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Research Article

Factors Associated With the Use of Modern Contraceptive Methods among Married Women In The Kinshasa Health Zone, In The City-Province Of Kinshasa

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Abstract

Background: Family planning enables couples to make informed reproductive choices. In the Democratic Republic of the Congo (DRC), modern contraceptive use remains low. This study assessed factors associated with modern contraceptive method (MCM) use among married women in the Kinshasa Health Zone.

Methods: An analytical cross-sectional study was conducted from August to September 2024 among married women aged 18–49 years in the Kinshasa Health Zone. Of the 382 women initially targeted, 374 were included in the final analysis. Participants were selected using a three-stage probability sampling procedure. Data were collected through face-to-face interviews using KoboCollect and analyzed with SPSS version 25.0. Multivariable logistic regression was used to identify factors associated with MCM use.

Results: The prevalence of MCM use was 21.4%. Although 90.6% of participants demonstrated good knowledge of contraceptive methods, 64.7% reported concerns about side effects, and 41.2% reported using natural methods to prevent pregnancy. Factors significantly associated with MCM use included intention to use contraception (aOR = 11.50), taking precautions to avoid pregnancy (aOR = 9.24), good knowledge of MCMs (aOR = 5.41), recognition of contraceptive benefits (aOR = 3.12), and favorable perceptions of the importance of family planning (aOR = 2.85).

Conclusion: MCM use was associated with knowledge, perceptions, intentions, and pregnancy-prevention practices. Family-planning interventions could address concerns about side effects and improve access to reliable contraceptive information. However, the cross-sectional design precludes causal inference, and further research should examine service-related barriers and partner influence.

Keywords: Modern contraceptive methods, married women, use, associated factors, Kinshasa Health Zone.

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I. Introduction

Family planning (FP) is a cornerstone of socioeconomic development, enabling couples to decide when to have children and how many children they wish to have. It contributes to reducing maternal morbidity and mortality by preventing unintended pregnancies and pregnancies that occur too early, too late, too frequently, or too closely together, which may increase the risk of adverse maternal and perinatal outcomes, particularly in low-income settings [1]. Family planning also promotes reproductive autonomy and informed decision-making. Modern contraceptive methods (MCMs) help individuals and couples achieve their reproductive intentions, while condoms also provide protection against sexually transmitted infections, including HIV [3]. Despite progress in contraceptive use, access to and uptake of modern methods remain uneven across regions and population groups, particularly in sub-Saharan Africa [4–6].

In the Democratic Republic of the Congo (DRC), the total fertility rate declined from 6.6 children per woman in 2013–2014 to approximately 5.5 in 2023–2024 [8,9]. Nevertheless, modern contraceptive use among women currently married or in union remained limited, increasing from 8% in 2013–2014 to 11% in 2023–2024 at the national level [8,9]. Geographic disparities are also evident. The 2013–2014 Demographic and Health Survey (DHS) reported modern contraceptive use among 19% of women in union in Kinshasa, compared with 18% in the 2023–2024 DHS [8,9]. Unmet need for family planning also remains an important public health concern in the country [9]. Strengthening access to quality family-planning information and services therefore remains a public health priority.

The 2017–2018 Multiple Indicator Cluster Survey (MICS-Palu) reported a modern contraceptive prevalence of 33.8% among women currently married or in union in Kinshasa Province [7]. This estimate differs from that reported by the 2023–2024 DHS. Such differences should be interpreted cautiously, considering variations in survey periods, sampling procedures, measurement approaches, and other methodological characteristics. Furthermore, provincial estimates may not reflect contraceptive-use patterns within individual health zones.

Although these national and provincial surveys provide important contextual information, they do not specifically describe modern contraceptive use among married women in the Kinshasa Health Zone. Local evidence is therefore needed to document contraceptive practices and identify factors associated with method use in this population. This study aimed to assess the use of modern contraceptive methods and examine factors associated with their use among married women aged 18–49 years in the Kinshasa Health Zone.

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II. MATERIALS AND METHODS

2.1. Nature, framework and period of study

A cross-sectional analytical study was conducted from August to September 2024 in the Kinshasa Health Zone (HZ), Democratic Republic of Congo. The study took place within the health areas (AS) of this urban area.

2.2. Sampling

a) Study population

Married women (or women living in a marital relationship) aged 18 to 49 years residing in the Kinshasa health zone were included.

b) Sample size calculation

The minimum sample size was calculated using the standard formula for estimating a single population proportion: $n \geq Z_{\alpha}^2 \times P \times Q / d^2$ (10), where

- (n) is the minimum required sample size,
- (Z=1.96) corresponds to a 95% confidence level,
- (p=0.338) is the expected prevalence of modern contraceptive use among married women in the Democratic Republic of the Congo (DRC), as reported in reference [7],
- (q=1-p=0.662), and
- (d=0.05) represents the desired margin of error.

Substituting these values gives

$n = (1.96)^2 \times 0.338 \times 0.662 / (0.05)^2 = 343.8$, yielding a minimum sample size of 344 women. The expected prevalence of 33.8% was selected based on previously reported data on the modern contraceptive prevalence rate (mCPR) among married women in the DRC [7]. After adjusting for

an anticipated 10% non-response rate using the formula
(n_adjusted) =(n) / (1-r) = 344 /(1-0.10) =382.2 , the target sample size was approximately 382 women.
Of these, 374 were retained for the final analysis, corresponding to a response rate of 97.9% (374/382) and a non-response or exclusion rate of 2.1% (8/382).

c) Sampling techniques

A three-stage probability sampling method was used:
1. First stage: Selection of health areas. Four of the seven health areas in the health zone were selected by simple random sampling using a random-number generator.
2. Second stage: Selection of avenues. Five avenues were randomly selected from the administrative lists of each selected health area.
3. Third stage: Selection of households and eligible women. Households were selected systematically within each avenue. The household sampling interval was calculated by dividing the total number of households listed on each avenue by the number of women allocated to that avenue. A random starting household was selected within the first sampling interval, after which subsequent households were selected at regular intervals. When several eligible women resided in the same household, one was selected randomly.
4. Proportional allocation of the sample. The final sample of 374 women was distributed across the four selected health areas according to the demographic proportion of women of reproductive age in each area, as follows:

- Aketi: 90 women;
- Boyoma: 82 women;
- Mongala: 103 women;
- Pende: 99 women.

This proportional allocation ensured that each selected health area contributed to the overall sample according to its share of the population of women of reproductive age.

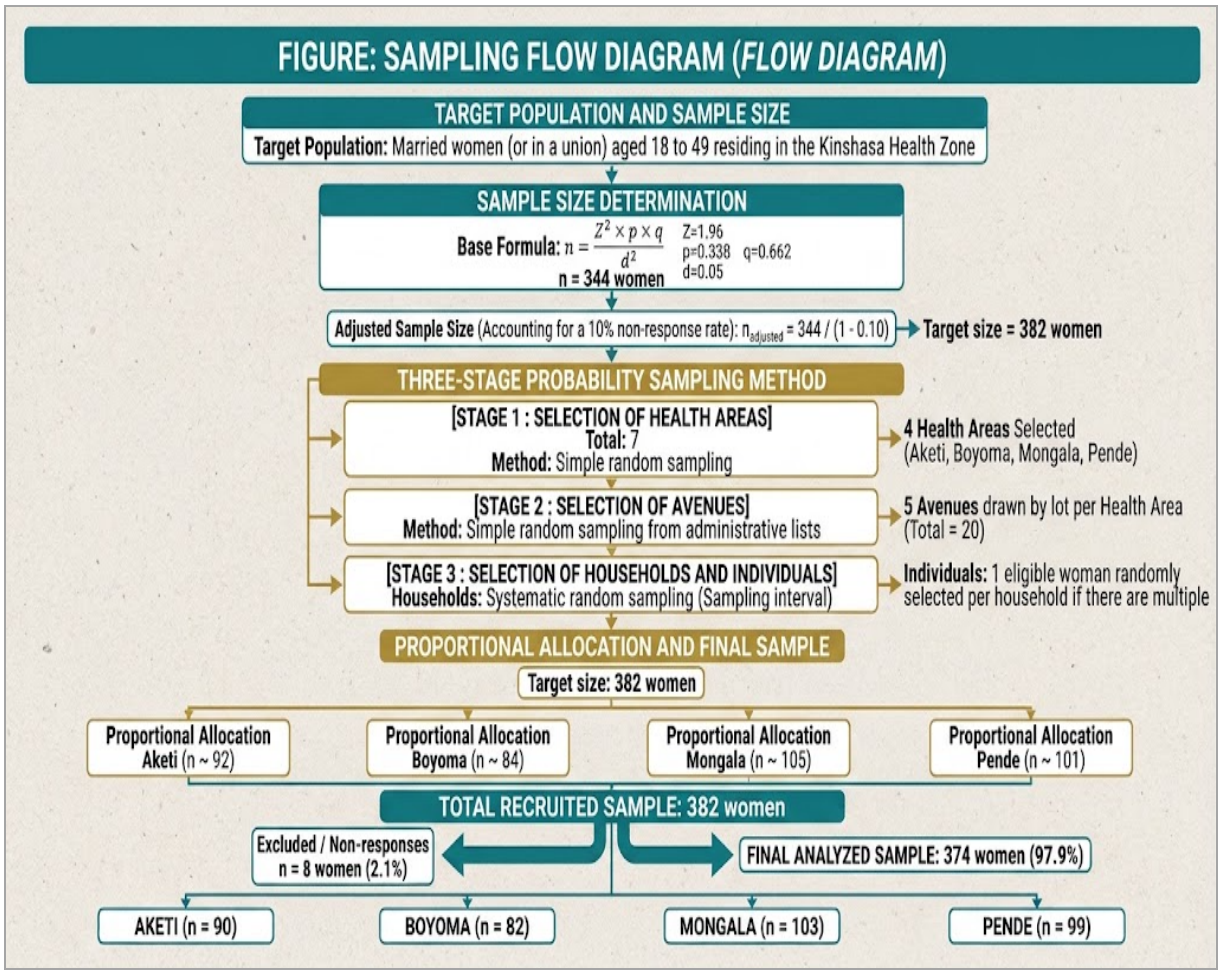

Figure 1. Sampling flow diagram

2.3. Variables of interest and operational definitions

The study variables were operationally defined as follows:

- Current use of modern contraceptive methods (dependent variable): Use of at least one modern contraceptive method during the three months preceding the survey, classified as yes or no. Methods included implants, injectables, oral contraceptive pills, condoms, intrauterine devices, diaphragms, and male or female sterilization.
- Age: Participants' age in completed years, categorized as 19–24, 25–34, and 35–49 years. For regression analysis, age was grouped as younger than 35 years and 35 years or older.
- Education level: Highest educational attainment, categorized as no formal or primary education, secondary education, or higher/university education.
- Occupation: Employment status, classified as unemployed (housewives or students) or employed in the public, private, or commercial sector.
- Religion: Religious affiliation, grouped into revival churches and other religious groups, including Catholic and Muslim.
- Parity: Whether the participant had children, recorded as yes or no.
- Inter-pregnancy interval: Time between pregnancies, categorized as less than 24 months, 24–36 months, or more than 36 months.
- Knowledge of modern contraceptive methods: Good knowledge was defined as citing at least three methods; low knowledge meant citing fewer than three.
- Perception of benefits: Recognition of health or birth-spacing benefits of contraception, classified as yes or no.
- Perception of disadvantages: Presence or absence of fears about side effects, particularly bleeding or infertility.
- Pregnancy-prevention practices: Use of natural methods to avoid pregnancy, recorded as yes or no.
- Intention to use: Reported intention to use a modern contraceptive method, classified as yes or no.
- Perceived importance of family planning: Opinion classified as favorable/important or unfavorable/useless

2.4. Data Collection

The data were collected through structured face-to-face interviews conducted in participants' homes. Interviewers used smartphones equipped with the KoboCollect v2024.1.3 application.

To ensure the clarity and validity of the research instrument, a pretest was systematically conducted with a group representing 5% of the sample size, selected from a health zone with similar characteristics but not included in the final study. This process allowed for adjustments to the wording of the questions and the stabilization of the variable dictionary. A daily consistency check was performed by the supervisory team to validate the completeness of the forms synchronized on the server.

2.5. Data Processing and Analysis

After data collection, the dataset was exported from KoboToolbox to Microsoft Excel for cleaning and consistency checks, then imported into SPSS version 25.0 for statistical analysis.

Descriptive statistics were expressed as frequencies and percentages. Pearson's chi-square test was used to assess associations between independent variables and current use of modern contraceptive methods (MCMs). Variables with a bivariate p-value <0.20 were considered for inclusion in the multivariable logistic regression model.

Binary logistic regression was performed to estimate crude and adjusted odds ratios (ORs), with their 95% confidence intervals (CIs) and p-values. Reference categories were specified for all categorical variables and assigned an OR of 1. Multicollinearity was assessed using the variance inflation factor (VIF), with values below 10 considered acceptable. Given the multistage sampling design, the analysis was reviewed to establish whether sampling weights and clustering at the health-area level had been accounted for.

Because sparse data and small cell counts could produce unstable estimates or separation, Firth's penalized likelihood logistic regression was considered where appropriate. Estimates obtained using this method were distinguished from those derived from conventional logistic regression. All tests were two-sided, and $p<0.05$ was considered statistically significant. The final findings were checked against the original statistical outputs to ensure consistency between variable coding, reference categories, ORs, 95% CIs, and p-values.

2.5. Ethical considerations

The study was approved by the Ethics Committee of the Kinshasa School of Public Health, University of Kinshasa (approval number: ESP/CE/221/2024). Informed consent was obtained from all participants before data collection. Consent was obtained in written or verbal form, as applicable, in accordance with the procedures authorized by the ethics committee. Confidentiality and anonymity were maintained throughout the study by using coded data collection forms and excluding personally identifying information from the analytical dataset.

III. RESULTS

1. Sociodemographic characteristics of married women:

The sample, with a mean age of 33.6 years, is predominantly composed of young women (55.6% are under 35) with a secondary education (73.0%) and no occupation (56.4%). Almost all participants are mothers (94.9%), with a strong influence from Pentecostal churches (67.9%). Finally, although 89.9% adhere to the recommended interpregnancy interval of at least 24 months, a significant proportion of 10.1% remain exposed to the risks of closely spaced pregnancies. (Table I)

Table I: Distribution of married women aged 18-49 according to their socio-demographic characteristics, Kinshasa health zone, August 2024 (n=374)

Sociodemographic characteristics	Frequency (n)	Percentage (%)
Age group (years)		
19 – 24	37	9.9
25 – 34	171	45.7
35 – 49	166	44.4
Mean ± Standard deviation	33.6 ± 6.8 years	
Education level		
No formal/primary education	4	1.1
Secondary	273	73.0
Higher /University education	97	25.9
Occupation		
Unemployed (Housewife/Student)	211	56.4
With a profession (Public/Private/Commerce sector)	163	43.6
Religion		
Revival churches	254	67.9
Others (Catholic, Muslim, etc.)	120	32.1
Parity (Do you have children?)		
Yes	355	94.9
No	19	5.1
Inter-pregnancy interval (n=286)		
< 24 months	29	10.1
24-36 months	135	47.2
> 36 months	122	42.7

2. **Knowledge, practice and perceptions regarding the use of MCMs :** The prevalence of modern contraceptive method use was 21.4%. Although 90.6% of women could cite at least three methods and 87.7% recognized the benefits of family planning, 64.7% reported

concerns about potential side effects, including bleeding or infertility. In addition, 41.2% reported using natural methods to prevent pregnancy, while 61.8% considered family planning important (Table II). These findings suggest that concerns about side effects may coexist with high contraceptive knowledge and relatively low use.

Table II: Distribution of married women aged 18 to 49 according to knowledge, practices, and perceptions regarding MCM use, Kinshasa Health Zone, August 2024 (n=374)

Variables	Frequency (n)	Percentage (%)
Current use of an MCM		
Yes	80	21.4
No	294	78.6
Knowledge of MCM		
Good (cites >= 3 methods)	339	90.6
Low (cites < 3 methods)	35	9.4
Methods cited (multiple responses, n=339)		
Implants / Injectables	177	52.2
Pills	74	21.8
Condoms	56	16.5
Other (IUD, Sterilization, etc.)	32	9.5
Perception of benefits		
Recognizes benefits (Spacing/Health)	328	87.7
Does not recognize any advantages	46	12.3
Perception of disadvantages		
Fear of side effects (Hemorrhage/Sterility)	242	64.7
No particular fears	132	35.3
Taking precautions (Natural methods)		
Yes	154	41.2
No	220	58.8
Perception of the importance of PF		
Favorable / Important	231	61.8
Unfavorable / Useless	143	38.2

3. Factors associated with current use of modern contraceptive methods

In the multivariable logistic regression analysis, five variables remained significantly associated with current use of modern contraceptive methods (MCMs). Intention to use MCMs showed the strongest association (aOR = 11.50; 95% CI: 5.02–26.40; $p < 0.001$), followed by taking precautions to avoid pregnancy (aOR = 9.24; 95% CI: 4.10–20.80; $p < 0.001$). Good knowledge of MCMs (aOR = 5.41; 95% CI: 1.12–26.30; $p = 0.036$), recognition of contraceptive benefits (aOR = 3.12; 95% CI: 1.04–9.40; $p = 0.042$), and favorable perceptions of family planning importance (aOR = 2.85; 95% CI: 1.15–7.04; $p = 0.023$) were also significantly associated with current use. Age ($p = 0.248$) and education level ($p = 0.528$) were not significantly associated after adjustment. These findings highlight associations between contraceptive knowledge, perceptions, intentions, and current MCM use, without establishing causal relationships (Table III).

Table III. Bivariate and multivariable logistic regression analysis of factors associated with modern contraceptive method use among married women, Kinshasa Health Zone, August 2024 (n = 374)

Variables	MCM users, n (%)	Non-users, n (%)	Crude OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Age group (years)						
<35	53 (14.2)	155 (41.4)	1.76 (1.05–2.95)	0.031	1.42 (0.78–2.58)	0.248
≥35	27 (7.2)	139 (37.2)	1		1	
Education level						
No formal/primary education	52 (13.9)	225 (60.2)	0.57 (0.33–0.97)	0.037	0.81 (0.42–1.56)	0.528
Secondary/higher education	28 (7.5)	69 (18.4)	1		1	
Knowledge of MCMs						

Good	79 (21.1)	260 (69.5)	10.20 (1.37–75.70)	0.005	5.41 (1.12–26.30)	**0.036**
Low	1 (0.3)	34 (9.1)	1		1	
Perceived benefits of MCMs						
Recognizes benefits	78 (20.9)	250 (66.8)	6.86 (1.62–28.90)	0.003	3.12 (1.04–9.40)	**0.042**
Does not recognize benefits	2 (0.5)	44 (11.8)	1		1	
Precautions taken to avoid pregnancy						
Yes	71 (19.0)	83 (22.2)	20.05 (9.58–41.90)	<0.001	9.24 (4.10–20.80)	**<0.001**
No	9 (2.4)	211 (56.4)	1		1	
Intention to use MCMs						
Yes	71 (19.0)	66 (17.6)	27.25 (12.90–57.40)	<0.001	11.50 (5.02–26.40)	**<0.001**
No	9 (2.4)	228 (61.0)	1		1	
Perceived importance of family planning						
Favorable/important	72 (19.3)	159 (42.5)	7.64 (3.55–16.40)	<0.001	2.85 (1.15–7.04)	**0.023**
Unfavorable/useless	8 (2.1)	135 (36.1)	1		1	

Abbreviations: MCM, modern contraceptive method; OR, odds ratio; CI, confidence interval; Ref., reference category = OR of 1.00

IV. Discussion

The findings of this study indicate that the prevalence of modern contraceptive method (MCM) use among married women in the Kinshasa Health Zone was 21.4%. Although 90.6% of participants demonstrated good knowledge of MCMs, contraceptive use remained relatively low. Concerns about potential side effects, particularly bleeding and infertility, were reported by 64.7% of women, while 41.2% reported taking precautions to avoid pregnancy through natural methods. In the multivariable analysis, intention to use MCMs showed the strongest association with current use (aOR = 11.50; 95% CI: 5.02–26.40), followed by taking precautions to avoid pregnancy (aOR = 9.24; 95% CI: 4.10–20.80). Good knowledge of MCMs (aOR = 5.41), recognition of their benefits (aOR = 3.12), and favorable perceptions of the importance of family planning (aOR = 2.85) were also significantly associated with current use. In contrast, age and education level were not significantly associated after adjustment. These findings highlight the importance of examining contraceptive knowledge, perceptions, and intentions when interpreting MCM use in this population, without implying causal relationships

4.1. Prevalence of modern contraceptive method use

The prevalence of modern contraceptive method (MCM) use among married women aged 18–49 years in the Kinshasa Health Zone was 21.4%. This finding differs from estimates reported for broader populations. The 2017–2018 Multiple Indicator Cluster Survey (MICS) reported a prevalence estimate of 7.4% for Kinshasa Province [7], while the 2023–2024 Demographic and Health Survey reported modern contraceptive use among 11% of women in union nationally [9]. These estimates do not specifically describe married women in the Kinshasa Health Zone. Differences in geographical coverage, target populations, survey periods, sampling methods, and operational definitions may affect comparability.

The prevalence observed in this study was lower than the 29.0% reported by Katoka Fuanda in the Gombe Matadi Health Zone [10], the 34.1% reported by Kamissoko in Mali [11], and the 30.6% reported in the Vanga Health Zone by Izale et al. [12]. However, these estimates should be compared cautiously because the studies may differ in their populations and definitions of contraceptive use. Moreover, because no formal statistical comparisons were conducted, the

observed differences should not be described as statistically significant.

In the present study, MCM use was assessed among married women aged 18–49 years based on reported use during the three months preceding the survey. This operational definition may differ from those used in MICS and other studies, particularly those assessing contraceptive use at the time of the survey. In addition, 64.7% of participants reported concerns about contraceptive side effects, while 41.2% reported using natural methods to prevent pregnancy. These findings provide context for understanding contraceptive practices but do not establish explanations for the observed prevalence. Further studies using standardized definitions and comparable populations are needed to clarify these differences.

4.2. Knowledge, attitudes and perceptions

The study found that 90.6% of participants had good knowledge of modern contraceptive methods (MCMs), defined as the ability to cite at least three methods. Among these 339 women, implants and injectables were reported together by 177 participants (52.2%), followed by pills (21.8%), condoms (16.5%), and other methods, including intrauterine devices and sterilization (9.5%). These findings indicate widespread knowledge of MCMs, particularly the combined category of implants and injectables. However, their individual frequencies cannot be determined from the available data. Comparisons with studies conducted by Tigabu et al. in Ethiopia [14], Panda et al. in India [15], and Leghari et al. in Pakistan [16] should consider differences in the classification of methods and the denominators used.

Regarding perceptions, 87.7% of participants recognized the benefits of family planning, particularly for birth spacing and health. Nevertheless, 64.7% expressed concerns about potential side effects, especially bleeding and infertility. Concerns and misconceptions about contraceptive methods have also been examined by Gebremariam and Addissie in Ethiopia [17] and in studies of contraceptive use in Côte d'Ivoire [20,21] and Kinshasa [20]. However, differences in study populations and the specific perceptions assessed should be considered when comparing these findings.

Regarding reported practices, 41.2% of participants indicated using natural methods to prevent pregnancy, while 58.8% did not. Furthermore, 61.8% considered family planning important, whereas 38.2% held unfavorable perceptions or considered it useless. Overall, these results highlight the coexistence of widespread contraceptive knowledge, recognition of family planning benefits, persistent concerns about side effects, and diverse perceptions and practices among married women in the Kinshasa Health Zone.

4.3. Factors associated with current use of modern contraceptive methods

The findings suggest that modern contraceptive method (MCM) use was associated with women's reproductive intentions, pregnancy-prevention practices, contraceptive knowledge, and perceptions of family planning. Intention to use contraception may reflect a desire to space births and make informed reproductive choices. However, this association should be considered alongside the possibility that existing contraceptive practices may influence women's stated intentions. Similarly, the association with taking precautions to prevent pregnancy may reflect engagement in pregnancy-prevention behaviors, although conceptual overlap with contraceptive use may partly explain this finding.

Knowledge of MCMs and recognition of their benefits may support informed decision-making by improving women's understanding of available methods and their potential advantages. Favorable perceptions of family planning may also reflect greater acceptance of birth spacing and reproductive health services. Nevertheless, knowledge and positive perceptions do not necessarily translate into contraceptive use, particularly when concerns about side effects, misinformation, partner influence, or difficulties accessing services persist. These findings can be discussed alongside research on contraceptive knowledge, practices, and associated factors in Rwanda [21], the Democratic Republic of the Congo [22], and

Burkina Faso [23], as well as national estimates from the 2023–2024 DRC Demographic and Health Survey [9]. Differences in study populations, variable definitions, and methodologies should nevertheless be considered.

Unlike findings from studies examining contraceptive use among women in Kinshasa [25], young female students in Guinea [26], and tribal married women in India [15], age and education were not significantly associated with contraceptive use after adjustment in the present study. These differences may reflect variations in social context, population characteristics, access to information, and health-service availability. The absence of statistically significant associations does not, however, establish that sociodemographic inequalities are irrelevant. Overall, these findings identify factors associated with MCM use but do not establish causal relationships; residual confounding and the possibility of reverse causation should also be considered.

4.4. Strengths and limitations of the study

A major strength of this study is the use of KoboCollect for electronic data collection, which helped reduce data-entry errors. Multivariable logistic regression was used to examine factors associated with modern contraceptive method use. However, several limitations should be acknowledged. The cross-sectional design prevents establishing temporal relationships or causal inferences. Self-reported information may be affected by recall and social-desirability biases, while residual confounding may have influenced the observed associations. The exclusion of eight participants may also have introduced selection bias if they differed systematically from those included. Furthermore, the study did not assess supply-side factors, such as contraceptive stockouts, service costs, or quality of care, nor partner influence and couple dynamics. These omissions limit the interpretation of barriers to contraceptive use. Finally, because the study was conducted in selected health areas, generalizability beyond these areas, particularly to rural populations or other settings in the Democratic Republic of the Congo, should be approached cautiously. The findings are most directly applicable to the study population and context.

Conclusion

Modern contraceptive method use was 21.4% among married women in the Kinshasa Health Zone, despite widespread contraceptive knowledge. Use was associated with intention to use contraception, pregnancy-prevention practices, knowledge, perceived benefits, and favorable perceptions of family planning. Family-planning programs could strengthen counseling on side effects and provide reliable contraceptive information. Further research should explore partner influence and service-related barriers to inform locally appropriate interventions.

What is known about this subject

Several factors associated with the use of MCMs are discussed in the literature, including:

- Education level,
- Knowledge about the different contraceptive methods,
- The perception of the importance of using MCMs in a couple…

What this study adds

Three other factors were identified during this study conducted in the Kinshasa health zone:

- Knowledge of the advantages of using MCMs,
- Taking steps to avoid pregnancy
- Intention to use MCMs in the future.

These findings may help reproductive health services develop strategies to support informed contraceptive choices among married women in this health zone.

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Data availability

The data analysed during this study are available from the corresponding author upon reasonable request.

Author contributions

BM designed the study, conducted data collection, analyzed the data, and drafted the first version of the manuscript. TM participated in the study design and data analysis and reviewed the manuscript. All authors read and approved the final version of the manuscript.

Conflicts of interest:

The authors declare no conflict of interest.

Consent to participate

Ethical approval was granted by the Ethics Committee of the Kinshasa School of Public Health, University of Kinshasa (ESP/CE/221/2024). Informed consent to participate was obtained from all participants before data collection.

AI Use Statement

The authors declare that generative artificial intelligence tools were not used in the conception, design, data analysis, or interpretation of this study. Any AI-assisted tools used were limited to minor language editing and grammar correction. The authors take full responsibility for the scientific content and accuracy of the manuscript.

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