FACTORS INFLUENCING MODERN CONTRACEPTIVE USE IN KINSHASA

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LIST OF SYMBOLS, ABBREVIATIONS AND ACRONYMS

W.H.O:	World health organization
MPCR:	Modern method contraceptive prevalence rate
DMPA-SC:	Depot medroxyprogesterone acetate (DMPA) Subcutaneous (SC)
RH:	Reproductive health
FP:	Family planning
DRC:	Democratic Republic of Congo
NET-EN :	Norethisterone enanthate
mcg :	Micrograms
mg:	Milligrams
STIs:	Sexually transmitted infections
IUDs:	Intrauterine devices
km^2 :	Square kilometer
USAID:	United States Agency for International Development
MFC:	Modern female contraceptive
DHS-DRC:	Demographic and Health survey in Democratic Republic of Congo
PMA:	Performance Monitoring for action
MC:	Modern contraceptive

ABSTRACT

Family planning enables individuals and couples to appropriately schedule and regulate the timing and number of births. Women who carry unplanned pregnancies are susceptible to postnatal complications, which directly impact their well-being, making them a burden to society. There were 27,600 adolescent abortions recorded in the Democratic Republic of Congo (DRC), accounting for about 19% of abortion cases in Kinshasa in 2021. The reproduction rate remains one of the highest in the world at 5.7% and there is a low contraception prevalence across all methods (28%) in 2022. This study aims to determine the factors that influence modern contraceptive use among women in Kinshasa city in the DRC by using data from the PMA 2020 cross-sectional survey to assess the association between predictors and modern contraceptive use through logistic regression analysis (OR and 95% CI).

The findings show that older women are more likely to use modern contraceptives than younger women (15-22) and their sensitivity diminishes as they age. This likelihood is also high when women do not discuss this topic with their partners. As household size increases, women's use of modern contraceptives is positively affected. The same is true for women who have given birth at least compared to those who have never given birth. Wanting fewer children makes women more likely to use contraceptives than when they want more children. Male condoms for their partners, emergency contraceptives, and pills are the more common contraception methods resorted to by women aged 15-31, while the most common contraceptive method used by older women is female sterilization.

In a country with rapid population growth such as the DRC, the strategy should focus on raising awareness among young women through school programs, health facilities, community outreach, and other means to achieve optimal use of modern contraceptives based on commonly used methods and involving adult men and women.

Key words: family planning, modern contraceptive, young women, Kinshasa.

1. INTRODUCTION

1.1 BACKGROUND

Family planning allows individuals and couples to schedule and regulate births at the appropriate time and number according to the WHO. It is made possible through the application of natural or artificial contraception. Family planning offers the couple and especially the woman a state of overall well-being, with measurable benefits on her reproductive health. (SHAW, 2010)

The concept of contraception goes back to long before Jesus Christ in the tribe of Israel. After the death of Er, his eldest son, Judah asked Onan to go to his brother's wife in order to have a sex act and become a father to look after the children. Onan, not wanting to father any children, ejaculated on the ground to prevent a pregnancy from occurring. (Genesis 38: 8-10)

The world's population grew from about 1.7 billion to 6 billion between 1900 and 1999. The least developed countries account for most of this population and could reach 90% of the world population by 2050.(Ethiopia, 2010)

The world witnessed a rapid rise in the birth rate around the 1950s, which led to the creation of several birth control organizations until the creation of family planning in 1960.

An estimated 222 million women worldwide are unable to plan a pregnancy despite their intention to do so. The most likely causes are those related to the availability of and access to contraception, limited choice of contraceptive method, ethnic, cultural and religious factors, side effects and previous reproductive health experience.

The rate of maternal death and unsafe abortion remains very high in developing countries, with 21 million abortions and 47,000 maternal deaths each year. The practice of FP could help lower the mortality curve and achieve the Sustainable Development Goals by promoting access to contraception for all to ensure a state of complete well-being and community development as well as women's empowerment.

Successful contraception leads to direct benefits for maternal and child health, including the prevention of unwanted pregnancies and all that goes with it.

Several studies show that in the long term when a pregnancy is unplanned, it exposes the woman to inappropriate obstetrical management than when it is planned. In addition, there are maternal-fetal complications of varying degrees depending on the age during pregnancy (Osmani et al., 2015).

Each year, approximately 23 million girls aged 15–19 in poor countries have an unmet need for modern contraception, as the majority of them become pregnant before reaching age 15. Worldwide, 885 million women of childbearing age express a desire for contraception (International Federation of Gynecology and obstetrics 2018).

Idris Mohamed Idris, in an Eritrean study of factors influencing contraceptive use at the local maternity hospital in Orotta, found a prevalence of 26.4% among a total of 250 female respondents with a median age of 29 years, mostly with secondary or higher education and 9.6% unmarried (Idris, 2020).

In sub-Saharan Africa, contraceptive promotion remains a major challenge. The prevalence of modern contraceptive use has not shown significant variation over time. These variations are 0.77% in Lagos, Nigeria, and 3.64% in Ghana (Ahmed et al., 2019).

According to the main indicators of FP in 2020, in DR Congo, the unmet need for modern contraception is about 40.2%, the number of unwanted pregnancies is 1,918,000, while the Sustainable Development Goals call for wider health care coverage, including reproductive health (Family planning, 2020).

The DRC has a mix of strong family planning achievements and extreme FP challenges and is focusing on introducing new advances such as self-injection for DMPA-SC. Several provinces are still experiencing armed conflict and others are landlocked, resulting in limited or no access to FP products and/or services, owing to supply chain issues. To advance FP, the country is focusing on the government’s acceptance and approval of its Reproductive Health and Family Planning Law, which aims to establish and fund a budget line for FP and increase access to FP services and supplies for all, including youth.

Kinshasa has a large number of private and public FP clinics and a higher MCPR than the rest of the country, but the need for modern contraception remains high. It is therefore very important to study the factors in order to remedy this situation.

Some important dates and facts to remember:

The father of FP is the Parisian Marquis Marie Jean Antoine Nicholas Caritat de Condorcet (1743-1794). Guided by demographic considerations, he was an active advocate for FP several years before Malthus.

The first family planning clinic was opened in 1882 in Amsterdam by Dr. Alette H. Jacobs. In 1978, the Alma Ata Conference allowed the introduction of terms such as “maternal,” “child care,” and “family planning.”

The conference on the Reform of Reproductive Health Education in 1996 was held in Ouagadougou with emphasis on the aspects and components of reproductive health.

Since 1998, the DRC has issued documents pertaining to the policy, master plan of development, organizational framework, and standards in reproductive health. In 2001, the National Program for Desirable Births became the National Reproductive Health Program (Kitenge Kia Kayembe et al, 2011).

Despite the DRC’s ratification of the Maputo Protocol, there were 70,700 pregnancies among adolescents in Kinshasa, resulting in 49% (3,443) of induced abortions compared to 39% of unwanted births in 2016. The rate of unwanted pregnancy among women aged 15-19 were 80%, while the rate was estimated at 53-67% in 2016 among women aged 20-49. There were 27,600 abortions among adolescents in the DRC, representing about 19% of abortion cases in Kinshasa (Fatusi et al., 2021).

The reproductive rate in the DRC remains one of the highest in the world at 5.7, while the contraceptive rate was only an average of 28% (as of 2018), all methods combined, among married women. The adolescent fertility rate is 108 per 1,000 live births, compounded by a high maternal mortality rate of 846 per 100,000 live births (The World Bank group, 2022).

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Considering this background, the research question is What are the factors that influence the use of modern contraceptives in Kinshasa, the capital of the Democratic Republic of Congo in 2020?

1.2 OBJECTIVE

1.2.1 General Objective

The objective of this study is to determine the factors associated with modern contraceptive use among women in Kinshasa, the capital of the Democratic Republic of Congo.

1.2.2 Specific Objectives

The specific objectives of this study are:

i) Describe the sociodemographic factors of women in Kinshasa.
ii) Investigate the factors related to the rate of using modern contraceptive.
iii) Assess the level of knowledge of FP among non-menopausal adult women.

1.3 HYPOTHESES

The research hypotheses are as follows:

i) Increasing age increases the use of modern contraceptives.
ii) Involving the partner or husband in the FP process increases the use of modern contraceptives.
iii) Increasing women's knowledge of modern contraceptive methods increases their use.
iv) Low income levels lead to increased use of modern contraceptives.
v) The existence of a gynecological or obstetrical history increases the use of modern contraceptives.

2. LITERATURE REVIEW

2.1 CONCEPT DEFINITIONS

2.1.1 FAMILY PLANNING

There are many ways to define FP. According to the WHO, FP allows individuals and couples to appropriately schedule and regulate the time and number of births (SHAW, 2010).

2.1.2 CONTRACEPTION

Contraception is defined as an intentional way of preventing pregnancy by the man or woman using natural or artificial, medicinal or surgical methods either traditional or modern (Jain & Muralidhar, 2011).

Contraceptives can be defined as any method or device that prevents pregnancy by preventing fertilization of the egg by the spermatoid or by preventing implantation of the fertilized egg. It is to be distinguished from contraception, which entails controlling births after fertilization, by preventing the development of the fertilized egg.

An unintended pregnancy is one that occurs in a woman who did not plan to have a child at that time, regardless of whether the pregnancy was terminated or not. Conversely, an unintended pregnancy occurs in a woman who does not want to have a child (UNFPA, 2022).

2.1.3 THE PEARL INDEX

The Pearl Index determines the failure rate of a contraceptive method in a year of use per 100 women compared to the total number of menstrual cycles during the entire period of contraceptive use. (Barnhart, 2019).

2.1.4 MODERN CONTRACEPTIVE

Despite several definitions used, a modern contraceptive method can be defined as one where a medical product or procedure is used, that prevents reproduction from sexual acts.

The following methods are considered modern: Sterilization (male and female), IUDs, implants, contraceptives pill, condoms (male and female), injectable, emergency, contraceptive pills, patches, diaphragms and cervical caps, spermicidal agents (gels, foams, creams, suppositories, etc.), vaginal rings (Hubacher & Trussell, 2015).
The lactational amenorrhea method (LAM), abstinence, withdrawal, and fertility awareness approaches are traditional method.

2.2 CHARACTERISTICS OF AN IDEAL CONTRACEPTIVE

A contraceptive device must not interfere with the couple's normal sexual drive or libido in any way. The main characteristics are as follows:

i) Efficiency,
ii) Harmlessness,
iii) Reversibility,
iv) Acceptability and ease of use,
v) Affordable cost.

2.3 CONTRACEPTIVES METHODS (Birth control methods)

Contraceptive methods can be classified into artificial and natural methods, or into hormonal, natural and mechanical methods according to different authors. it is this last classification that we present as follows.

2.3.1 HORMONAL CONTRACEPTIVES

2.3.1.1 Progestin implant

Progestin implants are placed under the skin of the upper arm and have the advantage of being very effective from day one, with a duration of action of up to five years and a Pearl Index of between 0.5 and 1%. However, weight gain, menstrual disorders, and late return of fertility are the main disadvantages of this method. Decreased libido, mood disorders, headaches, and sometimes abdominal pain are some of the side effects.

2.3.1.2 Progestin-only injectable contraceptives

These are progesterone-only contraceptives, which may include DMPA and NET-EN. They are also known as Depo-Provera and Noristerat.

Injected intra-muscularly or even subcutaneously, these contraceptives act by the anti-gonadal action of progesterone on the hypothalamic-pituitary-gonadal axis. They prevent the nidation of a fertilized egg by atrophy of the endometrium and thicken the cervical mucus to prevent the passage of spermatozoa towards the uterine cavity and the fallopian tubes.

It is a long-acting method, active from the first 24 hours, and very effective with a Pearl Index between 0.5 and 1%.

2.3.1.3 Oral Contraceptive Pills

There are three types of oral contraceptives: the combined oral contraceptive pill, the progestin-only pill (POP), and the extended-release pill. The estrogen-progestin pill remains by far the most prescribed contraceptive method. A study in the United States confirms that the contraceptive pill is the method of choice for about 25% of women (Cooper DB, 2022).

Combined oral contraceptives can be mini-pill (progesterone derivative with 20-35 mcg of Ethinyl estradiol) or normal-dose (50 mcg of ethinyl estradiol). Their Pearl index is around 0,15-0,7%.

POPs are classified as micro-dose progestin pills (30-600 mcg) and highly selective progestogen, which is structurally similar to 19-norprogesterone, with a Pearl Index of 1–1,6%.

Atrophy of the endometrium, thickening of the cervical mucus, blocking of ovulation, and the reduction of the motility of the fallopian tubes are the main modes of oral contraceptive pills action, while cardiovascular and thromboembolic disorders, the risk of ectopic

pregnancies, and breast tenderness are frequent inconveniences of oral contraceptives (ELONGI, 2015).

2.3.2 MECHANICAL CONTRACEPTIVES

2.3.2.1 Contraceptive Diaphragm

The contraceptive diaphragm, also called the vaginal diaphragm, is a shallow dome of silicone with a firm and flexible rim.

It is an easy-to-use method, with a Pearl Index of 2–4%, without influence on libido, and does not require a medical prescription. The diaphragm is placed at the bottom of the vagina to cover the cervix to prevent the passage of sperm to the fallopian tubes through the uterine cavity. It must be removed six to eight hours after sexual intercourse. However, its role in protecting against STIs is questionable.

When used properly, the vaginal diaphragm is only 86% effective, making it less effective than pills, intrauterine devices (IUDs), and implants. Some women complain of discomfort. The risk of latex allergy and genital trauma are not excluded (Reproductive & Sexual Health).

2.3.2.2 The Male Condom

The male condom is a latex device, measuring 18–20 centimeters in length and 3.5 centimeters in width, which is slipped over an erect penis to avoid direct contact with the vagina and prevent the release of ejaculated spermatozoa into the female genital tract. Condoms have the advantage of being easy to use at any age and provide protection against STIs and HIV infection. However, its Pearl Index varies from 0.5 to 8%, probably due to tears and poor handling. Like the vaginal diaphragm, male condoms carry a risk of latex allergies. Some users complain of reduced sexual pleasure and the need to remove the condom immediately after ejaculation.

It should be noted that the female condom and the cervical cap are also mechanical contraception methods.

Spermicides

Spermicides are chemicals capable of preventing egg fertilization by altering membrane permeability and destroying sperm. It is introduced in the vagina a few minutes before sexual intercourse to help in blocking the entrance to the cervix, so sperm cannot get to the egg. They are generally cheaper, affordable, easy to use, and do not require a medical prescription. Their efficacy against STIs makes them a preference for couples who want treatment against STIs.

However, there have been some reports of allergies to the chemicals in spermicides, and each year, about 28 out of every 100 women get pregnant even after the correct use of spermicides. Therefore, it is advisable to use spermicide along with another method, such as condoms or withdrawal.

2.3.2.3 Intrauterine devices

It is a device placed in the uterine cavity to prevent fertilization and, if necessary, implantation.

IUDs have a rich history in reproductive health. In 1909, Dr. Richard Richter made a flexible ring out of suture material and inserted it into the uterus with a serrated instrument, a feat that was attributed to him only 50 years later (Vranic, 2006).

IUDs are very effective, with a Pearl Index of 0.1%, and the return to fecundity is immediate after withdrawal. There are several types of IUDs (Paragard, Mirena, Liletta…). Scar fibrosis and endometrial atrophy are the modes of action of IUDs. In addition, spermatozoa inactivity is caused by the cervical mucus which becomes thin and thick as a result of progestogen action (Scommegna et al., 1970).

2.3.2.4 Sterilization (Permanent Contraception)

Sterilization is the most effective method besides abstinence. It can be done on both women and men. It consists of the bilateral section ligation of the uterine tubes in women, and vasectomy in men, a surgery that results in blocking the flow of spermatoids to the prostate.

2.3.3 NATURAL CONTRACEPTIVE METHOD

Natural methods use natural fertility signs to help a couple choose when to avoid sex to prevent pregnancy. The same signs can be used to help a couple choose when to have sex if they want to have a child. Successful natural FP requires a good understanding of the human reproductive process and the signs of fertility in women (World Health Organization, 1998).

Natural methods of contraception are used to this day in many countries. Apart from the old natural methods that have already been abandoned, such as vaginal irrigation and others, there are many natural methods of contraception that are effective, affordable, and acceptable.

2.3.3.1 The Withdrawal method or Coitus interruptus

It is a method based on the man's ability to withdraw the penis from the vagina during a sexual act before reaching ejaculation. However, it is sometimes difficult to control the pre-ejaculatory period. It is an easy and harmless method; however, its failure rate is high.

2.3.3.2 Lactational Amenorrhea Method

The contraceptive effect of breastfeeding lies in the antagonism of prolactin on the hypothalamic-pituitary-gonadal axis, leading to gonadotropin blockade and subsequent anovulatory cycles.

The lactational amenorrhea method requires that three conditions be met:

1) No return of menstruation after giving birth.
2) Inclusive and exclusive breastfeeding of the baby by the mother.
3) The baby must be less than six months old.

The conditions necessary for this method are full breastfeeding, including both exclusive breastfeeding and almost-exclusive breastfeeding (Family planning).

Under the above conditions, this method provides 98% protection during the first six months (ELONGI, 2015).

2.3.3.3 Cervical Mucus Method or Billings Ovulation Method

This method allows women to identify their fertile periods by observing their cervical mucus. Indeed, around the ovulation period, the mucus becomes stringy, abundant, and more fluid, thus, facilitating the flow of spermatozoa. For this method to be effective, one needs to know the characteristics of the cervical mucus, which can be disturbed by a vaginal infection.

2.3.3.4 Basal Body Temperature Method

This method involves the taking of a woman's temperature every morning upon awakening, before leaving the bed, and before eating or any activity. This temperature should be taken at a single site, preferably the rectum, and recorded in a logbook for the purpose of plotting and interpreting the temperature curve. The day of ovulation is recognized on the curve by the nadir point, which corresponds to the day of the lowest temperature in the middle of the cycle. It is then recommended that the couple has unprotected sex only after three days of hyperthermia following the nadir point until the appearance of menstruation. It is an easy method, with a Pearl Index of up to 6.6%, but sometimes restrictive because of the obligation to take the daily temperature.

2.3.3.5 Periodic abstinence method (Calendar method or the Knaus-Ogino method)

This calendar-based method has been in place since 1930 with the discovery of the ovulation period after independent studies by Ogino and Knaus. It was also a method suggested by the Church at the time (Labbok & Queenan, 1989), and is based on the length of the cycle, the probable day of ovulation, the life span of spermatozoa, and the life span of the egg after it is produced by the ovary. Considering that ovulation takes place in the middle of the cycle, on the 15th day of a 30-day cycle, the life span of the egg after ovulation is one day, and the life span of the spermatozoa is about three days in the female genital tract, the couple should avoid unprotected coitus for eight days, from the 11th to the

18th day. It is very important to note that this is a difficult method to use among women with less education and/or irregular menstrual cycles.

2.3.3.6 Necklace method or Collar method

This is a method of contraception that uses a chain on the hip, with a black ring and three colors: red for menstruation, white for the fertile period (which is not recommended for unprotected coitus), and brown for the non-fecund period, and is free for coitus. The black ring moves only in one direction, at the rate of one ring per day.

Figure 1. Types of contraceptive methods by the duration of action

Source: https://www.pinterest.com/pin/155937205837302737/

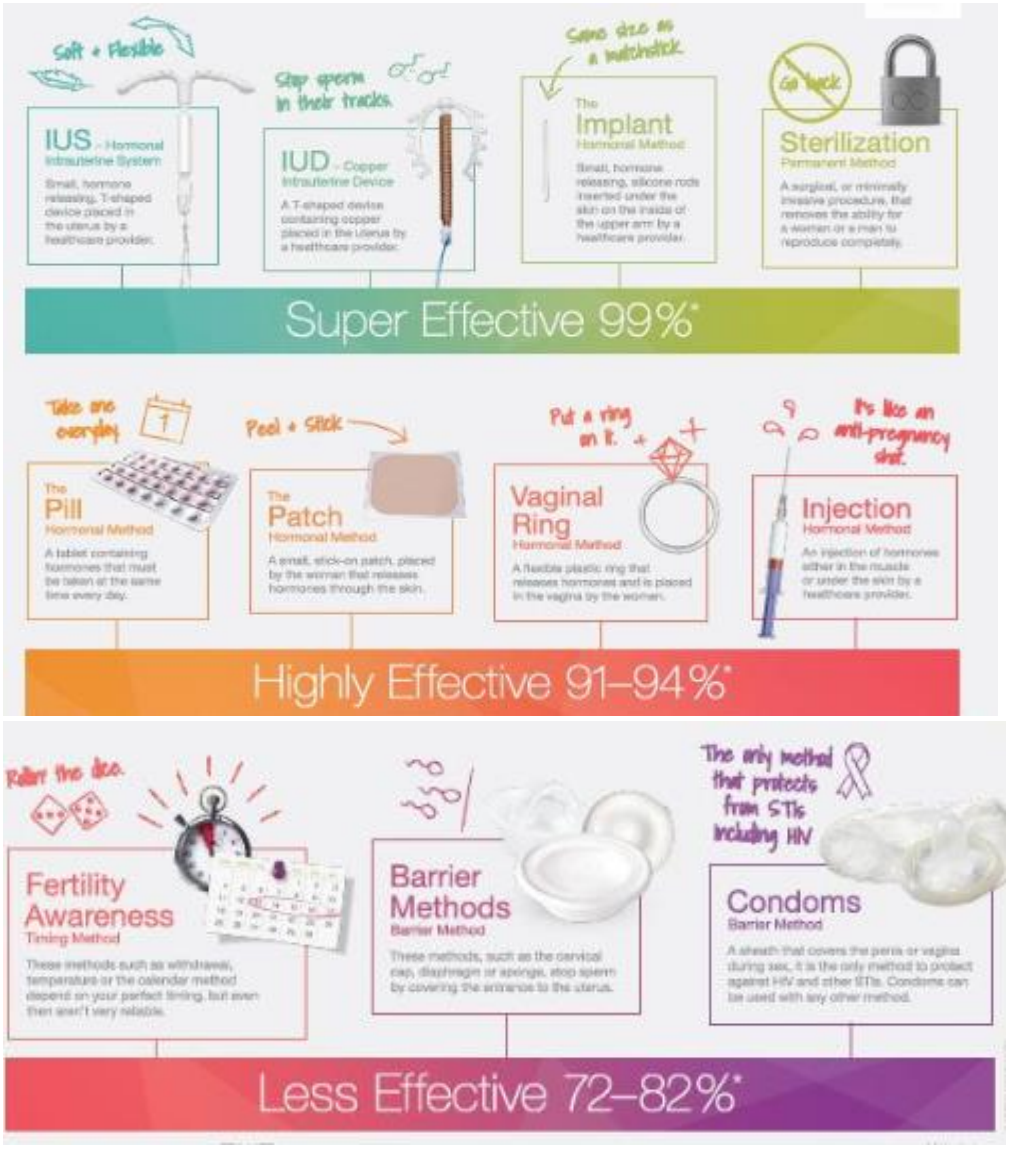

Figure 2. Types of contraceptive methods according to their effectiveness

Source : https://www.pinterest.com/pin/4503668369161616/?mt=login

2.4 OVERVIEW OF THE PLANNING PROCESS IN THE DEMOCRATIC REPUBLIC OF CONGO

The DRC is the third-largest country in sub-Saharan Africa, after Algeria and Sudan, with an area of 2,345,000 km^2 its capital is Kinshasa with a total population of approximately 92,377,986 in 2021 of which 50.1% were female and 45% under 15 years old. It is estimated that the population will reach 150 million by 2050 with an estimated current GDP per population of 584.1 in 2021 and a life expectancy of 61 years (The World Bank group, 2022).

Kinshasa is a megalopolis located in the west of the DRC. Together with Brazzaville, they are the two closest capitals in the world. Kinhasa's population is estimated at 15,628,085 inhabitants with an average annual growth rate of 4% and a projection of 26 million inhabitants by 2030 (Population, 2022). In 2010, about 23% of girls (15–19 years) gave live birth in Kinshasa (Augustin Kadiata Bukasa, 2022).

The national strategy 2021-2025 is to provide all Congolese of reproductive age with access to quality, affordable FP services, regardless of social class, geographic location, or political or religious affiliation (Ministry of health, 2021-2025).

Therefore, the government has a keen interest to access reproductive health care, as well as that of the mother and the young girl, as previously mentioned. To achieve its objectives, the government made a commitment to FP on November 15, 2013, at the 3rd International Conference on Family Planning in Addis Ababa, Ethiopia, created in 2001, by Ministerial Decree No. 1250/CAB/MINI/S/AJ/KIZ/009/2001, the National Reproductive Health Program "PNSR". It is an organ placed under the supervision of the Ministry of Health. It is also during this period that the man's co-responsibility as a spouse got integrated into reproductive health. [Several initiatives have been taken to reform laws, ensure funding for

FP and women empowerment, and prevent early marriages of young adolescents through education, awareness creation, and social integration.

The national reproductive health program has the following threefold mission:

i) Develop, disseminate and ensure the ownership of the national policy, the master plan, the organic framework, and the standards of reproductive health by the Congolese population as well as by stakeholders in this field.
ii) Coordinate, monitor, supervise, and evaluate reproductive health activities by ensuring the use of authorized data collection tools.
iii) Mobilize resources to support maternity hospitals and desirable birth units with gyneco-obstetric equipment, essential drugs, and contraceptives, to improve the health care quality as well as the training of personnel and the promotion of research in the reproductive health (PNSR).

Despite the innumerable difficulties and budgetary constraints, the government has made FP one of the six high-impact priorities within the framework of the acceleration of Sustainable Development Goals 4 and 5 of the Millennium Declaration.

Thus, the Strategic Plan for Family Planning 2014–2020 has two main objectives:

i) To increase modern contraceptive prevalence from an estimated 6.5% in 2003 to at least 19% by 2020.
ii) To ensure access to and use of modern contraceptive methods by at least 2.1 million women by 2020. (Ministry of health, 2014-2020).

The evidence shows a prevalence of only about 15.5% in 2020 with a projection of 1.5% per year to reach 23% by 2025(Ministry of health, 2021-2025).

Six secondary objectives were identified: to secure government commitment to FP; to improve access to FP services in both the public and private sectors; to increase the quality of services provided; to stimulate demand; to develop an efficient logistics system for contraceptive commodity management; and to implement a monitoring and evaluation system ((Ministry of health, 2014-2020).

Despite the government's support, FP still faces major challenges in the DRC, particularly with respect to contraceptive security, which consists of maintaining a satisfactory level of flow of contraceptives to the country's clinical facilities requiring these products, thanks to the selection of commodities, anticipation of needs, supply, delivery, storage, distribution and evaluation of this entire process. In a survey conducted in 2021 in the city of Kinshasa, it was found that stock-outs of the pill and male condoms in public health care sites had increased and were more frequent in public healthcare sites than in private ones (Public Health; and Jhpiego., 2020). Currently, FP services are offered by public and private institutions in the city of Kinshasa and throughout the entire country.

2.5 FACTORS ASSOCIATED WITH CONTRACEPTIVE USE

The DRC is undoubtedly one of the most multi-ethnic countries in Africa, with people of many origins, cultures and speaking different languages.

The use of modern contraceptive methods by women in the DRC, particularly in Kinshasa, is influenced by several factors at different levels.

2.5.1 Socio-economic, demographic and cultural Factors

The DRC, like all of sub-Saharan Africa, has a population that is strongly linked to culture. The influence of religion and ethnicity is evident in many areas of life.

From a community and cultural perspective, there are many Africans. The respect of the culture by the community and the individual, each in the role and the place that he gives himself, not only creates an effective balance between the individual and his community, but also a happy meeting with modernity. This is a characteristic of sub-Saharan Africa (Ky-Zerbo, 2012).

In general, customary, religious, and cultural considerations prevail over the idea of restricting pregnancy or maternity. Children are considered a gift from God, a blessing for the couple. Contraceptive methods are sometimes seen as a Western way of controlling local populations. This perception of birth control hinders the effectiveness of FP, especially in rural areas.

Some religions, such as Islam, which enshrines polygamy, places women in a situation of competition with each other so that the woman who has more children believes she is entitled to greater attention of or benefits from her husband.

In some ethnic groups in the center of the DRC, having more children is a sign of wealth, because even when one has no means to support oneself, one hopes that having more children will offer the possibility of a better life potentially assured by one's children in the future, and will allow one to maintain and expand one's progeny.

The remarkable impact of the environment on the FP process is well documented. Rural women do not have guaranteed access to information, compared to women in large cities. In about 34% of cases, a specific contraceptive method was used in rural cities, compared to about 49% in urban cities of Bangladesh (Uddin et al., 1985).
Age is an important factor in contraceptive use and choice. In 2019, of the world's 1.9 billion women, 57.8% were of reproductive age and wanted to plan their pregnancies; of these, 842 million were using contraceptives and 270 million had an unmet need for contraception (W.H.O, 2020).

In sub-Saharan Africa, only 9% of modern female contraceptive users were aged 15–19 years between 1995 and 2020, with an average age of 28.5 ± 0.02 years among the total female contraceptive users (Boadu, 2022).

2.5.2 Women's empowerment

African families and couples are based on the concept of the man being the head of the family and the decision-maker, while the woman is the submissive partner and homemaker, taking care of the children. Thus, the woman's role is more biological than social, whereas that of the man is to control all the means of production of the household. The trend is reversing nowadays thanks to different commitments made by governments to empower women and enhance their active participation in decision-making. Factors that affect this empowerment are certainly the level of education of the woman compared to that of her spouse and the age difference between the spouses.

According to a USAID study in 2014, the agricultural sector contributes 42.5% to the growth of national production in the DRC. Women tend to be concentrated in agriculture and represent 84% of the labor force (Dibie, 2018).

In a study published in 2018 on women's empowerment in sub-Saharan Africa, the amount of wealth in a household influenced contraceptive use. When a woman resides in a household with a high wealth quantum, she becomes more likely to use a contraceptive than when she does not; this same trend is observed among women who have an occupation compared to those who do not (Yaya et al., 2018). In the DRC, the number of living children a woman has seems to slightly influence her ability to dispose of her income. The proportion of women who are the main decision-makers on the use of their income increased from 27% among those with no living children to 28% among those with one or two children and then to 31% among those with three or four children. The difference by area of residence is greater: nearly five out of ten urban women (46%) decide how to use their income, compared to 21% in rural areas (Ministère du Plan et Suivi de la Mise en œuvre de la Révolution de la Modernité - MPSMRM/Congo et al., 2014).

Couples often make joint decisions when the woman has a paid job, otherwise, the man's decision prevails as the head of the household. Women's empowerment is certainly one of how the reproductive health experience can be influenced and maternal morbidity and mortality reduced. This empowerment could lead to significant positive changes in many areas.

2.5.3 Knowledge and access to Family Planning services

The introduction of new information and communication technologies has contributed significantly to improving access to information, including that of reproductive health and FP. In rural areas, many health systems use community outreach workers. It is unequivocal that contraceptive use is directly or indirectly linked to access to information on contraceptive methods. However, in addition to access to information, several African countries, including the DRC, remain focused on the availability of contraceptives, which is one of the major challenges in birth control. Among facilities offering any FP services, nine out of ten (90%) made these services available at least five days a week. This high level of availability was virtually the same regardless of the type of facility, the sector to which it belonged, the area in which it was located, or the province. However, availability was lowest in Sankuru (72%), East Kasai (71%), Lomami, and South Ubangi provinces (66% each). Fewer than one in ten facilities (8%) offered any FP service less than five days a week in DRC. Nearly three-quarters of the facilities (73%) offering FP services had at least one provider interviewed who reported receiving ongoing training in some aspect of FP in the 24 months prior to the survey. This proportion was highest in hospitals (86%) compared to other types of facilities. Public sector facilities had the lowest proportion (70%) of providers trained in FP compared to other sectors, and higher in urban areas (85%) than in rural areas (69%) (Ecole de Santé Publique de Kishasa ESPK/Kinshasa & ICF, 2019).

Compared to the 2007 DHS-DRC, the level of knowledge of methods has increased relatively among both women and men, and the order of methods has changed slightly.

Among women in unions with a partner, 77% were aware of a modern method in 2007 compared to 90% in 2013. The proportion of women in unions who were aware of the male condom, which was already the most familiar modern method, increased from 67% to 83%, and the proportion who were aware of injectables increased from 42% to 64% (Ministère du Plan et Suivi de la Mise en œuvre de la Révolution de la Modernité - MPSMRM/Congo et al., 2014).

2.5.4 Reproductive Factors

In the DRC, as in many other African countries, the number of children a couple desires is also determined by the woman's gynecological and obstetrical background, which is about pregnancies that have or have not been carried to term or pregnancies where fetuses have or have not reached the age of viability. The background could also include a personal experience or information on maternal-fetal mortality.

The preference of the sex of the child is one of the factors that have a negative influence on contraception. Some couples have more children simply in an attempt to beget a female or male child, as the case may be, to meet a customary or cultural need. Conversely, different studies found that, in African societies, couples who have more children require contraception the most.

In 2020, of 1000 live births, 70 male children died before reaching one year of age; the crude birth rate was 40 per 1000 people, with a fertility rate of 5.7 per woman in the DRC ((The World Bank group, 2022).

In Worawora Township, Ghana, 34% of couples with no children did not use contraception, while those with more than three children used a contraceptive method in 73% of cases (Manortey & Lotsu, 2017).

In a 2013 study in Nigeria, out of 13835 married women of childbearing age who did not need children, 6702 had five or more children, which is about 48.2% of women (Ejembi et al., 2015).

It is important to note that in African societies there are factors that promote contraception, and others that hinder it.

It is important to note that in African societies there are factors that promote contraception and others that hinder it.

The long period of breastfeeding after childbirth is one of the factors that contribute to this. This factor is reinforced by the fact that the woman is taken care of by an assistant, who is generally a woman experienced in traditional postpartum care, coitus is forbidden during this period, which can last for at least three months.

Conversely, difficulties in sharing knowledge about sexuality within families, certain religious recommendations and cultural practices, lack of information, lack of qualified personnel, and lack of availability of contraceptives are factors that hinder contraception in general.

2.6 CONCEPTUAL FRAMEWORK OF FACTORS ASSOCIATED WITH CONTRACEPTIVE USE IN THE DEMOCRATIC REPUBLIC OF CONGO

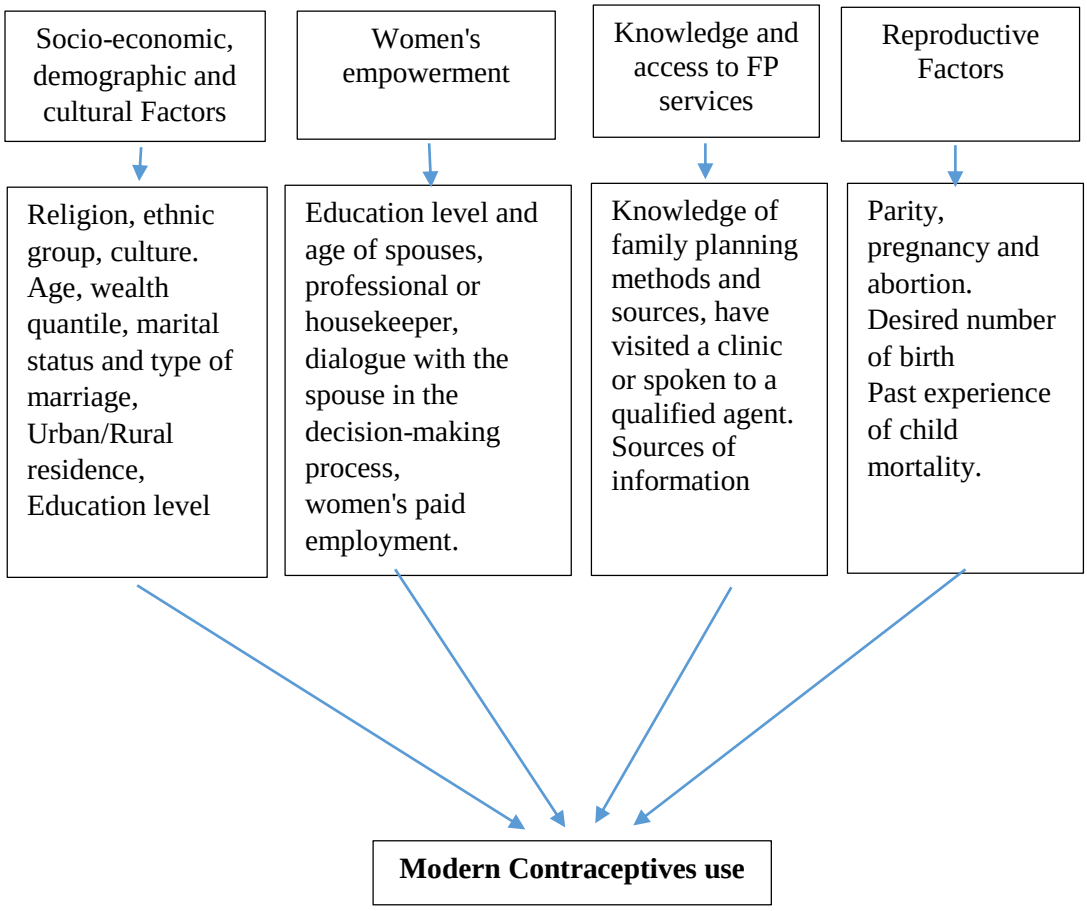

Figure 3. Conceptual framework

3. MATERIALS AND METHOD

3.1 STUDY DESIGN

This is a cross-sectional study conducted in the city of Kinshasa, the capital of the DRC, to determine the factors that influence the use of modern contraceptives in 2020, using secondary data coming from the Performance Monitoring for Action (PMA).

3.2 PRESENTATION OF PERFORMANCE MONITORING FOR ACTION SURVEY

The PMA is an international organization with headquarters in Baltimore, USA, and representation in the DRC, with support from the John Hopkins Bloomberg School of Public Health, Johns Hopkins Program for International Education in Gynecology and Obstetrics (Jhpiego), and Bill & Melinda Gates Institute for Population and Reproductive Health, with the collaboration of the Kinshasa High School of Public Health.

The PMA's primary work is to collect data on changes in key indicators of FP and reproductive health, decision-making, and contraceptive autonomy to understand the determinants of contraceptive use in the DRC. These indicators are measured through household and women's surveys, cross-sectional and longitudinal data generation, panel surveys at service delivery points, and exit surveys. These surveys currently cover eight countries: Burkina Faso, Côte d'Ivoire, the Democratic Republic of Congo, India, Kenya, Niger, Nigeria, and Uganda (Public Health; and Jhpiego., 2020).

3.3 POPULATION

Women of childbearing age (15–49) living in Kinshasa city during the study period.

3.3.1 Inclusion and Exclusion criteria

3.3.1.1 Inclusion Criteria

All women of childbearing age, living in the study areas and aged between 15 and 49 years were included in this study.

3.3.1.2 Exclusion criteria

i) Any woman below 15 years or more than 49 years.
ii) Any woman no longer living in the survey area or who was absent at the time of the survey.
iii) Any woman with an incomplete survey or who refused to answer the questions.

3.4 SAMPLING AND DATA COLLECTION

The survey sample is based on a multi-level cluster design using urban-rural and large-area strata. A representative number of geographic clusters are sampled in collaboration with the National Institute of Statistics of the DRC. Thirty-five households were randomly selected using a multi-stage cluster design based on rural and urban strata after a complete listing of each enumeration area. The final sample included 2611 de facto women in Kinshasa aged 15–49 who completed the interviews. Data collection was conducted between December 2019 and February 2020.

The women's survey is integrated into the household survey, with one set of questions for all women of reproductive age (15–49) living in each household.

The following formula was used to determine the final sample size:

$$n = \frac{z^2_{1-\frac{\alpha}{2}} p_{(1-p)}}{\delta^2 * Ri * Rj}$$

Where:

i) n: sample size of women
ii) Z: abscissa of normal curve (at α=0.05, Z=1.96)
iii) DEFF is the design effect (maximum: 3.0);
iv) P: estimated
v) δ: margin of error;
vi) R_i: individual response rate;
vii) R_h: household response rate

A survey questionnaire was used for the study participants after informed consent was given on the consent form in the survey area.

The survey questionnaire includes questions on knowledge and practice of FP activities in the DRC.

This survey included several types of questionnaires:

i) Post-counseling client questionnaire
ii) Cross-sectional questionnaire on women
iii) Female panel questionnaire
iv) Household questionnaire
v) Health service site questionnaire

Only the female questionnaire was considered. Details of the questionnaire can be found in the appendices.

3.5 DATA ANALYSIS

The survey data were entered and coded by a qualified team in Excel. Data analysis was done using Jamovi software version 2.2.5.

Descriptive statistics and a chi-square test (P value < 0.05 for statistical significance) were used to summarize and present the frequency distribution and percentages of variables.

A logistic regression analysis with a 95% confidence interval and odds ratio value was used to estimate the association between the independent variables and the modern contraceptive method.

3.6 VARIABLES

3.6.1 Dependent variable

The dependent variable chosen in this study is the use of modern contraceptive methods by women. It is a binary variable with two values: use (yes=1) and non-use (no=0). Women who used any modern contraceptive method were considered “users”, while those who never used any modern contraceptive method were considered “non-users.”

The following methods are considered modern contraceptive methods in this study: Pills, emergency contraception, condoms, injectables, implants, IUDs, sterilization, cervical diaphragms, vaginal method (inserting jelly).

3.6.2 Independent variables

The independent variables retained in this study are the following:

3.6.2.1 Sociodemographic variables

3.6.2.1.1 Age

The women included in this study are those between the ages of 15 and 49 during the study period. This continuous variable is divided into 4 age groups as follows:

i) 15-22
ii) 23-31

iii) 32-40

iv) 41-49

3.6.2.1.2 Marital status

This qualitative variable has the following 2 categories:

i) Married

ii) Unmarried or single

3.6.2.1.3 Woman's level of education

It is about knowing the highest level of education achieved by the respondent. This is a qualitative ordinal variable divided into 4 categories: Never, primary, secondary and tertiary.

3.6.2.1.4 Religion

The qualitative variable religion denotes the belief or church attended by the woman. The men categories are: Catholic, Protestant, Kimbanguiste, others Christians (which includes revival churches and others), Muslims, others religions (salvation army, Vuvamu, Animist, Bundu and others) and no religion.

3.6.2.2 Women's empowerment decision making

3.6.2.2.1 Decision making

In the decision-making process, partner involvement refers to the couple’s involvement in the decision to use a modern contraceptive methods and focusing on the discussion of modern contraceptive use and FP by the couple. It is a binary variable with Yes and No as values.

3.6.2.2.2 Occupation

These are the respondents who had occupations during the survey period. This variable is dichotomized as Yes and No.

3.6.2.2.3 Household size

This refers to the number of individuals belonging to and living in the household at the time of the survey. It is categorized into 1–5, 6–10, 11–15, and 16–20 persons.

3.6.2.3 Reproductive factors

3.6.2.3.1 Birth event

This birth event variable informs about the obstetrical antecedents of the woman, especially all the births previous to the date of the survey, apart from the abortions. It is a dichotomized variable. *Yes*, for those who have already given birth at least once, and *No* for those who have never given birth.

3.6.2.3.2 Birth desire

This categorical variable represents whether the respondent wishes to have a child in the future (0, 1–3, 4–6, 7 and over birth).

4. RESULTS

4.1 Frequency distribution of use according to modern contraceptive type

Table 1. Frequency distribution of use according to modern contraceptive type

	Current user	
MC Method	No	Yes
Emergency Contraceptive	983(90.3 %)	106(9.7 %)
Female sterilization	1075(98.7 %)	14(1.3 %)
Implant	921(84.6 %)	168(15.4 %)
Injectable	1017(93.4 %)	72(6.6 %)
Intra uterine device	1085(99.6 %)	4(0.4 %)
Male condoms	908(83.4 %)	181(16.6 %)
Pill	1050(96.4 %)	39(3.6 %)

An analysis of the results on modern contraceptive use by women shows a steady trend in the choice of contraceptive method. Male condoms, implants, emergency contraception, injectable and pills are the most used methods by women.

Male condom was the most used method by respondents at 16.6%, followed by implants by 15.4% of respondents. The emergency contraception use rate was 9.7% while injectable contraceptives were not widely used by respondents. Only 6.6%, representing 72 women were users.

The less used modern contraceptive methods were pills, female sterilization, and IUDs, with 3.6%, 1.3%, and 0.3% of users respectively.

4.2 General characteristics of the study population

Table 2. General characteristics of the study population

Predictors	n= 2611(%)	Current modern contraceptive user	
		No (75.8)	Yes (24.2)
Age Mean (SD)* **	**28.3(9.47)**		
15-22	905(34.7 %)	753(83.2 %)	152(16.8 %)
23-31	777(29.8 %)	517(66.5 %)	260(33.5 %)
32-40	571(21.9 %)	404(70.8 %)	167(29.2 %)
41-49	358(13.7 %)	305(85.2 %)	53(14.8 %)
Marital status			
Unmarried	1915(73.3 %)	1466(76.6 %)	449(23.4 %)
Married	696(26.7 %)	513(73.7 %)	183(26.3 %)
Woman's level education* **			
Never	10(0.4 %)	7(70.0 %)	3(30.0 %)
Primary	200(7.7 %)	134(67.0 %)	66(33.0 %)
Secondary	1903(72.9 %)	1479(77.7 %)	424(22.3 %)
Tertiary	498(19.1 %)	359(72.1 %)	139(27.9 %)
Religion			
No religion	86(3.3 %)	60(69.8 %)	26(30.2 %)
Catholic	513(19.6 %)	380(74.1 %)	133(25.9 %)
Protestant	285(10.9 %)	206(72.3 %)	79(27.7 %)
Kimbanguiste	87(3.3 %)	64(73.6 %)	23(26.4 %)
Others christian	1241(47.5 %)	962(77.5 %)	279(22.5 %)
Muslim	44(1.7 %)	34(77.3 %)	10(22.7 %)
Others religion	355(13.6 %)	273(76.9 %)	82(23.1 %)

Missing			
Partner involvement**	n= 1088		
No	265(24.4 %)	103(38.9 %)	162(61.1 %)
Yes	823(75.6 %)	395(48.0 %)	428(52.0 %)
Occupation*			
No	1636(62.7 %)	1263(77.2 %)	373(22.8 %)
Yes	974(37.3 %)	715(73.4 %)	259(26.6 %)
Household members***			
1-3	1018(39.0 %)	793(77.9 %)	225(22.1 %)
4-10	1352(51.8 %)	1031(76.3 %)	321(23.7 %)
11-15	212(8.1 %)	143(67.5 %)	69(32.5 %-
16-20	29(1.1 %)	12(41.4 %)	17(58.6 %)
Birth event***			
No	1065(40.8 %)	898(84.3 %)	167(15.7 %)
Yes	1546(59.2 %)	1081(69.9 %)	465(30.1 %)
Birth desire***			
0	1240(47.5 %)	976(78.7 %)	264(21.3 %)
1-3	589(22.6 %)	414(70.3 %)	175(29.7 %)
4-6	530(20.3 %)	382(72.1 %)	148(27.9 %)
7 and over	252(9.7 %)	207(82.1 %)	45(17.9 %)

*P <0.05, ** P<0.01, ***P<0.001.

Statistical analysis of respondents according to their sociodemographic characteristics, women's autonomy and reproductive factors showed a statistically significant distribution of age, women's level of education, their partners' involvement in FP discussions, and household size, whether the respondent had an occupation during the survey period, whether the woman had already given birth and other obstetrical history, and her desire for future birth.

The prevalence of modern contraceptive use among women in Kinshasa during the survey period was 24.2%.

The average age of participants was 28.3 years.

The majority of participants were younger women aged 15–22 years representing 34.7%. Among them, only 16.8% were users of modern contraceptive methods against 83.2% of non-users, while respondents aged 23–31 years representing 29.8% of respondents were users in 33.5%. Among the older women, who represented 21.9% and 13.7% of respondents respectively, 29.2% of modern contraceptive users were aged 32–40 and 14.8% were aged 41–49 ($P<0001$).

Most of the respondents were unmarried, representing 73.3% of the study population, of whom 23.4% used modern contraceptives, while 26.3% of the married women were users although the distribution is not statistically significant.

Approximately 72.9% of the respondents had secondary education and 19.1% had tertiary-level education. Among the respondents with primary education representing 7.7% of study population, 33% used modern contraceptives, while those with secondary education used 22.3%. Those who had never studied used modern contraceptives in 30% of cases, and 27.9% of women with tertiary education also used modern contraceptives. This distribution is not statistically significant.

Among Catholic respondents, 25.9% were users of modern contraceptives. The majority of women belonged to other Christian churches, of which 22.5% were users. Of 44 Muslim women, 10 used modern contraceptives, or 22.7%, while 72.3% of Protestant women did not. These distributions are not statistically significant.

Regarding the decision to use modern contraceptives, the respondents' partners were involved in 75.6% of cases, i.e., 823 partners, while 265 (24.4%) of the partners of the respondents were not involved in the decision to use modern contraceptives. Among respondents whose partners were involved in the decision to use modern contraceptives,

52% were using modern contraceptives. Of the total, 61.1% of the respondents, whose partners were not involved in decision-making, used modern contraceptives.

About 37.3% of the respondents had occupations during the survey. Of these, 26.6% were using modern contraceptives. However, the majority of respondents were not employed, representing 62.7% of the study population. Of these, 22.8% were using modern contraceptives.

Among 1065 (40.8%) respondents who had never given birth, 15.7% used modern contraceptives, while among 1546 (59.2%) respondents who had given birth at least once, 30.1% used modern contraceptives.

The findings also showed that among women who had one to three children, 29.7% used modern contraceptives, while 27.9% of those who had four to six children used them. About 9.7% of the respondents wanted seven or more children, and among them, 82.1% were not using modern contraceptives. However, several participants (47.5%) did not want to have a child or another pregnancy. Among them, 21.3% were contraceptive users.

4.3 Factors associated with modern female contraceptive use

Table 3. Factors associated with modern contraceptive use among women in Kinshasa

	Current modern contraceptive user	
Predictors	**n= 2368(%)**	**Odds (CI 95%)**
Age Mean (SD)	28.3(9.47)	
15-22	905(34.7 %)	1
23-31	777(29.8 %)	2.491(1.981-3.133)***
32-40	571(21.9 %)	2.048(1.594-2.631)***
41-49	358(13.7 %)	0.861(0.613-1.209)
Marital status		

Unmarried	1915(73.3 %)	1
Married	696(26.7 %)	1.165(0.954-1.421)
Woman's level education		
Never	10(0.4 %)	1
Primary	200(7.7 %)	1.149(0.288-4.59)
Secondary	1903(72.9 %)	0.669(0.172-2.6)
Tertiary	498(19.1 %)	0.903(0.23-3.54)
Religion		
No religion	86(3.3 %)	1
Catholic	513(19.6 %)	0.8080.49(1.333)
Protestant	285(10.9 %)	0.885(0.522-1.501)
Kimbanguiste	87(3.3 %)	0.829(0.428-1.608)
Others christian	1241(47.5 %)	0.669(0.415-1.08)
Muslim	44(1.7 %)	0.679(0.292-1.575)
Others religion	355(13.6 %)	0.693(0.411-1.168)
Missing	41	
Partner involvement	n= 1088	
No	265(24.4 %)	1
Yes	823(75.6 %)	0.689(0.519-0.914)*
Occupation	n=2610	
No	1636(62.7 %)	1
Yes	974(37.3 %)	1.227(1.021-1.473)*
Household members		
1-3	1018(39.0 %)	1
4-10	1352(51.8 %)	1.097(0.904-1.332)
11-15	212(8.1 %)	1.701(1.231-2.349)**
16-20	29(1.1 %)	4.993(2.35-10.609)***
Birth event		

No	1065(40.8 %)	1
Yes	1546(59.2 %)	2.313(1.898-2.819)***
Birth desire		
0	1240(47.5 %)	1.244(0.877-1.765)
1-3	589(22.6 %)	1.944(1.346-2.808)***
4-6	586(22.4 %)	1.782(1.226-2.591)**
7 and over	196(7.5 %)	1

*P <0.05, ** P<0.01, ***P<0.001.

A logistic regression analysis with 95% confidence interval, odds ratios and P:<0,05 for nine predictors selected during this study enabled us to make the following observation: Modern contraceptive use is strongly associated with age, partner involvement, household size, obstetric history, and the number of children desired.

.Marital status, educational level of respondents, and religion showed no statistically significant relationship with modern contraceptive use by women in Kinshasa.
Age significantly influences modern contraceptive use by women in Kinshasa during the study period.

Older women are statistically twice as likely to use modern contraceptives as women in the youngest age group, except for those aged 41–49 years, who showed a negative likelihood (0.86) of using modern contraceptives compared with their younger counterparts in the reference group, although this latter distribution is not statistically significant. Studies show that women's likelihood of using modern contraceptives decreases as they age.

Married women were 1.16 times more likely to use modern contraceptives than unmarried women, even though this distribution is not statistically significant.

Having a primary education makes a woman 1.149 times more likely to use modern contraceptives than a woman who has never studied. However, women with secondary

education were less likely to use modern contraceptives than the reference women, while those with tertiary education had almost the same likelihood of using them as women who had never studied.

Women who are affiliated to a religion are less likely to use modern contraceptives than women with no religion. Catholic women have negative odds (0.8 times) of using modern contraceptives than women with no religion. The same is true for Protestant women (0.88), Muslim women (0.67), and women of other Christian religions (0.66). However, all these spiritual beliefs or religions did not show a statistically significant influence on modern contraceptive use.

A few discussions, although very important, did not show a positive influence on the use of modern contraceptive methods. Women who discussed contraception with their partners or husbands were less likely to use modern contraceptives than those who did not discuss it with their partners (Odds:0.69).

The results of our Women's Empowerment Study show that having an occupation increased the likelihood of using a contraceptive. Women who had an occupation at the time of the study were 1.22 times more likely to use modern contraceptives than those with no occupation.

Household size significantly influences modern contraceptive use in Kinshasa. As household size increases, the likelihood of using modern contraceptives also increases. Women living in households with more than five people were more likely to use modern contraceptives than those living in households with fewer than six individuals. In other words, women in households of 16–20 people were five times more likely to use them than those in households of one to five people. Participants from households of 11–15 individuals were 1.7 times more likely to use modern contraceptives than those from reference group households.

Having given birth at least once positively and significantly influenced modern contraceptive use in the study population. Women who had given birth at least once were 2.31 times more likely to use modern contraceptives than those who had never given birth. In the same vein, the desire for future birth influenced the choice to use modern contraceptives. Women who wanted fewer children were more likely to use modern contraceptives than those who wanted more than six children. Women who no longer wanted children were 1.24 times more likely to use a modern contraceptive method than their counterparts who wanted seven or more children. The same is true for those who wanted one to three children (1.94 times) and four to six children (1.78 times). All were more likely to use modern contraception than women in the reference group.

4.4 Frequency of modern contraceptive use by age of respondent

Tableau 4. Frequency distribution of modern contraceptive methods by respondent age

	Respondent's age			
MC Method	15-22	23-31	32-40	41-49
EC ***	38(35.8 %)	48(45.3 %)	18(17 %)	2(1.9 %)
Female sterilization***	0(0%)	0(0%)	5(35.7 %)	9 (64.3 %)
Implant***	21(12.5 %)	60(35.7 %)	67(39.9 %)	20(11.9 %)
Injectable	10(13.9 %)	37(51.4 %)	19(26.4 %)	6(8.3 %)
Intra uterine device	0(0%)	1(25.0 %)	3(75.0 %)	0(0%)
Male condoms***	58(32%)	76(42%)	37(20.4 %)	10(5.5 %)
Pill	8(20.5 %)	13(33.3 %)	11(28.2 %)	7(17.9 %)

*P <0.05, ** P<0.01, ***P<0.001, EC: Emergency contraceptive.

The results show that male condoms, implants, IUDs, emergency contraception, pills, injectable contraceptives, and female sterilization, are the methods used by women in Kinshasa, in different proportions according to age. Distributions on emergency contraceptives, male condoms, implants, and female sterilization are statically significant.

During the study period, implants, IUDs, and injectables were used much more by women aged 23–40 than women in more extreme age groups, while male condoms and emergency contraceptives were used more by women aged 15–31 than by older women. The pill was used mainly by women aged 15–40 than older women. The most common contraceptive method used only by older women was female sterilization.

Among male condom users, 42% were aged 23–31 and 32% were aged 15–22, compared with 20.4% of women aged 32–40 and 5.5% of women aged 41–49.

In 35.8% and 45.3% of cases, emergency contraception was used by respondents aged 15–22 and 23-31 years, while for women aged 32–40 and 41–49 years, the percentage of users were 17 and 1.9 respectively.

It turns out that among users of IUDs, 75% were aged 32–40 years and 25% were 23–31 years. Thus, it is likely that women in the two extreme age groups (younger and older) were not using IUDs, although this distribution is not statistically significant.

The implant is a significant cross-generational contraceptive with a distribution of 12.5% (15–22 years), 35.7% (23–31 years), 39.9% (32–40 years), and 11.9% (41–49 years).

5. DISCUSSION

This study aimed to determine the factors influencing the use of modern contraceptives by women aged 15–49 years in Kinshasa. Using logistic regression analysis, the findings show that modern contraceptive use is significantly associated with respondents' age, partner involvement, household size, obstetrical history, and desire for future births.

Contraceptive prevalence is 24.2%. These data show a certain evolution compared to the 6.5%, 5.4%, and 8% recorded during the surveys conducted in 2003, 2010, and 2014, respectively, in the city of Minembwe, province of Sud-Kivu in the DRC (Kaniki, 2019). This increase could be explained by the ease of access to FP products and services, as well as the high population density in the city of Kinshasa compared to Minembwe City. This improvement is still small compared to the number of non-users and the constant growth of the population, with a reproduction rate of 5.7 in DR Congo.

Age is a significant determinant of modern contraceptive use in Kinshasa. Analysis of the results shows that older women are statistically twice as likely to use modern contraceptives as women in the youngest age group (15–22). These results are similar to those of Ahmad Kamran Osmani et al. who found that women below 20 years were significantly less likely to use contraceptives compared to their older counterparts in sub-Saharan Africa (Ahmed et al., 2019). This could be explained by the fact that younger women may be newly married and desire children more than older women who may have already fulfilled their desired number of children, hence, the high use of modern contraceptives by women aged 23–40. In contrast, older women aged 41–49 showed a negative likelihood (0.86) of using modern contraceptives compared with their younger counterparts in the reference group. These results also show that this susceptibility decreases with increasing age; as age increases, women become less likely to use contraceptives. The occurrence of menopause in some cases and the likely preference for another, non-modern contraceptive method or the fact that some women still find the subject taboo could explain the low use by women aged 41–49.

The couple's discussion of the appropriateness and value of using a contraceptive method to regulate births is a fundamental element to be taken into account in the study of influencing factors. During the study period, women who discussed contraception with their partners or husbands were less likely to use modern contraceptives than women who did not discuss it with their partners or husbands (Odds: 0.689). This assertion could be explained by the fact that in African societies, particularly in DR Congo, women, although submissive to men in a conjugal union, retain a certain autonomy on matters in which they are called upon to play a leading role in a context where many contraceptive methods have been designed for use by women. These results corroborate those of Freddy Rukema Kaniki, who points out that in 40% of cases husbands are responsible for the non-use of modern contraceptives by women in the province of South Kivu in DR Congo. (Kaniki, 2019)

Findings show a positive influence of increasing household size on women's use of modern contraceptives. In households with more than 16 members, women are five times more likely to use modern contraceptives than women in households with one to five members. As household size increases, women are more likely to use modern contraceptives. These results are consistent with those of a study of household structure and contraceptive use in Nigeria, which found that in households with more than five members, women were 1.55 times more likely to use contraceptives than in households with fewer than five members (Fadeyibi et al., 2022). African societies are marked by the hospitality of wealthy family members towards other members who lack the means to survive. It is in this context that we find in several households sometimes several members other than the couple's children. The social and economic conditions of the population in general and of households in particular force couples, especially women, to think more carefully before considering a new pregnancy.

There is a significant association between a woman's obstetrical history, her desire to give birth again, and the use of a modern contraceptive method.

Women with at least one obstetrical history event (birth) were 2.31 times more likely to use modern contraceptives than women who have never given birth. In Zambia, Lasong et al. also found that women who had given birth five or more times were 8.02 times more likely to use modern contraceptives than women who had never given birth (Lasong et al., 2020). This result could be explained by the fact that according to many social cultures in DR Congo, it is not advisable to have a child or to be sexually active before marriage. Considering that in this study most women were not married, they would probably refuse to become pregnant again after an obstetrical history.

Women who want fewer children in the future used modern contraceptives more than women who wanted more than six children. Women who did not want any more children were 1.24 times more likely to use modern contraceptives than those who wanted seven and more, while women who wanted one to three children were twice as likely to use them as those who wanted seven or more (Odds: 1.944). These results are similar to those of Ahmed Islam who found in a study conducted in Bangladesh that women who did not want any more children were 2.504 times more likely to use modern contraceptives than those who wanted more. The explanation for this similarity is that the need for future births is matched by the financial capacity of couples to ensure the growth and development of children, which is not the case in many poor countries such as DRC and Bangladesh (Islam et al., 2016).

Strengths and limitations

The strengths of this study include a cross-sectional study design with a relatively large sample size (n=2611) providing information on recent data on most determinants of modern contraceptive use in Kinshasa, with probable integrity on key points, thus, revealing several findings. Female age, occupation, and obstetrical history may play a role in the prevalence of modern contraception.

Various limitations should be taken into account when interpreting the results of the study:

i) This study facilitates the assessment of the association between the predictors and the dependent variable but does not consider the causal relationship.

ii) These results may not be generalized over the whole city of Kinshasa with its 15 million inhabitants, considering ethnic and cultural diversity.

iii) There is limited information about the culture and respondents' residential locations.

However, this study could provide a basis for future research opportunities.

6. CONCLUSION

This study identified the factors that influence the use of modern contraceptives among women in the Democratic Republic of Congo's Kinshasa city. Data from cross-sectional PMA 2020 surveys were used to assess the association between different predictors and modern contraceptive use through logistic regression.

Age was identified as a significant determinant of modern contraceptive use. Older women are more likely to use modern contraception than women in the reference group except the oldest, and their likelihood of use diminishes as they age. Women are most likely to use modern contraceptives when they do not discuss the topic with their husbands or partners. As household size increases, women's use of modern contraceptives is positively affected. The same applies to women who have given birth compared to those who have never given birth. When a woman wants fewer children, she is more likely to use these contraceptives than when she wants more. Male condoms, emergency contraceptives, and pills were used more by younger women while the most common contraceptive method used only by older women is female sterilization.

Political Implications: In a country with a rapidly growing population and a high reproduction rate, such as the DRC, future health policies on FP should focus on raising awareness among young women. The government should introduce new laws and strengthen existing laws on outreach and school-based counseling for girls by expanding the scope and capacity of the national reproductive health program and the school health program. This policy should focus on the use of male condoms, emergency contraception, and pills by girls as the main means of contraception. Furthermore, there should be an accelerated development, implementation, or strengthening of a program to promote sexual and reproductive health among women of reproductive age to achieve the sustainable development goals, including those related to sexual and reproductive health by 2030.

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8. APPENDIX

PMA Democratic Republic of Congo
Questionnaire

Did you check the Edit Saved forms menu for a linked female questionnaire?	◯ Yes ◯ No
Provide your signature to acknowledge that there is no linked female questionnaire.	
Close and exit this form without saving. Look for a linked female questionnaire through the 'Edit Saved Forms' Menu.	

Province:	
Kongo Central - District OR Kinshasa - Zone de Santé:	
Kongo Central - Aire de Santé OR Kinshasa - Quartier:	
Kongo Central - Village OR Kinshasa - Localité / rue:	
Enumeration Area:	
Structure number:	
Household number:	

001a. Are you in the correct household? EA: ${EA} Structure #: ${structure} Household #: ${household}	◯ Yes ◯ No

002. Your ID:	
Is this your ID?	◯ Yes ◯ No

002. Enter your ID below.

Please record your ID

003a. Current date and time.	Day: Month: Year:

Is this date and time correct?	◯ Yes ◯ No

003b. Record the correct date and time.	Day: Month: Year:

004a. The following info is from the household questionnaire. Please review to make sure you are interviewing the correct respondent.	
004a. The following info is what you provided previously. Please review.	

004b. Is the above information correct?	◯ Yes ◯ No
005. CHECK: You should be attempting to interview ${firstname}. Is that correct? *If misspelled, select "yes" and update the name in question "010." If this is the wrong person, you have two options: (1) exit and ignore changes to this form. Open the correct form. Or (2) find and interview the person whose name appears above.*	◯ Yes ◯ No
006. Is the respondent present and available to be interviewed today?	◯ Yes ◯ No
007. How well acquainted are you with the respondent?	◯ Very well acquainted ◯ Well acquainted ◯ Not well acquainted ◯ Not acquainted
INFORMED CONSENT *Find the woman between the ages of 15-49 associated with this Female Questionnaire. The interview must have auditory privacy. Administer the consent procedures.*	

Hello. My name is _____ and I am working for Kinshasa School of Public Health in collaboration with the Ministry of Health. We are conducting a local survey that asks women about various reproductive health issues. We would very much appreciate your participation in this survey. This information will help us inform the government to better plan health services. The survey usually takes between 15 and 20 minutes to complete. Whatever information you provide will be kept strictly confidential and will not be shown to anyone other than members of our survey team. Participation in this survey is voluntary, and if we should come to any question you don't want to answer, just let me know and I will go on to the next question; or you can stop the interview at any time. However, we hope that you will participate in this survey since your views are important. At this time, do you want to ask me anything about the survey?	
008a. Provide a paper copy of the Consent Form to the respondent and read it. Then, ask: May I begin the interview now?	◯ Yes ◯ No

008b. Respondent's signature *Please ask the respondent to sign or check the box in agreement of their participation.*	
Checkbox	◯

WARNING: The respondent has not signed or checked the box, despite agreeing to be interviewed. To conduct the survey, the respondent must sign or touch the checkbox. *You may go back to obtain a signature or check the box or you should go back to question H to indicate the respondent does not want to be interviewed.*	
009. Interviewer's ID: ${your_name} *Mark your ID as a witness to the consent process.*	○
009. Interviewer's ID Please record your ID as a witness to the consent process. You previously entered "${name_typed}."	
010. Respondent's first name. *You may correct the spelling here if it is not correct, but you must be interviewing the person whose name appears below.*	

Section 1 – Respondent's Background, Marital Status, Employment, and Migration

Now I would like to ask about your background and socioeconomic conditions.

101. In what month and year were you born? The age in the household roster is ${age}.	

Year:	Year:
102. How old were you at your last birthday?	
103. What is the highest level of school you attended? *Only record formal schooling. Do not record bible or koranic school or short courses.*	◯ Never attended ◯ Primary ◯ Secondary ◯ Tertiary ◯ No response
What is the religion of [name of household member]?	◯ No religion ◯ Catholic ◯ Protestant ◯Salvation Army ◯ Kimbangauist ◯ Other Christian ◯ Muslim ◯ Bundu dia Kongo ◯ Vuvamu ◯ Animist ◯ Eglises de réveil ◯ Other ◯ No response
104. Are you currently married or living together with a man as if married?	◯ Yes, currently married ◯ Yes, living with a man

Probe: If no, ask whether the respondent is divorced, separated, or widowed.	◯ Not currently in union: Divorced /separated ◯ Not currently in union: Widow ◯ No, never in union ◯ No response
Are there any other usual members of your household or persons who slept in the house last night? *Enter -99 for no response.*	

Section 2 – Reproduction, Pregnancy & Fertility Preferences	
201. Now I would like to ask about all the births you have had during your life. Have you ever given birth?	◯ Yes ◯ No ◯ No response
202. How many times have you given birth? *Enter -99 for no response.*	
203. how many children would you like to have in the future? *Enter -99 for no response.*	

Section 3 – Contraception *Now I would like to talk about family planning - the various ways or methods that a couple can use to delay or avoid a pregnancy.* *An image will appear on the screen for some methods. If the respondent says that she has not heard of the method or if she hesitates to answer, read the probe aloud and show her the image, if available.*	
301: Before you started using [current_recent_method], had you discussed the decision to delay or avoid pregnancy with your husband/partner?	◯ Yes ◯ No ◯ No response
CALC_CM. CALCULATE: CURRENT METHOD THIS WILL NOT APPEAR ON THE SCREEN *ODK will identify the most effective method currently being used by the respondent by selecting the highest method in the choice list.*	◯ Female sterilization ◯ Male sterilization ◯ Implant ◯ IUD ◯ Injectables ◯ Pill ◯ Emergency Contraception ◯ Male condom ◯ Female condom ◯ Diaphragm ◯ Foam/Jelly ◯ Standard Days/Cycle beads ◯ LAM ◯ Rhythm method ◯ Withdrawal ◯ Other traditional method ◯ No response