.000
No education	55.1	[39.7-69.6]	44.9	[30.4-60.3]	100.0		
Primary	48.1	[41.2-55.1]	51.9	[44.9-58.8]	100.0		
Secondary+	38.8	[36.6-41.0]	61.2	[59.0-63.4]	100.0		
<i>Employment in the last 12 months</i>						0.2	0.668
Not employed	40.3	[37.7-43.0]	59.7	[57.0-62.3]	100.0		
Employed	39.6	[36.3-43.0]	60.4	[57.0-63.7]	100.0		
<i>Parity</i>						44.8	0.000
0	52.0	[46.8-57.1]	48.0	[42.9-53.2]	100.0		
1-2	39.4	[36.6-42.3]	60.6	[57.7-63.4]	100.0		
3+	34.6	[31.2-38.2]	65.4	[61.8-68.8]	100.0		
<i>Exposed to family planning messages</i>						2.4	0.121
No	39.7	[37.1-42.3]	60.3	[57.7-62.9]	100.0		
Yes	41.7	[36.9-46.8]	58.3	[53.2-63.1]	100.0		
<i>Household wealth</i>						1.5	0.477
Poor	40.5	[37.4-43.6]	59.5	[56.4-62.6]	100.0		
Average	41.3	[36.9-45.9]	58.7	[54.1-63.1]	100.0		
Rich	38.5	[34.8-42.3]	61.5	[57.7-65.2]	100.0		
Community-level factors							
<i>Place of residence</i>						0.0	0.888
Urban	39.8	[37.0-42.7]	60.2	[57.3-63.0]	100.0		
Rural	40.5	[37.9-43.1]	59.5	[56.9-62.1]	100.0		
<i>Province</i>						33.1	0.000
Western Cape	29.1	[21.2-38.6]	70.9	[61.4-78.8]	100.0		
Eastern Cape	39.8	[35.4-44.5]	60.2	[55.5-64.6]	100.0		
Northern Cape	42.2	[33.0-52.0]	57.8	[48.0-67.0]	100.0		
Free State	47.8	[40.8-54.9]	52.2	[45.1-59.2]	100.0		
KwaZulu-Natal	35.1	[30.9-39.4]	64.9	[60.6-69.1]	100.0		
North West	41.3	[36.5-46.2]	58.7	[53.8-63.5]	100.0		
Gauteng	41.2	[36.7-45.9]	58.8	[54.1-63.3]	100.0		

Characteristics	Contraceptive use				Total	Chi-square	
	No		Yes			Value	P-value
	%	CI	%	CI			
Mpumalanga	38.0	[31.9-44.6]	62.0	[55.4-68.1]	100.0		
Limpopo	47.7	[42.5-52.9]	52.3	[47.1-57.5]	100.0		
Total	40.0	[37.9-42.2]	60.0	[57.8-62.1]	100.0		

Note: CI = confidence interval

4.4 Multilevel determinants of modern contraceptive use among black women

Table 4.3 presents the multilevel logistic regression results for the predictors of modern contraceptive use among sexually active black women in South Africa. The findings showed that sexually active black women aged 15-19 [AOR 1.84; 95% CI: 1.27-2.65] and those in their twenties [AOR 1.32; 95% C.I: 1.09-1.59] had higher odds of using modern contraception compared to those in their thirties (aged 30-39). Women aged 40-49 had lower odds [AOR 0.51; 95% C.I: 0.42-0.63] of using modern contraception compared to those aged 30-39. The findings showed that the used of modern contraception increased with education among sexually active black women. Women with secondary education or more had higher odds [AOR 1.57; 95% C.I: 1.23-2.0] of using modern contraception compared to those with primary education. Moreover, the findings showed that the use of modern contraception increased with parity. Women with zero parity had the lower odds [AOR 0.19; 95% CI: 0.15-0.26] of using modern contraception compared to those with parity three or more. Women with parity one-to-two had lower odds [AOR 0.53; 95% C.I: 0.44-0.64] of using modern contraception compared to those with parity three and more.

Women from Eastern Cape had lower odds [AOR 0.62; 95% C.I: 0.38-1.03] of using modern contraception compared to those from Western Cape. Women from Northern Cape had lower odds [AOR 0.48; 95% C.I: 0.28-0.85] of using modern contraception compared to those from Western Cape. Women from Free State had lower odds [AOR 0.43; 95% C.I: 0.26-0.70] of using modern contraception compared to those from Western Cape. Women from KwaZulu-Natal had lower odds [AOR 0.61; 95% C.I: 0.37-1.00] of using modern contraception compared to those from Western Cape. Women from North West had lower odds [AOR 0.58; 95% C.I: 0.35-0.95] of using modern contraception compared those from Western Cape. Women from Gauteng had lower odds [AOR 0.57; 95% C.I: 0.35-0.91] of using modern contraception compared to those

from Western Cape. Women from Mpumalanga had lower odds [AOR 0.66; 95% C.I: 0.40-1.08] compared to those from Western Cape. Women from Limpopo had lower odds [AOR 0.41, 95% C.I 0.05-0.68] compared to those from Western Cape.

Table 4.3: Multilevel logistic regression results for the predictors of modern contraceptive use among sexually active black women in South Africa

Variable	Model 1		Model 2		Model 3	
	AOR	95% CI	AOR	95% CI	AOR	95% CI
Individual/household-level factors						
<i>Age group</i>						
15-19	1.88***	[1.31-2.71]			1.84***	[1.27-2.65]
20-29	1.32**	[1.09-1.59]			1.32**	[1.09-1.59]
30-39®	1				1	
40-49	0.50***	[0.41-0.61]			0.51*	[0.42-0.63]
<i>Marital status</i>						
Never in union	1.14	[0.79-1.65]			1.09	[0.75-1.57]
Currently in union	0.68*	[0.48-0.97]			0.66	[0.46-0.94]
Formerly in union/living with a man®	1				1	
<i>Level of education</i>						
No education	1.01	[0.60-1.72]			0.98	[0.57-1.66]
Primary®	1				1	
Secondary+	1.54***	[1.21-1.97]			1.57***	[1.23-2.00]
<i>Employment in the last 12 months</i>						
Not employed	0.91	[0.78-1.07]			0.92	[0.78-1.08]
Employed®	1				1	
<i>Parity</i>						
0	0.19***	[0.15-0.26]			0.19***	[0.15-0.26]
1-2	0.53***	[0.44-0.64]			0.53***	[0.44-0.64]
3+®	1				1	
<i>Exposed to family planning messages</i>						
No	1.16	[0.95-1.42]			1.15	[0.94-1.41]
Yes®	1				1	
<i>Household wealth</i>						
Poor	0.96	[0.79-1.15]			0.96	[0.79-1.17]
Average®	1				1	
Rich	0.97	[0.79-1.19]			0.95	[0.77-1.18]
Community-level factors						
<i>Place of residence</i>						
Urban®			1		1	
Rural			1.00	[0.84-1.19]	0.96	[0.78-1.18]
<i>Province</i>						
Western Cape®			1		1	
Eastern Cape			0.65	[0.40-1.03]	0.62	[0.38-1.03]
Northern Cape			0.53*	[0.31-0.90]	0.48*	[0.28-0.85]
Free State			0.43***	[0.27-0.69]	0.43***	[0.26-0.70]
KwaZulu-Natal			0.72	[0.45-1.14]	0.61*	[0.37-1.00]
North West			0.60*	[0.38-0.95]	0.58*	[0.35-0.95]
Gauteng			0.57*	[0.36-0.89]	0.57*	[0.35-0.91]
Mpumalanga			0.74	[0.46-1.17]	0.66	[0.40-1.08]

Variable	Model 1		Model 2		Model 3	
	AOR	95% CI	AOR	95% CI	AOR	95% CI
Limpopo			0.45***	[0.28-0.72]	0.41***	[0.25-0.68]

Note: * = p<0.05; ** = p<0.01; *** = p<0.001; ® = reference category; AOR = adjusted odds ratio; CI = confidence interval

Table 4.4 presents the random effects and model fit statistics for modern contraceptive use among sexually active black women. The empty model (model 0) shows some variations in usage of contraception among sexually active black women (variance = 0.175 [95% CI: 0.09-0.33]). The empty model was attributed to between cluster variations (ICC 5.06%). The between cluster variations increased from 5.06% in model 0 to 5.59% in model 3. The results from the MOR confirmed that the community level factors shaped the odds of contraceptive. The PCV was negative because community level variance increased (rather than decrease) in the second and final models. The final (full) model was the best fitted model because it had the lowest -2LL and AIC.

Table 4.4: Random effects and model fit statistics for modern contraceptive use among sexually active black women

Random effects result	Model 0	Model 1	Model 2	Model 3
PSU variance (95% CI)	0.175 [0.09-0.33]	0.226 [0.13-0.40]	0.142 [0.07-0.30]	0.195 [0.1-0.37]
ICC %	5.06	6.42	4.13	5.59
MOR	1.49	1.57	1.43	1.52
PCV %	®	-29.14	18.86	-11.43
Model fitness				
-2LL	4732.17	4509.57	4703.39	4485.68
AIC	4736.18	4539.57	4725.39	4533.68
PSU	618	618	618	618

Note: ® = reference; ICC = intra-cluster correlation coefficient; MOR = median odds ratio; PCV = proportional change in variance; -2LL = deviance [-2 log-likelihood]; AIC = Akaike Information Criterion; PSU = Primary Sampling Unit

CHAPTER 5

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS OF THE STUDY

5.1 Introduction

This chapter focuses on discussions of the results presented in the previous chapter as well as highlights conclusions and recommendations of the study. The study approaches these discussions based on the predictors that were selected for this study.

5.2 Discussions

The results revealed that there are several predictors of modern contraceptive use among black women in South Africa. The findings showed that age, marital status, level of education, parity and province are some of the significant predictors that influence modern contraceptive use. These findings are like those of other studies which have found some of these factors to be significant factors in explaining contraceptive use (Alkema et al., 2013; Gammill et al., 2018; Oyedokun, 2007). This study found that contraceptive usage differed by age. Young black women used contraceptives more than the older black women (contraceptive usage generally decreased with age). Aviiisah et al. (2018), supports the findings of the study by stating that contraceptive use differed with age. Ahinkorah (2020), revealed that the use of contraceptives was higher among women aged 20-24 compared to older women. A lot of women in the younger ages are sexually active hence majority of them tend to use contraceptives more. The findings further showed that the more the woman is educated the higher odds of contraceptive use. (Asekun-Olarinmoye et al., 2013), supports this finding and states that education exposes women to reproductive health information and it ends up empowering them to make informed decisions about their reproductive health. (Babazadeh et al., 2020) also stated that women with no formal education and primary education were less likely to use modern contraception compared to those with secondary or more education.

The findings of this study showed that women that were never in union used contraceptives more than those that were currently in union, and those that were formally in union. One study found that marriage was associated with non-usage of contraceptives Colleran and Mace (2015). This finding was previously aligned to the desire to have children within marriage, cultural norms or opposition by the husband (Zimmerman et al., 2019). The findings suggests that a lot of

unmarried women do take contraceptives. The author further found that women who were married had lower odds of using modern contraception compared to those who were cohabiting Zimmerman et al. (2019).

In relation to different provinces, the multivariate findings showed that women from Northern Cape, Free State, KwaZulu-Natal, North West, Gauteng, and Limpopo had lower odds of using modern contraception. Similar studies have also revealed that there are often provincial (and regional) differences in the use of modern contraception in different developing countries ((Alkema et al., 2013; Gafar et al., 2020; Mjwara & Maharaj, 2018; Molnar et al., 2016). These findings are consistent with findings by (Channa et al., 2019), which revealed that contraceptive use was high in Western Cape compared to other provinces in South Africa. Moreover, the findings of this study speak to the Social-Ecological Model in the sense that certain factors such as age, marital status, level of education, employment, parity, exposed to family planning messages, household wealth and place of residence were found to be important determinants of modern contraceptive use among black sexually active women in South Africa.

5.3 Conclusion

In conclusion, South Africa is one of the countries with the highest level of HIV and AIDS, particularly among Black people. The study showed that several predictors are associated with modern contraceptive use among women in South Africa. Specifically, the study further illustrated that predictors such as age, marital status, level of education, parity and province were statistically associated with modern contraceptive use among black women in South Africa. Moreover, the multilevel logistic regression analysis showed that current age of women, province, highest level of education, parity, current marital status were significant predictors of modern contraceptive use among Black women in South Africa.

5.4 Recommendations

Subsequently, the researcher can thus safely link recommendations made herewith to lower use of modern contraception among older sexually active black women, lower use of modern contraception among sexually active black women with lower levels of education, lower use of modern contraception among sexually active black women from Northern Cape, Free State,

KwaZulu-Natal, North West, Gauteng and Limpopo. There is a dire need to increase modern contraceptive use among black women in South Africa to be closer to hundred percent. In increasing modern contraceptive use, there are several strategies targeting women with lack of modern contraceptive, with regards to uneducated women experiencing low contraceptive use, there should be programs aimed at enhancing women's skills and encouraging them to finish their basic education. Furthermore, the findings suggest that women should be empowered through the creation of jobs opportunities, especially those from poor backgrounds, to increase modern contraceptive use.

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APPENDICES

Figure A1: Ethics approval letter



NWU
NORTH-WEST UNIVERSITY
NORDEKHOE-UNIVERSITEIT
YUNIBESITHI G BOKONE BOPIHAMA

Private Bag X1290, Potchefstroom
South Africa 2520
Tel: 018 299-1111/2222
Fax: 018 299-4910
Web: <http://www.nwu.ac.za>
Senate Committee for Research Ethics
Tel: 016 103 4446
Email: Feziwe.Mseleni@nwu.ac.za

04 November 2022

ETHICS APPROVAL LETTER OF STUDY

Based on approval by the **Basic and Social Sciences Research Ethics Committee (BaSSREC)** on **24/08/2022**, the Basic and Social Sciences Research Ethics Committee hereby **approves** your study as indicated below. This implies that the North-West University Senate Committee for Research Ethics (NWU-SERC) grants its permission that, provided the special conditions specified below are met and pending any other authorisation that may be necessary, the study may be initiated, using the ethics number below.

Study title: Individual, household, and community-level predictors of modern contraceptive use among black women in South Africa

Study Leader/Supervisor (Principal Investigator)/Researcher: Dr Mluleki Tsawe

Student/Research Team: TC Motloung-27281760

Ethics number:

N	W	U	-	0	1	0	2	0	-	2	2	-	A	7
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Institution Study Number Year Status
Status: S = Submission; R = Re-Submission; P = Provisional Authorisation; A = Authorisation

Application Type: Single study

Commencement date: 29/08/2022 **Risk:** No risk

Expiry date: 28/08/2023

Approval of the study is initially provided for a year, after which continuation of the study is dependent on receipt and review of the annual (or as otherwise stipulated) monitoring report and the concomitant issuing of a letter of continuation.

Special in process conditions of the research for approval (if applicable):

General conditions:

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, the following general terms and conditions will apply:

- *The study leader/supervisor (principal investigator)/researcher must report in the prescribed format to the BaSSREC:*
 - *annually (or as otherwise requested) on the monitoring of the study, whereby a letter of continuation will be provided, and upon completion of the study; and*
 - *without any delay in case of any adverse event or incident (or any matter that interrupts sound ethical principles) during the course of the study.*
- *The approval applies strictly to the proposal as stipulated in the application form. Should any amendments to the proposal be deemed necessary during the course of the study, the study leader/researcher must apply for approval of these amendments at the BaSSREC, prior to implementation. Should there be any deviations from the study proposal without the necessary approval of such amendments, the ethics approval is immediately and automatically forfeited.*
- *Annually a number of studies may be randomly selected for an external audit.*
- *The date of approval indicates the first date that the study may be started.*

1

Figure A2: Map of South Africa showing the prevalence of modern contraceptive use among sexually active black women

