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Review Article

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Association Between Contraceptive Knowledge and Decision-Making Autonomy on the Use of Modern Contraception in Parakou, 2025

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ABSTRACT

Introduction: The use of modern contraception remains insufficient in sub-Saharan Africa. This study examines the influence of contraceptive knowledge and women's decision-making autonomy on modern contraceptive use in Parakou.

Methods: An analytical cross-sectional study was conducted in 2025 among 421 women of reproductive age in Parakou. Contraceptive knowledge and decision-making autonomy were assessed using composite scores. Probit and multivariable logistic regression models, adjusted for age, parity, and exposure to information, were applied. Predictive performance was evaluated using receiver operating characteristic (ROC) curves.

Results: The mean age of participants was 31.8 ± 10.1 years. The contraceptive knowledge score was strongly and independently associated with modern contraceptive use in multivariable logistic regression ($\beta = 0.19$; $p < 0.001$), corresponding to an approximate 21% increase in the odds of use for each additional unit increase in knowledge. Probit regression analysis confirmed a significant dose–response relationship between contraceptive knowledge and the predicted probability of modern contraceptive use. Women's decision-making autonomy showed a positive association with modern contraceptive use, reaching borderline statistical significance ($p \approx 0.06$). The combined logistic model demonstrated moderate discriminative ability, with an area under the ROC curve of 0.657, indicating predictive performance better than chance.

Conclusion: Contraceptive knowledge is the primary determinant of modern contraceptive use in Parakou, while women's decision-making autonomy remains constrained by social and relational contexts, which limits its independent effect on contraceptive uptake.

Keywords: Modern Contraception, Contraceptive Knowledge, Decision-Making Autonomy, Women, Benin

Introduction

The use of modern contraceptive methods remains a major public health concern in low- and middle-income countries, particularly in sub-Saharan Africa, where fertility levels remain high and unmet needs for family planning persist. Despite measurable progress over the past decade, overall utilization rates remain modest and are characterized by pronounced social, geographic, and cultural disparities. In Ethiopia, the recent increase in modern contraceptive use has been largely attributed to behavioral changes rather than demographic transitions, highlighting the decisive role of cognitive and social factors [1]. Similar trends have been reported in Senegal and other West African countries, where education, access to information, and marital context strongly shape contraceptive behaviors [2].

Among these determinants, the level of knowledge about modern contraceptive methods consistently emerges as a key factor, yet it is rarely explored in its full complexity. Several studies indicate that while awareness of the existence of modern methods is relatively widespread, understanding of their mechanisms of action, side effects, and conditions of access often remains fragmented. In the Democratic Republic of the Congo, poor knowledge of contraceptive methods substantially increased the risk of non-use

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among sexually active adolescents [3]. In Myanmar, Lun (2021) [4] demonstrated a strong association between contraceptive knowledge and utilization, regardless of marital status. These findings suggest that knowledge is not merely an informational prerequisite, but rather a central lever in decision-making and individual adoption of contraceptive practices.

However, the translation of knowledge into effective use cannot be fully understood without considering decision-making dynamics. Female decision-making autonomy, often presented as a key determinant, has shown mixed effects depending on the context. These observations underscore the need to jointly examine contraceptive knowledge and decision-making processes in order to better understand the true determinants of modern contraceptive use. This study aims to assess the association between contraceptive knowledge and women's decision-making autonomy and the use of modern contraception in Parakou, Benin, by quantifying the gradient effect of knowledge and examining the independent contribution of decision-making autonomy.

Study Methods

This was an observational cross-sectional study with descriptive and analytical aims, based on prospective data collection, conducted in 2025 in the city of Parakou, Benin. The study population consisted of women aged 15–49 years who had been residing in Parakou for at least six months. All women meeting these criteria and providing informed consent were included. Women who were pregnant and desiring pregnancy, severely ill, unable to respond, or with incomplete questionnaires were excluded.

A probabilistic sampling strategy was used to survey 421 women. The dependent variable was the use of modern contraception (yes/no). Independent variables included a sexual and reproductive health knowledge score, constructed from five items (knowledge of modern methods, their effectiveness, conditions for correct use, side effects, and locations of family planning services), each rated on a Likert scale ranging from 0 to 4 points; a female decision-making autonomy index, measured using a seven-item adapted Demographic and Health Survey (DHS) scale (decision to use contraception, choice of method, timing of initiation or discontinuation, consultation of family planning services, expenditures related to contraception, personal healthcare, and discussion with the partner); as well as sociodemographic and contextual characteristics, including age, parity, educational level, marital status, distance to the nearest health facility, exposure to family planning messages, and perception of contraceptive side effects. The contraceptive knowledge score ranged from 0 to 20, with acceptable internal consistency (Cronbach's $\alpha \geq 0.70$).

Data were collected through direct interviews using a structured and pre-tested questionnaire, administered face-to-face by trained interviewers. Statistical analyses were performed using R, MedCalc, Jamovi, and Epi Info software, and included descriptive analyses followed by multivariable analyses using binary logistic regression, receiver operating characteristic (ROC) curve analysis, and probit regression to identify independent determinants of modern contraceptive use. Statistical significance was set at $p < 0.05$. Ethical and deontological principles were strictly respected, including free and informed consent, confidentiality, and anonymity of participants.

Results

The mean age of the women was 31.77 ± 10.09 years (range: 15–49 years). Overall, the use of modern contraceptive methods was relatively comparable across age groups, parity levels, and exposure to family planning messages. Utilization appeared slightly higher among women with a higher level of education and among married women.

Table 1: Distribution of Women of Reproductive Age According to Sociodemographic Characteristics and Use of Modern Contraception in Parakou, 2025

	N	Use of modern contraceptive methods	
		No n (%)	Yes n (%)
Age (years)			
< 20	61	32(52.46)	29(47.54)
[20 ; 30]	131	69(52.67)	62(47.33)
[30 ; 40]	109	54(49.54)	55(50.46)
≥ 40	120	64(53.33)	56(46.67)
Educational level			
No formal education	109	55(50,46)	54(49,54)
Primary	94	52(55.32)	42(44.68)
Secondary	122	66(54.10)	56(45.90)
Higher education	96	46(47.92)	50(52.08)
Exposure to family planning messages			
Yes	221	110(49.77)	111(50.23)
No	200	109(54.50)	91(45.50)
Parity			
Nulliparous	91	49(53.85)	42(46.15)
Primiparous	121	62(51.24)	59(48.76)
Multiparous	209	108(51.67)	101(48.33)
Marital status			
Single	88	47(53.41)	41(46.59)
Married	89	39(43.82)	50(56.18)
Cohabiting	86	47(54.65)	39(45.35)
Divorced	82	48(58.54)	34(41.46)
Widowed	76	38(50.00)	38(50.00)

Prevalence of Modern Contraceptive Use

The prevalence of use of at least one modern contraceptive method was 47.98% (95% CI: 43.25–52.75). Condoms were the most commonly used method, accounting for 28.32% of all users.

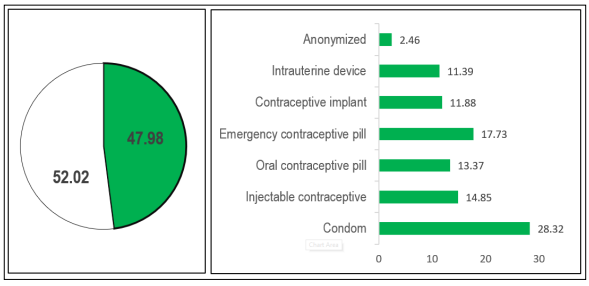

Figure 1: Distribution Of Surveyed Women According to the Use and Type of Modern Contraceptive Methods (Parakou, 2025)

Levels of Knowledge of Modern Contraceptive Methods

Overall, the level of knowledge of modern contraceptive methods ranged from moderate to high, with a predominance of the response categories "moderately," "well," and "very well" across all items. However, knowledge regarding side effects and access to family planning services showed greater heterogeneity.

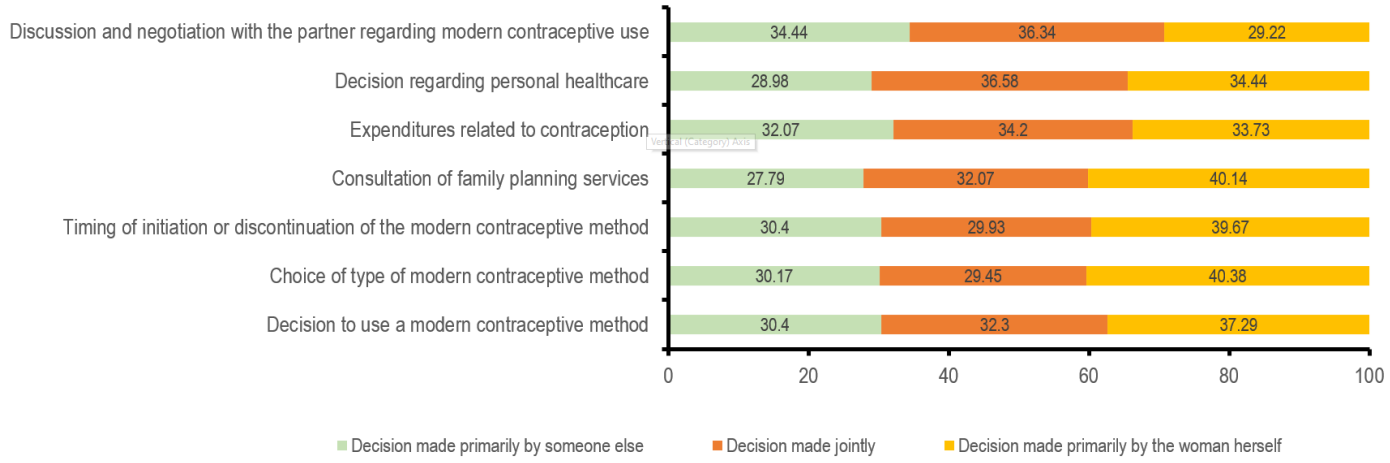

Figure 2: Distribution of Levels of Knowledge of Modern Contraceptive Methods Among Women of Reproductive Age in Parakou, 2025

Decision-Making Modalities Regarding Modern Contraceptive Use

Decisions related to the use of modern contraceptive methods were predominantly made by the woman herself or jointly with her partner. Decision-making by a third party remained marginal across all dimensions considered (see Figure 2).

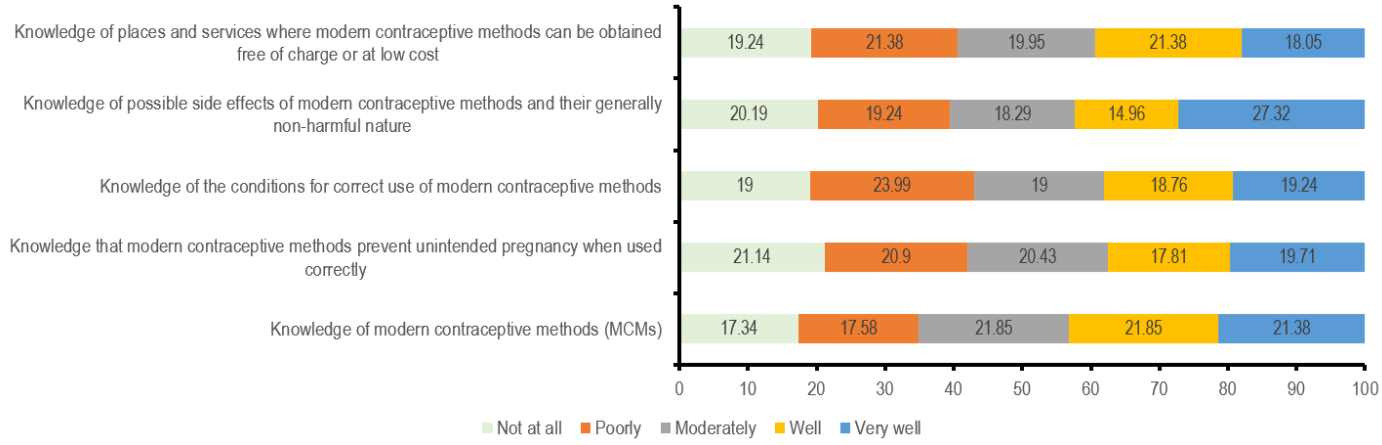

Figure 3: Distribution of Decision-Making Modalities Regarding Modern Contraceptive Use (Adapted Dhs Scale) Among Women of Reproductive Age in Parakou, 2025

Effect of Contraceptive Knowledge Level on the Predicted Probability of Modern Contraceptive Use Coefficients and Standard Errors

The results demonstrate a strong, positive, and highly statistically significant association between the cumulative contraceptive knowledge score and the actual use of a modern contraceptive method. The significant improvement in the fit of the full model compared with the null model ($\chi^2 = 30.86$; df = 1; $p < 0.0001$) confirms that women's knowledge explains a meaningful proportion of the variability in contraceptive use, with pseudo-R^2 coefficients of 0.071 for Cox & Snell and 0.094 for Nagelkerke.

Relationship Derived from the Probit Model Between Contraceptive Knowledge Score and the Probability of Modern Contraceptive Use

The positive coefficient of the contraceptive knowledge score ($\beta = 0.109$; SE = 0.020; $p < 0.0001$) indicates that each one-unit increase in the knowledge score is associated with a significant increase in the predicted probability of using a modern contraceptive method.

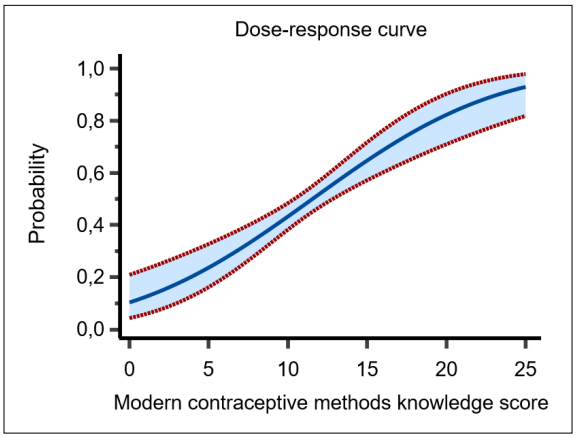

Figure 4: Dose–Response Curve Between the Contraceptive Knowledge Score and the Probability of Modern Contraceptive Use Among Women in Parakou, 2025

Table 2: Probit Regression Estimates of the Association Between Contraceptive Knowledge Score and Modern Contraceptive Use (Parakou ; 2025)

Variable	Coefficient	Standard error	Wald	P-value
Contraceptive knowledge score	0.10949	0.020211	29.3475	<0.0001
Intercept	-1.26496	0.23316	29.4333	<0.0001

Effect of Women's Decision-Making Autonomy on Modern Contraceptive Use

The analysis revealed a positive but weak and statistically non-significant relationship. The improvement in model fit of the full model compared with the null model was limited (χ^2 = 3.44; df = 1; p = 0.0638), suggesting that the explanatory contribution of the DHS-based decision-making autonomy index to contraceptive use is marginal. The Cox & Snell (R^2 = 0.008) and Nagelkerke (R^2 = 0.011) pseudo-coefficients of determination further confirm that women's decision-making autonomy regarding contraception explains only a very small proportion of the observed variability in contraceptive behavior.

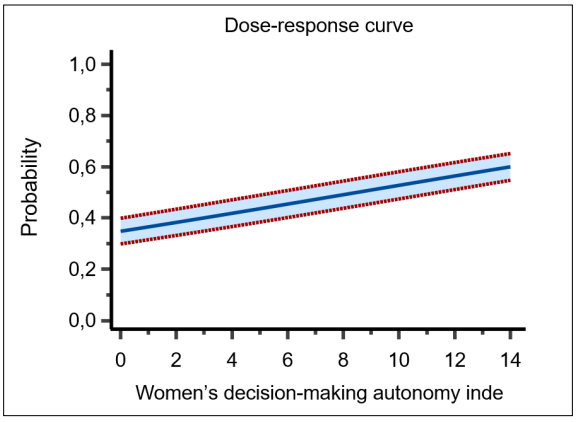

Figure 5: Dose–Response Curve Between Women's Decision-Making Autonomy Index and the Probability of Modern Contraceptive Use Among Women in Parakou, 2025

Predictive Performance of the Logistic Regression Model Including the Contraceptive Knowledge Score and the Female Decision-Making Autonomy Index

The area under the ROC curve (AUC) was 0.657 (95% CI: 0.609–0.702), indicating a moderate but statistically significant discriminative ability of the model to predict modern contraceptive use. As the AUC was significantly greater than 0.5 (z = 5.934; p < 0.0001), the model demonstrated predictive performance better than chance.

The maximum Youden index (J = 0.2405), obtained at a predicted probability threshold greater than 0.513, corresponded to a sensitivity of 50.99% and a specificity of 73.06%.

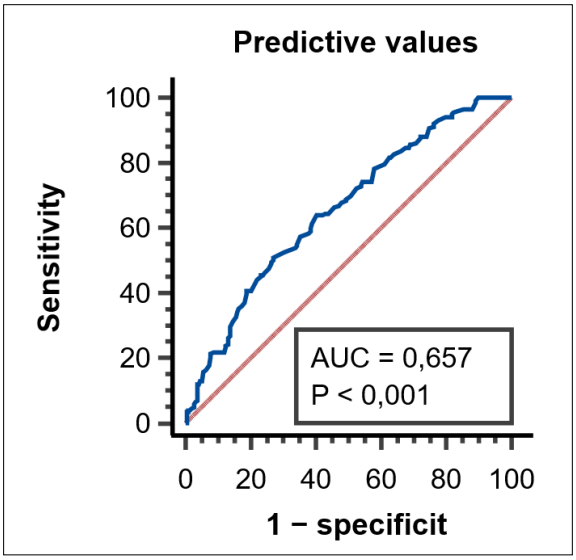

Figure 6: Predictive Performance of the Logistic Model Combining Contraceptive Knowledge and Decision-Making Autonomy In Predicting Modern Contraceptive Use (Roc Curve)

Logistic Regression Model Assessing the Association Between Women's Decision-Making Score and Modern Contraceptive Use, Adjusted for Age, Parity, and Exposure to Information

The coefficient of the adapted DHS decision-making score was positive (β = 0.046; SE = 0.025), indicating a tendency toward increased odds of contraceptive use with higher levels of women's decision-making autonomy. However, this association remained at the threshold of statistical significance (p = 0.064), corresponding to an approximate 4.7% increase in the odds of contraceptive use for each additional unit of the decision-making score (OR ≈ 1.05). The dose–response analysis nevertheless suggested an increasing relationship between the DHS score and the predicted probability of contraceptive use, with a shift toward higher probabilities at higher score levels.

Multivariable Binary Logistic Regression Analysis

The multivariable binary logistic regression, conducted among 421 women and adjusted for age, parity, and recent exposure to family planning information, showed an overall satisfactory model fit (deviance = 513; AIC = 601; McFadden's R^2 = 0.121). The contraceptive knowledge score was strongly and independently associated with modern contraceptive use (β = 0.19; SE = 0.03; p < 0.001), corresponding to an approximate 21% increase in the odds of use for each additional unit increase

in knowledge (OR ≈ 1.21). In contrast, the women's decision-making autonomy index showed a positive but non-significant association at the 5% threshold (β = 0.077; p = 0.088).

Coefficients and Standard Errors

Table 3: Logistic Regression Estimates of the Association Between Women's Decision-Making Autonomy and Modern Contraceptive Use, Adjusted for Age, Parity, And Exposure to Information (Parakou; 2025)

	Coefficient	Standard Error	Wald	P
Adapted DHS score	0.04	0.02	3.42	0.0643
Intercept	-0.39	0.19	4.06	0.0437

Table 4: Multivariable Logistic Regression Estimates of Predictors of Modern Contraceptive Use

Predictor	Estimate	Standard Error	Z	p
Intercept	-1.63	1.01	-1.61	.107
Contraceptive knowledge score	0.19	0.03	5.34	<.001
Decision-making autonomy index	0.077	0.04	1.70	.088

Discussion

The findings of this study are situated within a context in which the use of modern contraceptive methods is increasing slowly but remains deeply shaped by knowledge, gender relations, and social decision-making frameworks. The observed mean age corresponds to a phase of active reproductive life, comparable to that reported in Ethiopia and Senegal, where contraceptive use tends to stabilize after the first birth without reaching optimal levels [1,2]. The absence of marked variation according to age and parity suggests that, in this context, biological factors play a secondary role compared with cognitive and social determinants.

The overall moderate-to-high level of contraceptive knowledge reflects a pattern widely documented across several sub-Saharan African countries. In the Democratic Republic of the Congo, Mpunga (2022) [3] already showed that while awareness of the existence of modern contraceptive methods is relatively widespread, understanding of their mechanisms of action, side effects, and conditions of access remains incomplete, thereby limiting sustained adoption. Comparable findings have been reported among Ghanaian adolescents, where adherence to modern methods coexists with persistent misconceptions regarding associated risks [5].

The heterogeneity observed in knowledge of side effects and access modalities is not trivial. In Ethiopia, decomposition analyses conducted by Gebrekidan et al. in 2025 [1] demonstrated that behavioral changes, rather than shifts in demographic composition, largely explain recent increases in contraceptive use. These behavioral changes are closely linked to improved mastery of practical information, rather than mere exposure to generic family planning messages. When such information remains partial, it may even reinforce mistrust, as observed among Congolese adolescents, where poor knowledge markedly increased the risk of non-use [3].

The strong, positive, and highly significant association between the cumulative contraceptive knowledge score and actual use of a modern method aligns closely with international evidence. In Myanmar, Lun (2021) [4] reported that knowledge of modern contraceptive methods was among the most consistent predictors of use, regardless of marital status. In Ethiopia and other high-fertility settings in sub-Saharan Africa, multilevel analyses similarly confirm that each incremental gain in knowledge translates into a measurable increase in the probability of contraceptive use [6].

The robustness of this association, supported by non-negligible pseudo-R^2 values and a substantial improvement in model fit, reinforces the interpretation of knowledge as a genuine causal lever. By contrast, the female decision-making autonomy index exhibited a positive but weak and statistically fragile relationship with contraceptive use. This dissociation between knowledge and decision-making power has previously been documented in Chad, where Allambademel et al. (2025) showed that women's declared autonomy did not systematically translate into higher contraceptive uptake [7]. Similarly, in a multi-country analysis across Asia and sub-Saharan Africa, Anik (2022) [8] observed that decision-making autonomy could paradoxically coexist with unmet need for modern contraception.

The predominance of individual or joint decision-making observed in this study reflects an incomplete transition toward effective reproductive autonomy. In several African contexts, joint decision-making does not necessarily imply equality of power but rather asymmetric negotiation shaped by marital and community norms [6]. Studies conducted in Burkina Faso and Ethiopia indicate that even when women initiate the decision, validation by partners or authority figures often remains implicit [9].

The moderate predictive performance of the logistic model, with an area under the ROC curve significantly greater than chance, confirms that knowledge constitutes a central but non-exclusive determinant of contraceptive use. Other unmeasured factors, such as the quality of service delivery, continuity of supply, and the nature of interactions with healthcare providers, have been identified as major determinants of contraceptive behavior in several national studies [2,10]. This intermediate discriminative capacity thus reflects the intrinsic complexity of contraceptive decision-making.

Several limitations warrant careful consideration. The cross-sectional design precludes establishing strict temporal causality between knowledge, decision-making autonomy, and contraceptive use—a constraint shared by most studies in this field, particularly those based on DHS or PMA surveys [1,3]. Moreover, while composite scores are methodologically relevant, they may obscure important qualitative dimensions, including the specific nature of knowledge or the depth of actual decision-making power.

Another potential limitation relates to social desirability bias, particularly in self-reported measures of decision-making autonomy and contraceptive use. Several authors have noted that such biases tend to overestimate women's autonomy in contexts where social norms remain restrictive [8].

Despite these limitations, the methodological rigor of the analysis constitutes a major strength. The combined use of probit and logistic models, the assessment of predictive performance through ROC analysis, and adjustment for key covariates enhance the robustness of the findings. Few studies in West or Central Africa have simultaneously examined the effects of knowledge and decision-making autonomy with such analytical depth.

The implications are clear. Future interventions would benefit from shifting the focus of family planning policies toward a qualitative deepening of knowledge, particularly regarding side effects and access to services. Moreover, the findings invite a reconceptualization of decision-making autonomy not as an isolated individual attribute but as a relational process to be addressed at the couple and community levels. Finally, the integration of longitudinal and mixed-methods approaches would enable a more nuanced understanding of contraceptive trajectories and the critical gaps between intention, decision, and actual use.

Conclusion

The use of modern contraception in Parakou is strongly influenced by women's level of reproductive health knowledge, which constitutes a key lever for informed contraceptive choices. Although decision-making autonomy appears favorable, it remains shaped by social and relational contexts. Strengthening access to information, women's empowerment, and couple-based dialogue is therefore essential to sustainably improve modern contraceptive uptake.

Conflicts of Interest

The authors declare that they have no conflicts of interest related to this study.

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