ANS-LHS

OPEN ACCESS

Advanced Natural Sciences: Life and Health Sciences,
ISSN: 3107-636X, Vol-3, Issue-2,
July-Dec, 2026, 296-311
https://www.indjournals.com

Research Article

Factors Associated with Modern Contraceptive Method Utilization Among Women of Reproductive Age (15–49 Years) in the Djombo Health Zone, Democratic Republic of the Congo

Mokolo Ano-bilombe Tom[1] , Lievin Tshimanga[1]

and Mambu Therèse[2]

[1]MD, MPH,School of Public Health, University of Kinshasa, Democratic Republic of Congo.
[2]MD, MPH, PhD, School of Public Health, University of Kinshasa, Democratic Republic of Congo.

Article Info:

Corresponding author:
Mokolo Ano-bilombe Tom, MD, MPH,School of Public Health, University of Kinshasa, Democratic Republic of Congo.
tommokolo@gmail.com

DOI:10.68819/anslhs.2026.0036

[Received 01-09-2026,
Accepted 03-10-2026,
Published 07-11-2026]

Publishers Note: Natural Science Association stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Copyright: ©2026 by the author(s). This is an Open Access article distributed under the terms of the Creative Commons Attribution 4.0 license (unless stated otherwise) permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.
https://creativecommons.org/licenses/by/4.0//

Abstract

Introduction: Modern contraceptive method (MCM) utilization remains a public health concern in rural areas of the Democratic Republic of the Congo. This study assessed MCM utilization and associated factors among women aged 15–49 years in the Djombo Health Zone.

Methods: A cross-sectional analytical study was conducted in September 2025 among 432 women selected through a three-stage sampling procedure. Data were collected using an electronic questionnaire and analyzed with SPSS version 25.0. Chi-square tests and logistic regression were used to assess associations.

Results: Among 432 participants, 141 used modern contraceptive methods, yielding a prevalence of 32.6%. Multivariable analysis showed that secondary or higher education (aOR = 2.46; 95% CI: 1.69–3.59; $p < 0.001$), living in a marital union (aOR = 1.70; 95% CI: 1.07–2.69; $p = 0.024$), and an inter-pregnancy interval of at least three years (aOR = 2.58; 95% CI: 1.08–6.16; $p = 0.032$) were associated with higher odds of utilization. Partner approval was positively associated with utilization (aOR = 3.61; 95% CI: 2.28–5.72; $p < 0.001$), whereas not knowing the partner's opinion was associated with lower odds (aOR = 0.21; 95% CI: 0.10–0.42; $p < 0.001$). Lack of religious affiliation was associated with higher odds than Christian affiliation (aOR = 2.10; 95% CI: 1.20–3.68; $p = 0.009$). Living at least 5 km from a health facility was associated with lower odds (aOR = 0.48; 95% CI: 0.30–0.76; $p = 0.002$).

Conclusion: MCM utilization was 32.6%. Improving contraceptive information, partner communication, and geographical access may help address barriers to use while safeguarding women's reproductive autonomy

Keywords: Family planning, Modern contraceptive methods, Djombo health zone, Spousal approval, Geographical accessibility, DRC, Reproductive health

\

I. Introduction

Reproductive health remains a major public health priority, particularly in low- and middle-income countries, where access to and utilization of modern contraceptive methods remain uneven. Family planning contributes to reducing unintended pregnancies, improving maternal and child health, and supporting household well-being and socioeconomic development. Accordingly, national and

Cite this article: Mokolo Ano-bilombe Tom, Lievin Tshimanga and Mambu Therèse, 2026. Factors Associated with Modern Contraceptive Method Utilization Among Women of Reproductive Age (15–49 Years) in the Djombo Health Zone, Democratic Republic of the Congo. Advanced Natural Sciences: Life and Health Sciences, 3(2). 296-311. 10.68819/anslhs.2026.0036

international policies emphasize the importance of expanding access to voluntary, safe, and effective contraceptive services (1–3). Nevertheless, despite ongoing interventions by governments and development partners, contraceptive utilization remains inadequate in several communities, highlighting persistent inequalities in access to and use of reproductive health services (1–3). In the Democratic Republic of the Congo (DRC), modern contraceptive use remains an important public health concern. Existing research and national estimates have documented disparities in contraceptive utilization according to women's educational attainment, socioeconomic circumstances, marital status, reproductive intentions, and geographical access to health services. Previous studies have also identified informational barriers, gender-related power imbalances, social and religious norms, and concerns surrounding contraceptive methods as potential obstacles to their adoption (4–7). However, national and provincial estimates cannot fully explain the circumstances shaping contraceptive practices within individual rural health zones, where service availability, community perceptions, household decision-making, and geographical constraints may differ considerably. In the Djombo Health Zone, locally specific evidence is needed to establish the level of modern contraceptive use among women aged 15–49 years and to better understand the factors associated with its utilization. In particular, the relative contributions of partner approval, educational attainment, marital status, pregnancy-spacing patterns, religious affiliation, occupation, and distance to health facilities require investigation in this setting. Understanding these factors is important because findings from national or provincial studies may not fully reflect the social, cultural, and geographical circumstances influencing contraceptive practices in this rural community.

Addressing the limited availability of local evidence is essential for supporting evidence-based decision-making and improving the ✓ delivery of family planning services in the Djombo Health Zone. Identifying the factors associated with modern contraceptive utilization may help local health authorities and healthcare providers better understand women's needs and develop interventions adapted to the local context. Such interventions could include strengthening contraceptive counselling, improving community awareness, encouraging open communication between partners, and reducing geographical barriers to accessing reproductive health services, while ensuring informed choice and respect for women's reproductive autonomy (8–10). The findings may therefore provide a useful evidence base for adapting local family planning strategies, optimizing available resources, and improving the responsiveness of reproductive health services to the needs of women of reproductive age. Specifically, this study aimed to determine the factors associated with modern contraceptive method utilization among women of reproductive age (15–49 years) in the Djombo Health Zone, Democratic Republic of the Congo.

II. METHODS

1. Study framework

The survey was conducted within the Djombo health zone, located in the Basankusu territory of the Equateur province. This health zone spans an area of 5,538 square kilometers and serves a total population of 118,402 inhabitants, representing a population density of 21 inhabitants per square kilometer. Structurally, the zone is divided into 14 health areas and supported by 226 community animation cells. The target population, comprising women of reproductive age (15 to 49 years), is estimated at 24,864 individuals.

2. Type of study

We conducted a cross-sectional analytical study. Data collection was carried out at a single point in time, from September 14 to 19, 2025, directly within households across the Djombo health zone.

3. Sampling Method

Study Population: The study population comprised women of reproductive age residing

in 40 villages distributed across the 14 health areas of the Djombo Health Zone, Democratic Republic of the Congo.

✓ **Sample Size**

The sample size was calculated using Schwartz's formula, assuming a 95% confidence level (Z=1.96), an estimated proportion of 15% (p=0.15), a margin of error of 5% (d=0.05), and a design effect of 2. The initial sample size was 392 participants. After allowing for a potential non-response rate of 10%, the final target sample size was set at 432 women.

✓ **Sampling Techniques**

A three-stage stratified cluster sampling technique was employed:

- First stage: Seven of the 14 health areas were randomly selected.
- Second stage: Villages within the selected health areas were identified using the available sampling frame. The sample was allocated proportionally to the population size of each selected health area and village.
- Third stage: Households were selected using the central-point method. Starting from a central intersection or prominent landmark, the interviewer spun a pen and followed the direction indicated by its cap to identify the first household. Subsequent households were visited consecutively using a door-to-door approach until the allocated sample was reached. If no eligible woman was present in a household, the interviewer proceeded to the immediately neighboring household.

The analysis should account for the sampling design, including stratification and clustering, where appropriate. Sampling weights should also be considered if selection probabilities differed across the sampled units.

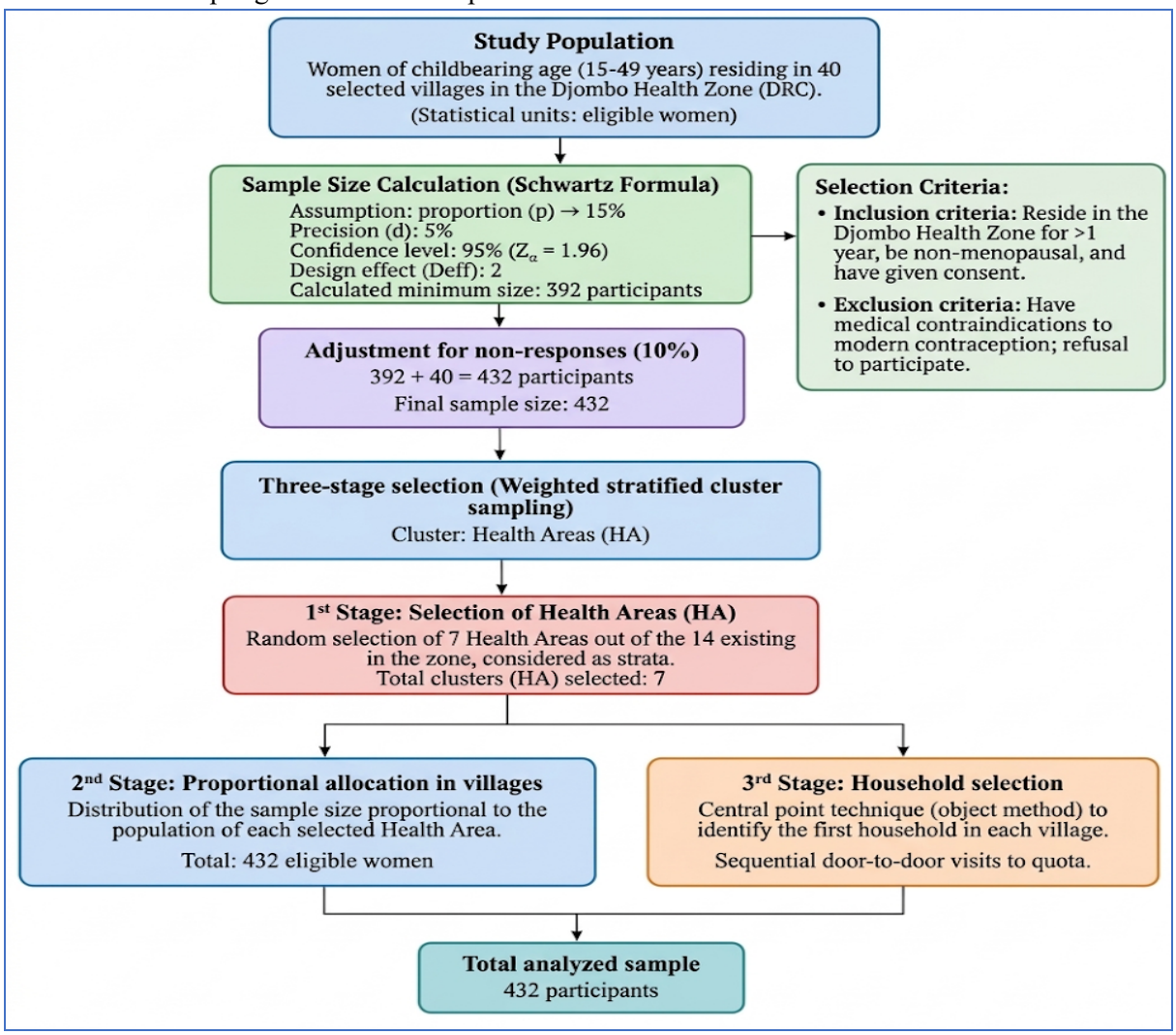


Figure1. Sampling Flow Diagram

Study Variables

The primary dependent variable was the current utilization of modern contraceptive methods (MCMs), defined as the continuous use of at least one modern contraceptive method at the time of the survey (measured as a binary variable: yes or no).

Independent variables were categorized across several domains:

- ✓ **Sociodemographic characteristics:** Age in completed years, educational level (none, primary, secondary, higher), marital status (single, married, cohabiting/free union, divorced, widowed), occupation (farmer, trader/vendor, employee, student, unemployed), monthly income, and religious affiliation (Catholic, Protestant, Revivalist, Kimbanguist, Muslim, or no religion).
- ✓ **Knowledge and attitudes:** Current contraceptive status, self-reported primary reason for non-use (informational deficit, high cost, limited physical access, cultural or religious preferences, side effects, partner opposition, and other reasons), and perceived spousal/partner approval of contraceptive use.
- ✓ **Sociocultural factors:** Partner opposition, perceived influence of religious beliefs on contraceptive use, and fear of community stigma.
- ✓ **Access to health services:** Geographic distance from the household to the nearest health facility providing contraceptive services (<1 km, 1-5 km, 5-10 km, and >10 km), and availability of contraceptive methods (defined as the presence of at least three modern contraceptive options at the facility).
- ✓ **Autonomy and decision-making:** Primary decision-maker regarding contraceptive use within the household (woman alone, partner alone, joint decision, family member, or third party).

For multivariable logistic regression, only variables associated with MCM utilization at a significance level of $p < 0.20$ in the chi-square test were retained and recoded to ensure analytical relevance and adequate cell sizes. Educational level was regrouped into no/low education (none and primary education) and educated (secondary and higher education); marital status into in union and not in union; occupation into occupied and unemployed; religious affiliation into Christian, non-Christian, and no religion; inter-pregnancy interval into <3 years and ≥3 years; and distance to the nearest health facility into <5 km and ≥5 km. Spousal/partner approval was retained in its original three-category form (yes, no, and does not know). Variables meeting the $p < 0.20$ criterion were subsequently entered into the multivariable logistic regression model to estimate adjusted odds ratios (AORs) with their corresponding 95% confidence intervals. Statistical significance was established at $p < 0.05$.

Data Collection

Data were gathered using a mobile electronic data collection application, KoboCollect (version v2024.2.4). Information was collected through structured face-to-face interviews lasting approximately 20 minutes, using a standardized questionnaire administered to one eligible woman per household.

Prior to field deployment, the protocol underwent a rigorous preparatory phase, including obtaining ethical and administrative approvals, conducting comprehensive training for data collectors, and pre-testing the survey instrument. Data collection was monitored continuously by the research supervisory team. At the end of each day, completed forms were centralized at the Djombo health zone headquarters for quality control and verification prior to final synchronization.

Data Processing and Analysis

All data captured through KoboCollect were exported to an Excel spreadsheet for thorough cleaning to correct inconsistencies. Statistical analysis was performed using SPSS version 25.0.

Univariate analysis was conducted to summarize categorical variables as frequencies and

percentages, while continuous variables were described using measures of central tendency and dispersion (means and standard deviations). In bivariate analysis, associations between categorical variables were assessed using Pearson's Chi-square test, with statistical significance established at $p < 0.05$. Finally, multivariate logistic regression was performed to identify independent determinants of modern contraceptive use, reporting adjusted odds ratios (OR) with 95% confidence intervals.

Ethical Aspects

Ethical approval for this study was granted by the Ethics Committee of the School of Public Health at the University of Kinshasa (Approval No. ESP/CE/102B/2025). Administrative authorization was obtained from the relevant provincial and health zone authorities. Informed consent was obtained from all participants before data collection. Written informed consent was obtained from literate participants, whereas verbal informed consent was obtained from participants who could neither read nor write, in accordance with the approved ethical procedures. Participation was voluntary, and participants were informed of their right to withdraw at any time without penalty. Confidentiality and anonymity were ensured through numerical identification codes, and the results were reported in aggregate form.

III. RESULTS

The baseline characteristics of the respondents were analyzed across the full sample. A total of 432 women of reproductive age (15 to 49 years) were included in this study.

1. Sociodemographic characteristics of women of reproductive age in Djombo Health Zone

The studied population is predominantly young, with 56% of women aged 21–30 years, representing the period of peak fertility. Educational attainment remains low, with 41% having completed primary education and 18% receiving no formal schooling. Regarding marital status, the majority (71%) live in a union (either married or cohabiting). Occupationally, the profile reflects a rural setting, as more than half of the women (57%) are engaged in agriculture. Revivalist Churches predominate (47%), and 99% of women have at least one child, highlighting high fertility and a substantial need for family planning services (Table 1).

Table I. Sociodemographic characteristics of respondents on MCM, Djombo Health Zone, 2025 (N = 432)

Variable / Modality	**n = 432**	**%**
Age of the woman		
15–20 years	30	7.0
21–25 years	121	28.0
26–30 years	121	28.0
31–35 years	95	22.0
36 years and older	65	15.0
Educational level		
Primary	177	41.0
Secondary	173	40.0
None	78	18.0
Higher	4	1.0
Marital status		
Cohabiting / Free union	181	42.0
Married	125	29.0
Single	95	22.0
Divorced	22	5.0
Widowed	9	2.0

Primary occupation		
Farmer	246	57.0
Unemployed	99	23.0
Trader / Vendor	56	13.0
Employee	26	6.0
Student	4	1.0
Others	0	0.0
Religious beliefs		
Revivalist Churches	203	47.0
Catholic	86	20.0
Protestant	69	16.0
No religion	60	14.0
Kimbanguist	9	2.0
Muslim	5	1.0
Number of children		
None	0	0.0
1–5 children	324	75.0
5–9 children	104	24.0
10 children and more	4	1.0

2. Proportion of women of reproductive age utilizing Modern Contraceptive Methods (MCM)

Only 32.6% of women currently use modern contraceptive methods, compared to 67.4% who do not. This low proportion reflects a limited contraceptive prevalence rate in the Djombo Health Zone, underscoring the urgent need to strengthen community awareness campaigns and improve physical access to reproductive health services (Table 2)

Table II. Proportion of women of reproductive age using MCM, Djombo Health Zone, 2025

Modern Contraceptive Use	n = 432	%
Non-users	291	67.4
Users	141	32.6

3. Level of knowledge regarding Modern Contraceptive Methods

While 50.7% of women demonstrate good knowledge of modern contraceptive methods, only 32.6% actually practice modern contraception. Despite this awareness, the perceived risk associated with non-use remains moderate (37.4%), highlighting a significant gap between theoretical knowledge and actual contraceptive practice (Table 3).

Table III. Level of knowledge regarding MCM among respondents, Djombo Health Zone, 2025

Knowledge and Perception Indicator	**n = 432**	**%**
Knowledge of MCM		
Good level of knowledge	219	50.7
Poor level of knowledge	213	49.3
Perceived risk of non-use		
Perceived risk (High/Moderate)	162	37.4
No perceived risk	270	62.6

4. Knowledge, attitudes, and access parameters regarding MCM among women aged 15–49 years

Knowledge, attitudes, and practice indicators associated with MCM among 432 women show a contrasting profile (95% confidence intervals calculated using Wilson's method). Perceived difficulty in obtaining contraceptives (66.0%) and low spousal approval (40.2%) represent major structural and interpersonal barriers. Conversely, risk perception (62.6%) and healthcare worker counseling (60.7%) serve as positive levers. Overall, the findings suggest that structural barriers outweigh behavioral willingness, justifying an integrated strategy focusing on access and male involvement (Table 4).

Table IV. MCM knowledge, attitudes, and access indicators among women aged 15–49 years, Djombo Health Zone, 2025

Variable	n (N = 432)	%	95% CI
Good level of MCM knowledge	219	50.7	[46.0–55.4]
Duration of use >= 1 year	258	59.8	[55.1–64.3]
Spousal / Partner approval (Yes)	174	40.2	[35.7–44.9]
Easy access to MCM (Adolescents)	218	50.5	[45.8–55.2]
Healthcare provider counseling received	262	60.7	[56.0–65.2]
Perceived difficulty in obtaining MCM	285	66.0	[61.4–70.3]
Perceived risk of non-utilization	270	62.6	[57.9–67.0]

5. MCM utilization according to sociodemographic and contextual characteristics

Cross-tabulating MCM utilization with eight sociodemographic and contextual covariates reveals notable differentials. Three main variables show wide disparities: spousal approval (65.0% among approved vs. 33.3% among non-approved), educational level (increasing from 20.5% among uneducated women to 43.9% among those with secondary education), and marital status (44.8% among married women vs. 21.1% among single women). Age, religion, and distance display non-monotonic relationships (Table 5)

Table V. MCM utilization according to sociodemographic characteristics among women of reproductive age, Djombo Health Zone, 2025

Characteristic	MCM Use Yes n (%)	MCM Use No n (%)	Total
Age			
15–20 years	5 (16.7)	25 (83.3)	30
21–25 years (ref.)	45 (37.2)	76 (62.8)	121
26–30 years	37 (30.6)	84 (69.4)	121
31–35 years	31 (32.6)	64 (67.4)	95
36 years and older	21 (32.3)	44 (67.7)	65
Educational level			
None (ref.)	16 (20.5)	62 (79.5)	78
Primary	48 (27.1)	129 (72.9)	177
Secondary	76 (43.9)	97 (56.1)	173
Higher	4 (100.0)	0 (0.0)	4
Marital status			
Cohabiting / Free union (ref.)	53 (29.3)	128 (70.7)	181
Married	56 (44.8)	69 (55.2)	125
Single	20 (21.1)	75 (78.9)	95
Divorced	8 (36.4)	14 (63.6)	22
Widowed	3 (33.3)	6 (66.7)	9

Primary occupation			
Farmer (ref.)	67 (27.2)	179 (72.8)	246
Trader / Vendor	29 (51.8)	27 (48.2)	56
Employee	12 (46.2)	14 (53.8)	26
Student	4 (80.0)	1 (20.0)	5
Unemployed	30 (30.3)	69 (69.7)	99
Religious belief			
Catholic (ref.)	32 (37.2)	54 (62.8)	86
Protestant	13 (18.8)	56 (81.2)	69
Revivalist Churches	66 (32.5)	137 (67.5)	203
Kimbanguist	2 (22.2)	7 (77.8)	9
Muslim	2 (40.0)	3 (60.0)	5
No religion	29 (48.3)	31 (51.7)	60
Inter-pregnancy interval (child age gap)			
1 year (ref.)	60 (24.3)	187 (75.7)	247
2 years	67 (44.4)	84 (55.6)	151
3 years and more	12 (54.5)	10 (45.5)	22
None	3 (25.0)	9 (75.0)	12
Spousal / Partner approval			
Yes	112 (64.4)	62 (35.6)	174
No (ref.)	47 (33.3)	94 (66.7)	141
Does not know	11 (3.8)	106 (96.2)	117
Distance to nearest health center			
< 1 km	57 (44.9)	70 (55.1)	127
1–5 km (ref.)	54 (33.3)	108 (66.7)	162
5–10 km	8 (16.3)	41 (83.7)	49
> 10 km	25 (26.6)	69 (73.4)	94

6. Factors associated with MCM utilization among women of reproductive age

The multivariate logistic regression analysis identified several factors significantly associated with modern contraceptive method (MCM) utilization. Women with secondary or higher education were more likely to use MCMs than those with no or low education (OR = 2.46; 95% CI: 1.69-3.59; $p < 0.001$). Women living in a marital union also had significantly higher odds of MCM utilization compared with those not in union (OR = 1.70; 95% CI: 1.07-2.69; $p = 0.024$). Similarly, respondents with an inter-pregnancy interval of at least three years were more likely to use MCMs than those with shorter intervals (OR = 2.58; 95% CI: 1.08-6.16; $p = 0.032$). Spousal/partner approval emerged as one of the strongest determinants of contraceptive use, with approved women being 3.61 times more likely to use MCMs than those whose partners did not approve (OR = 3.61; 95% CI: 2.28-5.72; $p < 0.001$), whereas women who were unaware of their partner's opinion were significantly less likely to use MCMs (OR = 0.21; 95% CI: 0.10-0.42; $p < 0.001$). Moreover, women reporting no religious affiliation had greater odds of MCM utilization than Christian women (OR = 2.10; 95% CI: 1.20-3.68; $p = 0.009$). Conversely, residing at least 5 km from the nearest health facility significantly reduced the likelihood of MCM utilization (OR = 0.48; 95% CI: 0.30-0.76; $p = 0.002$) (Table 6)

Table VI. Multivariate Logistic Regression Analysis of Factors Associated with Modern Contraceptive Method (MCM) Utilization among Women of Reproductive Age, Djombo Health Zone, 2025

Variables and Categories	MCM Use Yes n (%)	MCM Use No n (%)	Crude OR (95% CI)	p-value
Educational level				
No education	64 (44.4)	191 (66.3)	1	
Educated	80 (55.6)	97 (33.7)	2.46 (1.69-3.59)	<0.001
Marital status				
Not in union	31 (22.1)	95 (32.7)	1	
In union	109 (77.9)	197 (67.3)	1.70 (1.07-2.69)	0.024
Main				
Unemployed	30 (21.1)	69 (23.8)	1	
Employed/Occupied	112 (78.9)	221 (76.2)	1.17 (0.72-1.91)	0.516
Religion				
Christian	113 (78.5)	254 (88.2)	1	
Non-Christian	2 (1.4)	3 (1.0)	1.50 (0.25-9.05)	0.659
No religion	29 (20.1)	31 (10.8)	2.10 (1.20-3.68)	0.009
Inter-pregnancy interval				
< 3 years	130 (91.5)	280 (96.6)	1	
≥ 3 years	12 (8.5)	10 (3.4)	2.58 (1.08-6.16)	0.032
Spousal/partner approval				
No	47 (27.6)	94 (35.8)	1	
Yes	112 (65.9)	62 (23.7)	3.61 (2.28-5.72)	<0.001
Does not know	11 (6.5)	106 (40.5)	0.21 (0.10-0.42)	<0.001
Distance to nearest health facility				
< 5 km	111 (77.1)	178 (61.8)	1	
≥ 5 km	33 (22.9)	110 (38.2)	0.48 (0.30-0.76)	0.002

IV. **Discussion**

This study aimed to identify factors associated with the utilization of modern contraceptive methods (MCM) among women of reproductive age in the Djombo Health Zone, Democratic Republic of the Congo. The findings reveal a gap between contraceptive knowledge and actual practice, suggesting that awareness alone may not be sufficient to ensure contraceptive adoption. The multivariable logistic regression analysis identified several factors significantly associated with MCM utilization, including educational attainment, marital status, inter-pregnancy interval, spousal or partner approval, religious affiliation, and distance to the nearest health facility. These findings highlight the importance of considering interpersonal, sociodemographic, cultural, and geographical factors when designing family planning interventions in rural settings.

a) Modern Contraceptive Prevalence: A Contrasting Picture

Modern contraceptive prevalence in this study was 32.6%, indicating that approximately one-third of the women surveyed reported using a modern contraceptive method. Although this prevalence remains below the levels reported in some sub-Saharan African settings, it exceeds the national rural estimate of 14.2% reported for the Democratic Republic of the Congo (11, 2). It also appears higher than the 24.5% reported in Kinshasa (13), although differences in study periods, populations, sampling approaches, and

contraceptive indicators may limit direct comparisons. In Lesotho, for example, contraceptive use among rural women reportedly increased from 31.8% to 61.9% over two decades (11), illustrating the potential for substantial changes in contraceptive practice over time.

Nevertheless, the prevalence observed in Djombo indicates that a considerable proportion of women may not be benefiting from modern family planning methods. The multivariable findings further suggest that contraceptive utilization is associated with educational attainment, marital status, pregnancy-spacing patterns, partner approval, religious affiliation, and geographical accessibility. Strengthening access to accurate information, quality counselling, and a reliable supply of contraceptives remains important for improving reproductive health outcomes.

b) Spousal/Partner Approval and Modern Contraceptive Utilization

Perceived partner approval was significantly associated with modern contraceptive method (MCM) utilization in the adjusted analysis. Women whose partners approved of contraception had higher odds of utilization than those whose partners disapproved (adjusted OR [aOR] = 3.61; 95% CI: 2.28–5.72; $p < 0.001$). Conversely, women who did not know their partners' opinions had lower odds of utilization than those reporting partner disapproval (aOR = 0.21; 95% CI: 0.10–0.42; $p < 0.001$). These findings highlight the importance of perceived partner attitudes in contraceptive decision-making.

The results are consistent with Hernandez et al. (14), who examined perceived partner approval among couples living in military camps in Kinshasa. Their findings showed that women's perceptions of their partners' opinions were associated with contraceptive use, although these perceptions did not always correspond to partners' actual views. These findings complement the broader discussions of family planning in the Democratic Republic of the Congo reported by Kashiya et al. (15) and Kwete et al. (16).This evidence reinforces the importance of distinguishing perceived approval from actual partner attitudes.

In the present study, the lower odds among women who did not know their partners' opinions may reflect uncertainty regarding contraceptive decision-making. However, communication patterns and the reasons for this uncertainty were not directly assessed. Promoting respectful couple communication and voluntary male engagement may therefore be beneficial. WHO recommendations on contraceptive use emphasize informed and voluntary decision-making (17,18), while Bapolisi et al. (19) highlight the role of personal beliefs, intimate partner negotiations, and social pressure in family planning in eastern DRC. Such approaches should preserve women's reproductive autonomy and ensure that partner authorization is never a condition for accessing contraception. Finally, given the observational design of this study, the reported findings should be interpreted as associations between the variables examined rather than evidence of causal relationship.

c) Educational Attainment and Modern Contraceptive Utilization

Educational attainment remained significantly associated with modern contraceptive method (MCM) utilization after adjustment. Women with secondary or higher education had higher odds of utilization than those with no or low education (aOR = 2.46; 95% CI: 1.69–3.59; $p < 0.001$). This finding identifies educational attainment as an important sociodemographic correlate of contraceptive practice in the Djombo Health Zone.

This result is consistent with multicountry evidence from sub-Saharan Africa reported by Yaya et al. (20) and Boadu (21), which highlighted the association between women's education and modern contraceptive use. Education may facilitate access to health information, understanding of contraceptive options, and participation in reproductive health decisions. However, these mechanisms were not directly assessed in the present study.

These findings support providing accurate, comprehensible, and culturally appropriate

family planning information to women across educational levels. Counselling should explain available methods, their effectiveness, potential adverse effects, and correct use in accessible language. Michael et al. (22) examined factors associated with contraceptive use among sexually active adolescent girls in sub-Saharan Africa, while Adedini et al. (23) discussed the role of religious leaders in promoting family planning. Becker (24) emphasized the importance of couple-focused reproductive health research, and Andro and Hertrich (25) explored the relationship between men's expectations and women's contraceptive preferences. Nevertheless, the specific effects of educational or counselling interventions cannot be established from the present study alone

d) Inter-Pregnancy Interval and Contraceptive Utilization

An inter-pregnancy interval of at least three years was significantly associated with MCM utilization. Women reporting this interval had higher odds of utilization than those in the shorter-interval reference category (aOR = 2.58; 95% CI: 1.08–6.16; p = 0.032). This association may reflect differences in pregnancy intentions and preferences regarding the timing of subsequent pregnancies.

Women wishing to postpone another pregnancy may be more likely to use contraception, while contraceptive use may also contribute to longer intervals between pregnancies. However, the cross-sectional design prevents establishing the temporal direction of this relationship. Furthermore, the inter-pregnancy interval should be distinguished from the birth-to-pregnancy interval addressed in World Health Organization recommendations, which advise waiting at least 24 months after a live birth before attempting another pregnancy (25,26).

Further research incorporating pregnancy intentions, contraceptive history, and clearly defined pregnancy intervals could clarify this association. In practice, family planning counselling should support informed decisions about pregnancy timing and spacing while ensuring voluntary access to a range of contraceptive methods

e) Marital Status and Modern Contraceptive Utilization

Living in a marital union was significantly associated with MCM utilization after adjustment. Women living in a union had higher odds of utilization than women who were not in a union (aOR = 1.70; 95% CI: 1.07–2.69; p = 0.024). This finding suggests that marital or partnership circumstances may be relevant to contraceptive practices in the Djombo Health Zone.

Potential explanations include differences in pregnancy intentions, fertility preferences, partnership communication, and perceived needs for pregnancy spacing. However, these mechanisms were not directly assessed and should not be assumed to explain the observed association. Ahinkorah (12) reported variations in contraceptive use according to union status across 35 sub-Saharan African countries, while Boadu (21) identified sociodemographic characteristics, including marital status, among factors associated with modern contraceptive utilization.

Marital status should not be treated as an indicator of contraceptive need. Women who are single, divorced, widowed, or not living with a partner may also need contraception for pregnancy prevention and reproductive planning. Family planning services should therefore provide confidential, respectful, and non-judgmental counselling to all women of reproductive age, irrespective of marital status

f) Primary Occupation and Economic Considerations

In the bivariate analysis, primary occupation was associated with MCM utilization. Traders and salaried employees had higher crude odds of utilization than female farmers, whereas the estimate for students was based on a small subgroup. However, occupation was not among the statistically significant factors reported in the adjusted results available for this revision. These crude associations should therefore not be interpreted as evidence of an independent association after adjustment.

The predominance of agricultural work in this rural population provides important

socioeconomic context (26). Occupational circumstances may be related to income, mobility, time constraints, access to information, and the practical costs of reaching health facilities. Nevertheless, these explanations were not directly tested, and the observed bivariate associations may partly reflect differences in other characteristics.

Family planning programmes should consider practical barriers faced by women in different occupational groups, including transport costs, time away from work, affordability, and service availability. Economic empowerment may complement such efforts, but it should not replace accessible and affordable reproductive health services (27). Further research incorporating household income and the costs of accessing services would help clarify these relationships.

g) Religious Affiliation and Modern Contraceptive Utilization

Religious affiliation remained significantly associated with MCM utilization in the adjusted analysis. Women reporting no religious affiliation had higher odds of utilization than Christian women (aOR = 2.10; 95% CI: 1.20–3.68; p = 0.009). This finding indicates an association between religious affiliation and contraceptive use but does not establish that religious affiliation itself causes differences in utilization.

Religious affiliation may be associated with individual beliefs, interpretations of religious teachings, family expectations, and community norms. These factors were not separately measured in the present study, so it would be inappropriate to attribute the observed association to specific religious doctrines or practices.

Research in Burkina Faso, Kenya, and Niger has explored how religious and community expectations may shape reproductive decision-making, while research in Nigeria has examined engagement with religious leaders in family planning initiatives (28). Such evidence suggests that collaboration with faith-based organizations may provide opportunities to share accurate information and address concerns about contraception. However, these initiatives should respect religious diversity, avoid stigmatization, and protect individual reproductive autonomy. Qualitative research could further explore how personal beliefs and community expectations relate to contraceptive decision-making in the Djombo Health Zone.

h) Distance to Health Facilities and Geographical Accessibility

Geographical accessibility was significantly associated with MCM utilization in the adjusted analysis. Women living at least 5 km from the nearest health facility had lower odds of utilization than women in the reference distance category (aOR = 0.48; 95% CI: 0.30–0.76; p = 0.002). This finding suggests that distance is an important correlate of contraceptive use in the study population.

Greater distance may increase transport expenses and travel time and make it more difficult for women to attend health facilities while meeting household or occupational responsibilities. However, these specific barriers were not directly measured and should be considered possible explanations rather than demonstrated mechanisms.

Research from Lesotho and Ethiopia has highlighted the importance of access to reproductive health services in underserved settings (29,30). Evidence from Kinshasa also indicates that service availability, geographical access, and the range of contraceptive methods offered at health facilities are relevant to contraceptive utilization (31).

Potential responses include community-based distribution, outreach services, improved referral arrangements, and ensuring that facilities offer a reliable range of contraceptive methods. Such approaches should be evaluated in the local context and accompanied by informed choice, confidentiality, and continuity of care.

i) Contraceptive Availability and Service Delivery

Although contraceptive stockouts were identified in the original conclusion as a potential barrier, the results presented for the Djombo study do not quantify stockouts or establish an association between stock

availability and utilization. Stockouts should therefore not be presented as a finding of this study.

Nevertheless, external evidence supports the relevance of contraceptive availability to family planning services. Research using population-based and health-facility data from Kinshasa found that the supply environment, including the availability of preferred contraceptive methods and the occurrence of stockouts, was associated with modern contraceptive use (31,32).

These findings provide a relevant context for future research and programme planning but cannot be directly generalized to Djombo without local data.

Future studies could assess stock availability, method choice, frequency of stockouts, and service readiness. Until such evidence is available, strengthening supply chains may be considered a reasonable programme priority based on broader evidence, rather than a demonstrated explanation for the prevalence observed in this study.

j) Factors Not Significantly Associated with MCM Utilization

Age and parity were not significantly associated with MCM utilization in the analyses reported for this study. This differs from some multicountry studies in sub-Saharan Africa, which have identified associations between contraceptive use and women's age or number of living children (21,30). Such differences may reflect variation in study populations, fertility intentions, service access, or the distribution of characteristics across subgroups.

However, a non-significant result does not establish that no association exists. Statistical power, subgroup sizes, and other contextual factors may affect the precision of estimates. Furthermore, the available results do not support claims that age or parity independently influences contraceptive utilization in the Djombo Health Zone. Their interpretation should therefore remain cautious.

Overall Interpretation and Public Health Implications

Overall, MCM utilization in the Djombo Health Zone was 32.6%. The adjusted analysis identified partner approval, educational attainment, marital status, inter-pregnancy interval, religious affiliation, and distance to health facilities as factors associated with utilization. These findings highlight the relevance of interpersonal, sociodemographic, reproductive, and geographical circumstances to contraceptive practices.

Public health responses should prioritize accessible family planning services, clear and culturally appropriate information, respectful counselling, and voluntary partner engagement that protects women's decision-making autonomy. Although external evidence indicates that contraceptive supply and service availability may also matter, stockouts were not established as a factor in this study. Future research should directly assess contraceptive availability, pregnancy intentions, household economic circumstances, and communication within couples. Qualitative and longitudinal approaches could help clarify the mechanisms underlying the observed associations and inform interventions adapted to the needs of women in the Djombo Health Zone

4. Strengths and Weaknesses of the Study

This study provides locally relevant evidence on modern contraceptive method utilization among women of reproductive age in the Djombo Health Zone. Its strengths include the three-stage sampling procedure and electronic data collection using KoboCollect, which helped standardize data recording.

However, potential selection bias may have arisen from household recruitment procedures and non-participation, limiting representativeness if participants differed from non-participants. Self-reported information may have been affected by recall and social desirability biases.

In addition, partner approval was based on women's perceptions rather than direct reports from their partners, potentially resulting in misclassification. Small subgroup sizes may have reduced the precision of estimates and statistical power. Residual confounding may also persist because some potentially relevant variables, including household income, desired

family size, and detailed contraceptive knowledge, were not fully assessed. Finally, the cross-sectional design prevents establishing temporality or causal relationships between the factors identified and contraceptive utilization.

CONCLUSION

Modern contraceptive method utilization in the Djombo Health Zone was 32.6%. Educational attainment, marital status, inter-pregnancy interval, partner's attitude, religious affiliation, and distance to health facilities were associated with utilization. These findings support strengthening family planning information, improving geographical access to services, and promoting constructive partner communication. Interventions should respect women's reproductive autonomy and enable informed, voluntary contraceptive choices.

———

Acknowledgements

We are grateful to the Ethics Committee of the Kinshasa School of Public Health for approving the study protocol. We also extend our sincere appreciation to the local facilitators and field supervisors for their ongoing involvement and operational support throughout the data collection process in the Djombo Health Zone.

Disclaimer

The views and opinions expressed in this article are solely those of the authors and do not necessarily reflect the official policy or position of the Kinshasa School of Public Health or any affiliated institutions.

Ethics Statement

Ethics approval was obtained from the Ethics Committee of the Kinshasa School of Public Health (Approval No. ESP/CE/102B/2025). Informed consent (written or thumbprint for illiterate participants) was obtained from all individual participants included in the study prior to data collection

Data Availability

The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request.

Funding

This study received no specific external grant or funding from any agency in the public, commercial, or not-for-profit sectors. It was conducted using self-mobilized resources from the research team, with methodological support from the Kinshasa School of Public Health.

Authorship Contributions

- **Mokolo Ano-bilombe Tom**: Conceptualization, study design, principal investigation, field coordination, and drafting of the initial manuscript.
- **Lievin Tshimanga**: Methodology, statistical analysis, data curation, visualization, interpretation of results, and critical revision of the manuscript.
- **Mambu Therèse**: Supervision, administrative and logistical support, stakeholder mobilization, and critical review of the final scientific content.

All authors read and approved the final version of the manuscript prior to submission.

Disclosure of Interest

The authors completed the ICMJE Disclosure of Interest Form (available upon request from the corresponding author) and declare no financial, personal, or professional conflicts of interest related to this work.

Use of Artificial Intelligence (AI) Declaration:

During the preparation of this work, the authors utilized AI-assisted language models solely to assist with grammatical review, reference verification, and manuscript styling. The authors reviewed and edited the output and take full responsibility for the contents of the published article.

REFERENCES

1. Madonia K, Zerzan R, Baker D, Keogh S, Luchsinger G, Roseman M, et al. Seeing the Unseen: The case for action in the neglected crisis of unintended pregnancy. State of World Population report. New

York: UNFPA; 2022. Available from: https://www.unfpa.org/swp2022
2. MICS-DRC. Multiple Indicator Cluster Survey 2017–2018, Final Report. Kinshasa, Democratic Republic of the Congo: National Institute of Statistics (INS) & UNICEF; 2019.
3. Mbadinga M, Ntsame M. Contraceptive behavior among Gabonese women regarding modern methods: Low prevalence and information deficit. *Afr J Reprod Health*. 2020;24(2):45–56.
4. Coulibaly M, Koumi-Mélèdje MD, Kouame J, Hounsa A, Oga S. Knowledge and use of modern contraception among women of childbearing age in West Africa. *Sante Publique*. 2023;10(1):25–28.
5. Massenga J, Noronha R, Awadhi B, Bishanga DR, Safari O, Njonge L, et al. Adoption of family planning in Kagera and Mara regions in Tanzania: A cross-sectional community survey. *BMC Public Health*. 2021;21(1):1412. doi:10.1186/s12889-021-11453-8.
6. Ahamada FL. Determinants of low modern contraceptive use: Case of the M'rémani health district (Comoros). Moroni: UNFPA Comoros; 2011.
7. Ministry of Public Health, Ministry of Planning, ICF International. Democratic Republic of the Congo Demographic and Health Survey (DHS-DRC II 2013–2014). Rockville, Maryland, USA: MSP, MPSMRSI & ICF International; 2014. Available from: https://dhsprogram.com/pubs/pdf/FR300/FR300.pdf
8. Canning D, Schultz TP. The economic consequences of reproductive health and family planning. *Lancet*. 2012;380(9837):165–171. doi:10.1016/S0140-6736(12)60827-7.
9. Ould Ely A, Mohamed L. Factors associated with modern contraceptive use in Aïoun commune, Mauritania. *Afr Sci*. 2015;11(3):221–228.
10. Provincial Health Division of Équateur. 2023 Annual Activity Report. Mbandaka: Ministry of Public Health, DRC; 2024.
11. Demissie KA, Melak J, Teshale G, Tiruneh MG, Tafere TZ, Hagos A. Multinomial multilevel analysis of factors affecting the use of modern contraceptives in sub-Saharan Africa: Evidence from 2015 to 2023 Demographic Health Surveys. *Sci Rep*. 2025;15(1):16751. doi:10.1038/s41598-025-01622-x.
12. N'djili Health Zone Study Group. Determinants of modern contraceptive use among women aged 18–49 years in the N'djili health zone, DRC. *J Glob Health Rep*. 2025;9. doi:10.7189/001.c157682.
13. Ahinkorah BO. Community-level variations in contraceptive use among women in union and those not in union: A comparative study of 35 sub-Saharan African countries. *Contracept Reprod Med*. 2023;8(1):14. doi:10.1186/s40834-023-00215-w.
14. Hernandez JH, Akilimali PZ, Mbadu MF, Bertrand JT. Spousal approval and modern contraceptive use among military couples in Kinshasa, Democratic Republic of the Congo. *Contracept Reprod Med*. 2022;7(1):18. doi:10.1186/s40834-022-00184-2.
15. Mosuse MA, Gadeyne S. Prevalence and factors associated with unmet need for family planning among women of reproductive age (15–49) in the Democratic Republic of Congo: A multilevel mixed-effects analysis. *PLoS One*. 2022;17(10). doi:10.1371/journal.pone.0275869.
16. Kashiya YM, Akilimali PZ, Lusamba PSD, Coppieters Y. Impact of FP2020 Program on High-Risk Pregnancies and Under-Five Mortality in the Democratic Republic of the Congo: Evidence from a Quasi-Experimental Analysis Using Demographic and Health Surveys (2013–2023). *Healthcare*. 2026;14(4):521. doi:10.3390/healthcare14040521.
17. Kwete D, Binanga A, Mukaba T, Nemuandjare T, Mbadu MF, Kyungu MT,

et al. Family Planning in the Democratic Republic of the Congo: Encouraging Momentum, Formidable Challenges. *Glob Health Sci Pract*. 2018;6(1):40–54. doi:10.9745/GHSP-D-17-00318.

18. World Health Organization. *Selected practice recommendations for contraceptive use*. 3rd ed. Geneva: World Health Organization; 2016. Available from: https://www.who.int/publications/i/item/9789241565400
19. World Health Organization. *Selected practice recommendations for contraceptive use*. 4th ed. Geneva: World Health Organization; 2025. Available from: https://www.ncbi.nlm.nih.gov/books/NBK608428/
20. Bapolisi WA, Martin-Hilber A, Merten S. Family planning in the Eastern Democratic Republic of the Congo: Personal beliefs, intimate partner negotiations and social pressure. *Cult Health Sex*. 2024;26(11):1365–1379. doi:10.1080/13691058.2024.2321911.
21. Boadu I. Coverage and determinants of modern contraceptive use in sub-Saharan Africa: Further analysis of demographic and health surveys. *Reprod Health*. 2022;19:18. doi:10.1186/s12978-022-01332-x.
22. Becker S. Couples and reproductive health: A review of couple studies. *Stud Fam Plann*. 1996;27(6):291–306. doi:10.2307/2138025.
23. Andro A, Hertrich V. Contraceptive demand in the Sahel: Are men's expectations drawing closer to those of their wives? *Population*. 2002;57(4):721–771. doi:10.2307/3219488.
24. Michael TO, Olawole-Isaac A, Olamijuwon JO. Prevalence and factors associated with contraceptive use among sexually active adolescent girls in 25 sub-Saharan African countries. *PLoS One*. 2024;19(2). doi:10.1371/journal.pone.0297411.
25. Adedini SA, Odimegwu C, Bamiwuye O, Faye O, Wet A. Role of religious leaders in promoting family planning in sub-Saharan Africa. *J Relig Health*. 2018;57(5):1831–1848. doi:10.1007/s10943-018-0628-9.
26. World Health Organization. *Report of a WHO technical consultation on birth spacing: Geneva, Switzerland, 13–15 June 2005*. Geneva: World Health Organization; 2007.
27. Ettarh RR, Kyobutungi C, Amugsi D. Physical access to health facilities and contraceptive use in Kenya. *Afr J Reprod Health*. 2012;16(3):48–56.
28. Agadjanian V, Hayford SR. Bridging user and provider perspectives: Family planning access and utilization in rural Mozambique. *Int J Gynaecol Obstet*. 2015;130(Suppl 3)–E51. doi:10.1016/j.ijgo.2015.03.007.
29. Heard NJ, Larsen U, Hinds BR. Investigating access to reproductive health services using GIS: Proximity to services and the use of modern contraceptives in Malawi. *Afr J Reprod Health*. 2004;8(2):164–179. doi:10.2307/3583189.
30. World Health Organization. Family planning/contraceptive methods: Fact sheet. Geneva: World Health Organization; 2025. Available from: https://www.who.int/news-room/fact-sheets/detail/family-planning-contraception
31. World Health Organization. *Scaling up family planning approaches: Optimizing task sharing, post-pregnancy care and social behaviour change*. Geneva: World Health Organization; 2025.
32. Sano Y, Antabe R, Atuoye KN, Luginaah I. Married women's autonomy and post-delivery modern contraceptive use in the Democratic Republic of Congo. *BMC Women's Health*. 2018;18(1):49. doi:10.1186/s12905-018-0540-1