The dynamics of Long-Acting Reversible Contraception (LARC) choices in rural Jambi: Socio-economic perspectives

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DOI:	Received:	Revised:	Accepted:	Published:
10.22437/ppd.v12i1.29800	04.12.2023	23.04.2024	24.04.2024	25.04.2024

Abstract

High population growth without concurrent improvements in human quality poses significant challenges in promoting equitable welfare across various life aspects. Thus, population control is crucial for achieving sustainable development goals. This study emphasizes the role of Long-Acting Reversible Contraception (LARC) in managing fertility rates and investigates three main components of population growth: fertility, mortality, and migration. The objectives are threefold: 1) Analyze the profile of fertile-age couples using LARC in rural Jambi; 2) Investigate the socio-economic factors influencing the choice between LARC and non-LARC methods among these couples; 3) Explore the relationship between the couples' characteristics and their choice of LARC. Data were collected from a survey of 200 fertile-age couples participating in a family planning program across four villages in Jambi. The analysis utilized descriptive statistics, binary logistic regression, and multinomial logistic regression. Findings indicate that LARC usage among fertile-age couples in rural Jambi is low, at approximately 28% of total contraceptive users, with implants being the most common LARC type. In contrast, non-LARC methods are more prevalent, accounting for 72% of usage, dominated by three-month injectables, followed by pills and male condoms. Significant factors influencing the choice between LARC and non-LARC include the husband's education, the woman's employment status, the number of living children, the disparity between actual and ideal family size, desire for more children, knowledge about contraceptive options, and family income. Furthermore, characteristics significantly related to the choice of LARC methods such as tubal ligation, implants, and IUDs include the woman's age, number of living children, the gap between the ideal and actual number of children, desire for more children, woman's employment status, knowledge about contraceptive devices, and family income.

Keywords: *Fertility control, Long-Acting Reversible Contraception (LARC), Socio-economic factors*

JEL Classification: I15, J13, O15

INTRODUCTION

High population growth in a region can pose significant challenges for development. When improvements in human quality do not accompany population increases, they can hinder efforts to achieve equitable welfare across various aspects of

life. Consequently, controlling population growth becomes a priority to ensure the achievement of sustainable development goals.

Jambi Province, a region in Indonesia, has experienced relatively high population growth. Between 2010 and 2020, the annual population growth rate in Jambi Province was 1.34 percent, higher than the national average of 1.25 percent (BPS, 2021). This growth is primarily driven by three components: fertility, mortality, and migration, with fertility being the most significant and the focus of regional policy interventions. The Total Fertility Rate (TFR) in Jambi Province, recorded at 2.51, consistently exceeds the national average of 2.41 since 1971.

The Family Planning Program has been the primary strategy to address this demographic challenge. Since its inception in 1971, the program has significantly reduced the birth rate from 5.6 children per woman in 1971 to 2.6 in 2002/2003. Although the TFR decreased to 2.4 children in 2017, further reductions have stagnated.

The main factor contributing to the reduction in birth rates is the use of Long-Acting Reversible Contraception (LARC), such as IUDs, implants, tubectomy (female surgical operation or MOW), and vasectomy (male surgical operation or MOP) (Prawirohardjo, 2014). However, in 2022, the use of LARC in Indonesia was 22.24 percent, below the target set of 29.00 percent (Siperindu, 2023).

In Jambi Province, the use of LARC fell short of the target, at only 17.92 percent, significantly below the target. The use of LARC in rural areas was even lower, at 10.94 percent, compared to 14.44 percent in urban areas (BPS, 2023).

According to Green's theory (Green, 2005) and the Health Belief Model (HBM) (Rosenstock et al., 1988), contraceptive choices are influenced by predisposing, enabling, and reinforcing factors, as well as perceptions of susceptibility, severity, benefits, and barriers. Factors such as education, occupation, income, and family support have been shown to correlate with contraceptive choices (Duze & Mohammed, 2006; Widyastuti & Mahmudah, 2012).

This study aims to: 1) Analyze the profile of family planning participants using LARC in rural Jambi Province; 2) Identify socio-economic factors that influence the choice of LARC and non-LARC contraceptive methods by family planning participants in Jambi Province; 3) Explore the correlation between the characteristics of family planning participants and the choice of LARC contraceptive methods in rural Jambi Province.

Several studies have investigated factors affecting contraceptive choice, revealing significant correlations with welfare level, parity, education, knowledge about contraceptives, perception of birth limitation, attitude, family support, and environmental factors (Aldriana, 2015; Budiarti et al., 2017; Herlinawati & Santosa, 2013; Ningrum et al., 2016). Particularly, research across various regions in Indonesia has underscored the influence of these factors on contraceptive choices, especially MKJP (Dewi & Notobroto, 2014; Mirawati, 2018; Rizani, 2019; Sudiarti & Kurniawidjaya, 2013).

Given the demographic and socio-economic conditions in Jambi Province, this study seeks to provide new insights into the determinants of LARC choice, which will inform policy formulation to enhance LARC use in rural areas. The significant role of health workers and community leaders in influencing LARC use, as noted by Qurniawati (2016) and Kumaladewi & Pelupessy (2018), is also acknowledged. Additionally, this study considers factors such as age, number of children, knowledge, attitude, side effects, health status, and cost in choosing LARC, as Rizani (2019) highlighted in Majalengka Regency. Research focusing on knowledge related to family planning devices, as conducted by Sari et al. (2019) in Polewali Mandar and Canda et al. (2015) in Palu, supports the importance of this factor in influencing LARC choice.

By examining these factors, this study aims to provide recommendations that can improve the effectiveness of the Family Planning Program in Jambi Province, especially in increasing the use of LARC in rural areas. This is crucial considering the current low use of LARC in rural areas, which is only 10.94 percent compared to 14.44 percent in urban areas (BKKBN, 2017). A thorough understanding of the socio-economic determinants of LARC choice in Jambi Province is essential for the success of the Family Planning Program in achieving sustainable development goals.

METHODS

This study employs a mixed-methods approach, integrating quantitative and qualitative techniques to collect and analyze data. Primary data is sourced from family planning participants in rural areas of Jambi Province, while secondary data regarding population and family planning statistics are gathered from relevant departments and agencies.

The population for this study includes all couples of reproductive age who are family planning participants in rural Jambi Province. The sample selection is conducted through a two-stage stratified sampling method. The first stage involves the purposive sampling of villages based on geographical criteria and the level of LARC usage. The second stage entails selecting household samples using random sampling.

Sampling Procedure

1. First Stage: Select one district from each of Jambi's Eastern and Western regions based on the highest LARC usage rates. From each chosen district, select two villages with the highest LARC usage rates according to secondary data.
2. Second Stage: In each selected village, 50 family planning participants were randomly selected based on the BKKBN's 2019 family census data.

Data is collected using questionnaires about the socio-economic and demographic characteristics of family planning participants, their contraceptive use, and their knowledge of family planning. In-depth interviews are also conducted with selected households to gather qualitative data.

Descriptive analysis using single and cross-frequency tables to analyze the profile of LARC users, including individual and family characteristics. Furthermore, a binary logit regression model analyzes the determinants of choosing LARC over non-LARC among family planning participants. The analyzed variables include the woman's age, formal education, employment status, number of living children, desire to have more children, knowledge about contraceptive types, and family income, according to the following equation:

$$Y = \beta 0 + \beta_1 X_1 + \beta_{2.1} X_{2(1)} + \beta_{2.2} X_{2(2)} + \beta_3 X_{3(1)} + \beta_3 X_{3(1)} + \beta_{4.1} X_{4(1)} + \beta_{4.2} X_{4(2)} + \beta_6 X_6 + \beta_{7.1} X_{7(1)} + \beta_{7.2} X_{7(2)} + \beta_8 X_8 + \beta_9 X_9 + ei$$

Where:

Y = probability of family planning participants choosing LARC (0 = Non- LARC; 1 = LARC)

X1 = Woman's age (years)

X2 = Woman's formal education (with basic category below junior high school), coded as:

X2(1) = 1 for high school; 0 for others

X2(2) = 1 for higher education; 0 for others

X3 = Partner/husband's formal education (with basic category below junior high school), coded as:

X3(1) = 1 for high school; 0 for others

X3(2) = 1 for higher education; 0 for others
X4 = Woman's employment status (with the basic category being housewife), coded as:
X4(1) = 1 for non-agricultural work; 0 for others
X4(2) = 1 for agricultural work; 0 for others
X5 = Number of living children
X6 = Difference between the number of living children and the perceived ideal number of children
X7 = Dummy for the desire to have more children (with basic category wanting more children), coded as:
X7(1) = 1 for undecided/unknown; 0 for others
X7(2) = 1 for not wanting; 0 for others
X8 = Average score of knowledge about contraceptive types
X9 = Family income per month (in million rupiah)

A multinomial logit regression model is employed to analyze the correlation between the characteristics of family planning participants and the choice of MKJP contraceptive types. The same variables as in the binary logit model are analyzed to determine factors influencing the choice of contraceptive type.

RESULT AND DISCUSSION

Characteristics of family planning participants

This section explores the demographic and socio-economic characteristics of family planning participants in the rural areas of Jambi Province, focusing on the age, education, occupation, and income of both husbands and wives.

Age

The analysis of age distribution reveals that the predominant age group for husbands and wives among family planning participants is the 35–39 years range, as shown in Table 1. This age group is often considered a critical period in family planning because many couples at this stage may already have children and are contemplating whether to expand their family. Economic factors, health, and their children's education often become primary considerations at this point (Bianchi & Milkie, 2010; United Nations, 2015b).

Table 1. Age distribution of husbands and wives among family planning participants in rural Jambi Province in 2023

Age Group	Husbands		Wives	
	Frequency	Percentage	Frequency	Percentage
=< 24	5	7.0	23	11.5
25 - 29	20	10.0	26	13.0
30 - 34	21	10.5	45	22.5
35 - 39	54	27.0	52	26.0
40 - 44	50	25.0	45	22.5
45 - 49	33	16.5	9	4.5
50 +	17	8.5	0	0
Total	200	100.0	200	100.0
Average age	39.0		34.6	

The average age of husbands is 39.0 years, while the average age of wives is 34.6 years, resulting in an average age difference of 4.4 years. This average age difference between husbands and wives may reflect local norms or customs that could influence power dynamics and decision-making within the household (England & McClintock, 2009; Schwartz & Han, 2014). In some cultures, a significant age difference may be

associated with a traditional authority structure, while a smaller age difference may indicate a more egalitarian view of marital relationships.

Education

In rural areas of Jambi Province in 2023, most husbands and wives participating in family planning programs possess a relatively high level of education. Specifically, 56.5% of husbands and 55.5% of wives have attained an education level equivalent to Senior High School (SLTA) or higher, as depicted in Table 2.

Table 2. Distribution of the highest education level of husbands and wives among family planning participants in rural areas of Jambi Province, 2023

Education	Husbands		Wives	
	Frequency	Percentage	Frequency	Percentage
Did not complete elementary school	3	1.5	1	.5
Elementary School	39	19.5	29	14.5
Junior High School	45	22.5	59	29.5
Senior High School	81	40.5	83	41.5
Diploma 1-III	12	6.0	7	3.5
Diploma IV/Undergraduate	20	10.0	21	10.5
Total	200	100.0	200	100.0

Couples with at least a high school education are generally more aware of the benefits and options available in family planning, potentially leading to greater participation in family planning programs. They are likelier to make informed decisions regarding the number of children they want and the spacing of pregnancies (Bongaarts & Casterline, 2013; Upadhyay & Karasek, 2010). Additionally, higher education may influence social and cultural attitudes toward family planning, often associating increased educational attainment with values that support birth control and smaller family sizes, which can support the decision to participate in family planning programs (UNESCO, 2015).

Employment

Regarding employment, most husbands (55.0%) work as farmers or agricultural laborers, while 36.0% work in the private sector or are self-employed. A smaller percentage (9.0%) are employed as civil servants or on a contract basis. Conversely, 58.0% of wives primarily fulfill the role of homemakers, reflecting traditional gender roles within the family context in rural areas, as shown in Table 3.

Table 3. Distribution of employment of husbands and wives among family planning participants in rural areas of Jambi Province, 2023

Employment	Husbands		Wives	
	Frequency	Percentage	Frequency	Percentage
Farmer/Agricultural Laborer	110	55.0	31	15.5
Civil Servant	18	9.0	13	6.5
Private Sector/Self-Employed	72	36.0	40	20.0
Homemaker	0	0.0	116	58.0
Total	200	100.0	200	100.0

The high percentage of husbands working as farmers or agricultural laborers indicates that agriculture remains a predominant sector in the rural economy. Meanwhile, employment as civil servants or in the private sector, or entrepreneurship, though less common, indicates some degree of economic diversification. Most wives serving as homemakers reflect societal and structural norms that traditionally assign women to household and childcare roles, a common phenomenon in many rural communities. This role may also be influenced by limited access to opportunities for

further education and formal employment for women in these areas (Lewis, 2010; Razavi & Turquet, 2016).

Income

The average monthly income of family planning participants in rural areas of Jambi Province is IDR 2,448,250. Most families (56.5%) have a monthly income ranging from IDR 1,500,001 to IDR 3,000,000, placing over half of these families within the middle-income category. This indicates that most families have stable economic capabilities, which are crucial for making informed decisions about health, education, and other necessities. Additionally, approximately 28.0% of families earn below IDR 1,500,000 per month, while 15.5% exceed IDR 3,000,000 per month, as detailed in Table 4.

Table 4. Distribution of average monthly family income of family planning participants in rural areas of Jambi Province, 2023

Income Group (IDR)	Frequency	Percentage
=< 1.500.000	56	28.0
1.500.001 - 3.000.000	113	56.5
> 3.000.000	31	15.5
Total	200	100.0
Average income	2.448.250	

Types of contraceptives used

Contraceptive methods are categorized into two main types based on their duration of effectiveness: Long-Acting Reversible Contraceptives (LARC) and non-LARC. LARC includes methods such as IUDs, implants, and male and female sterilization, which are effective from three years up to a lifetime. Non-LARC encompasses shorter-duration methods such as condoms, pills, and injectables. Among family planning participants in rural Jambi Province, the use of LARC is relatively low, accounting for only 28.0% of total users. The implant is the most commonly used method in the LARC category. In contrast, non-LARC are more frequently used, with a usage rate of 72.0%, as shown in Table 5.

Table 5. Distribution of contraceptives used by family planning participants in rural areas of Jambi Province, 2023

Contraceptive Method	Frequency	Percentage
LARC	**56**	**28.0**
Female Sterilization	7	3.5
Implant	44	22.0
IUD	5	2.5
Non-LARC	**144**	**72.0**
Male Condom	10	5.0
1-month injectable	2	1.0
3-month injectable	104	52.0
Pil	28	14.0
Total	200	100.0

Several factors, such as ease of use and accessibility, flexibility and control over contraception, and lower initial costs, might influence the predominant use of non-LARC. The preference for the 3-month injectable among non-LARC methods likely reflects its balance of duration and ease of use, providing a medium-term solution without daily management. Its regular yet infrequent dosing schedule aligns well with the healthcare access rhythms in rural areas (Kavanaugh & Jerman, 2018). The relative popularity of the implant within the LARC category could be attributed to its perceived

reliability, longer duration of effectiveness without daily attention, and lesser degree of invasiveness compared to sterilization (Trussell, 2011).

Knowledge of contraceptives

This study assessed the knowledge of family planning participants in rural Jambi Province regarding various contraceptive methods. Knowledge scores were assigned based on the following criteria: 1 = 'never heard', 2 = 'heard but do not know', and 3 = 'heard and know'. The results indicate that the average knowledge score of family planning participants about contraceptive methods is 2.1, suggesting that while most participants have heard of contraceptives, their detailed knowledge remains limited (Table 6). Limited knowledge can lead to the ineffective or inconsistent use of contraceptives, potentially resulting in unintended pregnancies or discontinuation of the method (Cason et al., 2023).

Table 6. Knowledge of family planning participants about contraceptive methods in rural areas of Jambi Province, 2023

Contraceptive Method/Tool	Distribution Percentage (%)			Total
	Heard and know	Heard but do not know	Never heard	
Female Sterilization/Tubectomy	20.5	31.0	48.5	100.0
IUD	90.5	9.0	.5	100.0
Injection	99.0	1.0	0.0	100.0
Pil	100.0	0	0	100.0
Condom	98.5	1.5	0	100.0
Intravaginal/Diaphragm	0	2.0	98.0	100.0
Emergency Contraception	2.0	20.5	77.5	100.0
Lactational Amenorrhea Method (LAM)	6.5	24.5	69.0	100.0
Periodic Abstinence/Calendar	36.5	37.5	26.0	100.0
Withdrawal	66.5	21.5	12.0	100.0
Implant	78.0	22.0	0.0	100.0
Average knowledge score		2.1		

The highest knowledge scores were recorded for methods such as the pill, IUD, injection, and condom. These methods are likely the focus of current educational programs and are more commonly discussed in public health messages. Their simplicity or the frequency of administration (daily for pills, monthly to yearly for injections, etc.) may also make them easier to understand and remember (Frost et al., 2012; The World Health Organization, 2017). In contrast, the lowest knowledge was observed for intravaginal methods such as diaphragms, indicating a gap in family planning education, possibly due to cultural sensitivities or less prevalent use (Foster & Wynn, 2012; Polis & Curtis, 2013).

Fertility preferences

The fertility preferences among family planning participants in rural areas of Jambi Province show that the average number of living children is 2.0, slightly lower than their ideal number of children at 2.5 (Table 7). This discrepancy could reflect socio-economic conditions, cultural expectations, or access to family planning resources. The fact that 45% of participants have fewer children than they ideally want could indicate issues such as infertility, economic constraints, or previous lack of access to fertility-enhancing resources (Casterline & Sinding, 2000; Greil et al., 2011). Meanwhile, the majority (51.5%) have the number of children they consider ideal, which suggests effective use and satisfaction with family planning services (Cleland et al., 2012; Miller et al., 2004).

Table 7. Percentage of family planning participants according to perceived ideal number of children and number of living children among family planning participants in rural areas of Jambi Province, 2023

Description	Frequency	Percentage
Number of living children < Perceived ideal number of children	90	45.0
Number of living children = Perceived ideal number of children	103	51,5
Number of living children > Perceived ideal number of children	7	3.5
Total	200	100.0
The average perceived ideal number of children	2.5	
The average number of living children	2.0	

Additionally, in terms of the desire to have more children, there is considerable variation among participants. 38.5% expressed a desire for more children, 37.0% stated they did not want more children, and 24.5% were undecided or unsure (Table 8).

Table 8. Desire for more children among family planning participants in rural areas of Jambi Province, 2023

Description	Frequency	Percentage
Want more children	77	38.5
Do not want more children	74	37.0
Undecided/Unsure	49	24.5
Total	200	100.0

Determinants of choosing LARC and non-LARC among family planning participants

The effectiveness of the regression model used to analyze the determinants influencing family planning participants' choices between Long-Acting Reversible Contraceptives (LARC) and non-LARC is summarized in Table 9. The Omnibus Test of Model Coefficients indicates a significant impact of the independent variables on the choice between LARC and non-LARC, with a Chi-Square statistic of 109.8887 and a significance probability (p-value) of 0.000. This suggests that the independent variables collectively affect the decision-making process regarding contraceptive choice.

Furthermore, the Hosmer and Lemeshow test, which assesses the model's goodness-of-fit, yielded a Chi-Square value of 6.989 with a p-value of 0.538. A non-significant Chi-Square result ($p > 0.05$) implies no significant difference between the observed and predicted probabilities, confirming that the model fits the data well.

Table 9. Overall model fit test for determinants of choosing LARC and non-LARC

	Chi-square	df	Sig.
Omnibus Test of Model Coefficients	109.887	13	.000
Hosmer and Lemeshow Test	6.989	8	.538

The 2 x 2 classification table (Table 10) presents the accuracy with which the model predicts the participants' choices of LARC or non-LARC. The overall prediction accuracy is 78.0 percent. Specifically, the model accurately predicts non-LARC choices at a rate of 91.7 percent and LARC choices at 66.1 percent.

Table 10. 2 x 2 classification for determinants of choosing LARC and non-LARC

Observation		Prediction		
		Category		
		Non-LARC	LARC	Percentage Correct
Category	Non-LARC	132	12	91.7
	LARC	19	37	66.1
Overall Percentage				84.5

Table 11 provides coefficient estimates and partial hypothesis testing for the logistic model. In logistic models, coefficients represent the change in the log odds of the dependent variable for a one-unit change in an independent variable. Therefore, the interpretation of these coefficients involves understanding the logit differences. The odds ratio (ψ), calculated as ψ = e^β (where e is the base of the natural logarithm, approximately 2.71828, and β is the coefficient), is used for interpretation.

For categorical independent variables, the odds ratio indicates the difference in the probability/chance between a category and the base category (value 0). An odds ratio less than one indicates a lower probability than the base category, and vice versa for an odds ratio greater than one.

For continuous independent variables, the odds ratio reflects the probability difference between a value and the value one level below it. An odds ratio less than one suggests a lower probability than the level below, and vice versa for an odds ratio greater than one.

Table 11. Parameter estimates for determinants of choosing LARC and non-LARC

		Bootstrap[a]				
	B	Bias	Std.Error	Std.error	Sig.	Exp(B)
X1	.012	.000	.063	.777	.777	1.012
X2(1)	-.824	-.191	.838	.181	.181	.439
X2(2)	-.557	-.076	2.158	.708	.708	.573
X3(1)	-1.859	-.524	1.300	.010	.010	.156
X3(2)	-3.936	-2.319	5.208	.007	.007	.020
X4(1)	1.906	.433	.905	.001	.001	6.728
X4(2)	.552	.018	.778	.356	.356	1.738
X5	.855	.334	.533	.007	.007	2.351
X6	.775	.148	.652	.093	.093	2.170
X7(1)	1.046	.412	1.085	.157	.157	2.847
X7(2)	-1.182	-.276	.924	.084	.084	.307
X8	2.957	.871	1.888	.026	.026	19.238
X9	1.185	.395	.913	.048	.048	3.272
Constant	-11.038	-3.383	5.302	.001	.001	.000

[a.] Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Key findings from Table 11 reveal several insights into the factors influencing women's contraceptive choices between long-acting reversible contraceptives (LARC) and non-LARC. Firstly, the age of women (X1) does not significantly impact their decision, which contrasts with research by Darsono et al. (2020) and Gayatri (2022), who found that age, particularly among women over 35, significantly influences the choice of LARC. Similarly, the education level of women (X2) shows no significant effect on this choice, diverging from findings by Al-Husban et al. (2022) and Azis et al. (2021).

Conversely, the education level of husbands (X3) plays a critical role, where women whose husbands have at least higher secondary education are less likely to choose LARC than those with less educated spouses. This aligns with studies by (Becker et al., 2006; United Nations, 2014). In terms of employment, women working in non-agricultural sectors are more inclined to opt for LARC than homemakers, supporting Dixon-Mueller's (2013) findings. However, no significant differences are observed between women in agriculture and homemakers.

The number of living children (X5) also significantly affects contraceptive choice, with an increase in the number of children raising the likelihood of selecting LARC, corroborated by research from Bankole & Singh, (1998) and Ross & Winfrey (2001). Surprisingly, women who do not desire more children are less likely to choose LARC

than those who want more children or are undecided, which supports findings by Borrero et al. (2009) and Westoff (2006).

Furthermore, a higher knowledge about contraceptives (X8) significantly boosts the probability of opting for LARC, as evidenced in studies by (Dehlendorf et al., 2011; Frost & Darroch, 2008). Lastly, an increase in family income also significantly elevates the likelihood of choosing LARC, which aligns with findings from Averett et al. (2002) and United Nations (2015a). These diverse factors illustrate the complex interplay of personal, economic, and educational elements in contraceptive decision-making.

Determinants of the choice of LARC types

We employed the Pearson and Deviance methods to assess the multinomial logistic regression model's suitability for choosing LARC types. The results of these methods are consolidated in Table 12.

Table 12. The goodness of fit test

	Chi-Square	df	Sig.
Pearson	34.568	84	1.000
Deviance	27.579	84	1.000

The hypotheses tested are:
Ho: The logistic model is suitable for use
H1: The logistic model is not suitable for use.
The testing criteria are:

Reject Ho if the significance value of Pearson/Deviance is less than $\alpha = 0,05$

Accept Ho if the significance value of Pearson/Deviance is greater than or equal to $\alpha = 0,05$.

Based on the results in Table 12, with Chi-Square values of 34.568 for Pearson and 27.579 for Deviance and significance values of 1.00 for both, the decision is to accept H0. This indicates that the model fits well with the data, deeming the logistic model suitable for use.

The significance of the model is further examined by comparing a model without predictor variables (intercept-only model) with a model that includes predictors (final model). The results of this test are presented in Table 13.

Table 13. Model significance test

	Model Fitting Criteria			Likelihood Ratio Tests		
Model	AIC	BIC	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	78.494	82.544	74.494			
Final	83.579	140.288	27.579	46.915	26	.007

Lower values of the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) indicate a better model fit. The decrease in AIC and BIC from the intercept-only model to the final model suggests that adding independent variables improved the model fit. The -2 Log Likelihood also shows a decrease, reinforcing the improved fit. The high Chi-Square value of 46.915 with a significance level of .007 suggests that the final model is significantly better than the intercept-only model.

The model's explanatory power is quantified through the Pseudo R-Square values, calculated using the Cox and Snell, Nagelkerke, and McFadden methods, as shown in Table 14. These values, which adapt the concept of R-squared for use in logistic regression, are relatively high, with Nagelkerke reaching 0.771, indicating that the model adequately explains the variability in the choice of types of LARC. These results

demonstrate the model's robustness in capturing the dynamics influencing the selection of different LARC options within the studied population.

Table 14. Pseudo R-Square

Description	Pseudo R-Square
Cox and Snell	.567
Nagelkerke	.771
McFadden	.630

Furthermore, the multinomial logistic regression analysis presented in Table 15 illustrates the comparative probabilities of selecting different types of Long-Acting Reversible Contraceptives (LARC), specifically comparing the choices of tubectomy and implant against the reference category, intrauterine device (IUD).

Table 15. Parameter estimation for the model of choice of LARC types

Contraceptive used[a]			Bootstrap[a]			Exp(B)
		B	Bias	Std. Error	Sig. (2-tailed)	
Tubectomy	Intercept	-3.849	-491.766[b]	1000.333[b]	.790[b]	
	X1	.103	7.517[b]	11.429[b]	.020[b]	1.109
	X5	6.723	85.195[b]	186.134[b]	.013[b]	831.303
	X6	-5.844	-49.980[b]	143.286[b]	.012[b]	.003
	X8	-6.010	-20.661[b]	290.616[b]	.029[b]	.002
	X9	1.101	-14.619[b]	48.506[b]	.017[b]	3.006
	[X2=1,00]	9.018	83.616[b]	403.642[b]	.589[b]	8246.685
	[X2=2,00]	12.110	13.011[b]	283.298[b]	.417[b]	181711.565
	[X2=3,00]	0[c]	0[b]	0[b]		
	[X3=1,00]	-15.662	-17.119[b]	399.257[b]	.181[b]	1.578E-07
	[X3=2,00]	-16.114	93.657[b]	377.778[b]		1.004E-07
	[X3=3,00]	0[c]	0[b]	0[b]		
	[X4=1,00]	-2.841	-36.257[b]	171.822[b]	.014[b]	.058
	[X4=2,00]	7.457	40.088[b]	141.267[b]	.456[b]	1731.340
	[X4=3,00]	0[c]	0[b]	0[b]		
	[X7=1,00]	-21.534	-32.647[b]	164.395[b]	.188[b]	4.446E-10
	[X7=2,00]	4.297	22.613[b]	225.612[b]	.016[b]	73.481
	[X7=3,00]	0[c]	0[b]	0[b]		
Implant	Intercept	41.765	93.712[c]	571.235[c]	.078[c]	
	X1	.197	6.266[c]	7.618[c]	.004[c]	1.218
	X5	.314	-13.371[c]	81.937[c]	.034[c]	1.369
	X6	-7.350	-31.881[c]	102.110[c]	.011[c]	.001
	X8	-12.196	-119.392[c]	258.896[c]	.008[c]	5.049E-06
	X9	2.631	4.903[c]	29.289[c]	.008[c]	13.888
	[X2=1,00]	-25.514	-83.787[c]	236.247[c]	.188[c]	8.309E-12
	[X2=2,00]	-15.806	-26.223[c]	180.973[c]	.211[c]	1.366E-07
	[X2=3,00]	0[c]	0[c]	0[c]		
	[X3=1,00]	-.256	94.516[c]	297.672[c]	.037[c]	.774
	[X3=2,00]	-13.285	6.285[c]	234.156[c]		1.700E-06
	[X3=3,00]	0[c]	0[c]	0[c]		
	[X4=1,00]	1.459	34.966[c]	93.185[c]	.014[c]	4.302
	[X4=2,00]	23.827	30.852[c]	124.762[c]	.123[c]	22284003745
	[X4=3,00]	0[c]	0[c]	0[c]		
	[X7=1,00]	-2.677	.192[c]	104.709[c]	.008[c]	.069
	[X7=2,00]	-1.443	-50.974[c]	117.377[c]	.011[c]	.236
	[X7=3,00]	0[c]	0[c]	0[c]		

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples
b. Based on 954 samples
c. Based on 951 samples
d. The reference category is: IUD for split file $bootstrap_split = 0.

Model for probability of choosing tubectomy over IUD

From nine variables in the model, only two variables—namely, the wife's education (X2) and the husband's education (X3)—do not influence the decision of family planning participants to choose between tubectomy and IUD. In contrast, the other seven variables show significant influence. Based on positive coefficients and odds ratios greater than one, it is indicated that the older the woman's age (X1), the higher the number of living children (X5), and the higher the income (X9), the greater the likelihood of family planning participants choosing tubectomy over IUD. Conversely, based on negative coefficients and odds ratios less than one, an increase in the difference between the number of living children and the ideal number of children (X6) and the average knowledge score (X8) decreases the likelihood of choosing tubectomy over IUD. The probability of homemakers (X4=1) choosing between tubectomy and IUD is lower than women working in agriculture (X4=3, the base category). However, there is no significant difference in probability between women working in non-agriculture (X4=2) and those in agriculture (X4=3, the base category). The likelihood of family planning participants being undecided about having more children (X7=2) and choosing between tubectomy and IUD is higher than those not wanting more children (X7=3, the base category). However, there is no significant difference in likelihood between PUS wanting more children (X7=1) and those not wanting more (X7=3, the base category).

Model for probability of choosing implant over IUD

From nine variables, only the wife's education (X2) does not influence the decision to choose between an implant and IUD. The other eight variables show significant influence. Positive coefficients and odds ratios greater than one indicate that older women's age (X1), a higher number of living children (X5), higher knowledge scores (X8), and higher income (X9) increase the likelihood of choosing an implant over IUD. Negative coefficients and odds ratios less than one indicate that an increase in the difference between the number of living children and the ideal number (X6) decreases the likelihood of choosing an implant over IUD. The likelihood of family planning participants with husbands having lower secondary education (X3=1) choosing between an implant and IUD is lower compared to those with husbands having higher education (X3=3, the base category). However, there is no significant difference in likelihood between PUS with husbands having upper secondary education (X3=2) and higher education (X3=3, the base category). The probability of homemakers (X4=1) choosing between an implant and IUD is higher than women working in agriculture (X4=3, the base category). However, there is no significant difference in probability between women working in non-agriculture (X4=2) and those in agriculture (X4=3, the base category). Family planning participants wanting more children (X7=1) are less likely to choose an implant over IUD compared to those not wanting more children (X7=3, the base category). Similarly, family planning participants undecided about having more children (X7=2) are less likely to choose an implant over IUD compared to those not wanting more (X7=3, the base category).

CONCLUSION AND RECOMMENDATION

Conclusion

In examining the use of long-acting reversible contraceptives (LARC) among family planning participants in rural areas of Jambi Province, it is apparent that LARC are underutilized, accounting for only 28.0% of total contraceptive use. Implants, emerge as the most commonly used type of LARC, while non-LARC methods such as the 3-month injectable, pills, and male condoms are more predominant with a 72.0% usage rate. Key determinants influencing the choice between LARC and non-LARC

include the education level of the husband, the employment status of the woman, the number of living children, the gap between actual and ideal family sizes, the desire for more children, knowledge about contraceptive options, and family income. Additionally, specific factors such as the woman's age and employment status, as well as the family's income and level of knowledge about contraceptives, significantly relate to the selection of different types of LARC.

Recommendations

Several measures are critical to enhance the effectiveness of contraceptives in managing birth rates:

- Government agencies, particularly the National Population and Family Planning Board (BKKBN), should intensify efforts to promote the use of LARC, focusing on areas with low uptake. Special campaigns can be organized to educate about the benefits and reliability of Tubectomy and IUDs.
- Conduct targeted educational sessions for men to broaden their understanding of contraceptive options and to emphasize the shared responsibility in family planning. This might include community workshops and engaging local leaders to disseminate information.
- Enhance educational resources for women to deepen their knowledge about different types of contraceptives. This is crucial since knowledge significantly impacts contraceptive choices. Interactive sessions, pamphlets, and local health worker outreach could be effective strategies.
- Given that the average perceived ideal number of children for LARC users still exceeds two, there is a need to reinvigorate campaigns like "two children are better." This could involve multimedia advertising, endorsements from local celebrities or respected community members, and testimonials from families who adhere to this family size.
- Improve the availability of LARC in rural healthcare facilities. Ensuring that these contraceptives are readily available and that staff are trained to administer them can help increase their uptake.
- Subsidizing costs or providing LARC free of charge to lower-income families might increase adoption rates among those hesitant due to economic constraints.
- Foster community discussions around family planning to normalize the conversation about contraceptive use and family size preferences. Community forums can be powerful platforms for sharing experiences and overcoming misconceptions about LARC.

By implementing these recommendations, there is a potential to significantly increase the use of LARC, leading to more effective management of birth rates and contributing to the overall well-being and economic stability of families in Jambi Province.

REFERENCES

Al-Husban, N., Kaadan, D., Foudeh, J., Ghazi, T., Sijari, Y., & Maaita, M. (2022). Factors affecting the use of long term and permanent contraceptive methods: a Facebook-focused cross-sectional study. *BMC Women's Health*, *22*(1), 204. https://doi.org/10.1186/s12905-022-01784-0

Aldriana, N. (2015). Faktor-faktor yang Berhubungan dengan Penggunaan Alat Kontrasepsi Dalam Rahim (AKDR) di Wilayah Kerja Puskesmas Kabun Kabupaten Rokan Hulu. *Jurnal Maternity and Neonatal*, *1*(3), 111–122.

Averett, S. L., Rees, D. I., & Argys, L. M. (2002). The impact of government policies and neighborhood characteristics on teenage sexual activity and contraceptive use. *American Journal of Public Health*, *92*(11), 1773-1778.

Azis, R., Mahmud, A., & Arsyad, S. S. (2021). Options of Long-Term Contraceptive Methods in Married Women in South Sulawesi (Analysis of IDHS 2017). *Jurnal Biometrika Dan Kependudukan*, *10*(2), 191-201.

Bankole, A., & Singh, S. (1998). Couples' Fertility and Contraceptive Decision-Making in Developing Countries: Hearing the Man's Voice. *International Family Planning Perspectives*, *24*(1). https://doi.org/10.2307/2991915

Becker, S., Fonseca-Becker, F., & Schenck-Yglesias, C. (2006). Husbands' and wives' reports of women's decision-making power in Western Guatemala and their effects on preventive health behaviors. *Social Science & Medicine*, *62*(9), 2313–2326. https://doi.org/10.1016/j.socscimed.2005.10.006

Bianchi, S. M., & Milkie, M. A. (2010). Work and Family Research in the First Decade of the 21st Century. *Journal of Marriage and Family*, *72*(3), 705–725. https://doi.org/10.1111/j.1741-3737.2010.00726.x

Bongaarts, J., & Casterline, J. (2013). Fertility Transition: Is sub-Saharan Africa Different? *Population and Development Review*, *38*(SUPPL.1). https://doi.org/10.1111/j.1728-4457.2013.00557.x

Borrero, S., Schwarz, E. B., Reeves, M. F., Bost, J. E., Creinin, M. D., & Ibrahim, S. A. (2009). Does vasectomy explain the difference in tubal sterilization rates between black and white women? *Fertility and Sterility*, *91*(5), 1642–1645. https://doi.org/10.1016/j.fertnstert.2008.01.103

BPS. (2021). *Potret Sensus Penduduk 2020*. BPS.

BPS. (2023). *Indikator Kesejahteraan Rakyat Provinsi Jambi Tahun 2023*. BPS.

Budiarti, I., Nuryani, D. D., & Hidayat, R. (2017). Determinan Penggunaan Metode Kontrasepsi Jangka Panjang (MKJP) pada Akseptor KB. *Jurnal Kesehatan*, *8*(2), 220. https://doi.org/10.26630/jk.v8i2.490

Canda, D., Sakung, S., & Yusuf, H. (2015). Hubungan Pengetahuan Dan Dukungan Suami Dengan Pemilihan Metode Kontrasepsi Jangka Panjang Di Kelurahan Lolu Selatan Wilayah Kerjapuskesmas Birobuli. *Jurnal Kolaboratif Sains*, *1*(1), 76–86.

Cason, P., Cwiak, C., Edelman, A., & Kowal, D. (2023). *Contraceptive Technology*. Jones & Bartlett Learning.

Casterline, J. B., & Sinding, S. W. (2000). Unmet need for family planning in developing countries and implications for population policy. *Population and Development Review*, *26*(4). https://doi.org/10.1111/j.1728-4457.2000.00691.x

Cleland, J., Conde-Agudelo, A., Peterson, H., Ross, J., & Tsui, A. (2012). Contraception and health. *The Lancet*, *380*(9837), 149–156. https://doi.org/10.1016/S0140-6736(12)60609-6

Darsono, N. D., Wahyuningsih, S., & Irmarahayu, A. (2020). Factors Influencing the Use of Long-Lasting Contraception Methods among Reproductive-Age Women in Sukmajaya Community Health Care, Depok, West Java. *Childhood Stunting, Wasting, and Obesity, as the Critical Global Health Issues: Forging Cross-Sectoral Solutions*. https://doi.org/10.26911/the7thicph.03.38

Dehlendorf, C., Foster, D. G., de Bocanegra, H. T., Brindis, C., Bradsberry, M., & Darney, P. (2011). Race, Ethnicity and Differences in Contraception Among Low-Income Women: Methods Received By Family PACT Clients, California, 2001–2007. *Perspectives on Sexual and Reproductive Health*, *43*(3). https://doi.org/10.1363/4318111

Dewi, P. H. C., & Notobroto, H. B. (2014). Rendahnya Keikutsertaan Pengguna Metode Kontrasepsi Jangka Panjang Pada Pasangan Usia Subur. *Jurnal Biometrika Kependudukan*, *3*(1), 66–72.

Dixon-Mueller, R. B. (2013). *Rural Women at Work: Strategies for Development in South Asia*. RFF Press. https://doi.org/10.4324/9781315064369

Duze, M. C., & Mohammed, I. Z. (2006). Male Knowledge, Attitudes, and Family

Planning Practices in Northern Nigeria / Connaissance, attitude et pratiques de la planification familiale chez les hommes au Nigéria du nord. *African Journal of Reproductive Health*, *10*(3), 53. https://doi.org/10.2307/30032471

England, P., & McClintock, E. A. (2009). The gendered double standard of aging in US marriage markets. *Population and Development Review*, *35*(4). https://doi.org/10.1111/j.1728-4457.2009.00309.x

Foster, A. M., & Wynn, L. L. (2012). *Emergency Contraception: The Story of a Global Reproductive Health Technology*. Palgrave Macmillan. https://doi.org/10.1057/9781137016485

Frost, J. J., & Darroch, J. E. (2008). Factors Associated with Contraceptive Choice and Inconsistent Method Use, United States, 2004. *Perspectives on Sexual and Reproductive Health*, *40*(2). https://doi.org/10.1363/4009408

Frost, J. J., Lindberg, L. D., & Finer, L. B. (2012). Young Adults' Contraceptive Knowledge, Norms and Attitudes: Associations with Risk Of Unintended Pregnancy. *Perspectives on Sexual and Reproductive Health*, *44*(2), 107–116. https://doi.org/10.1363/4410712

Gayatri, M. (2022). The use of long-acting and permanent contraceptive methods (LAPMs) among women who have completed childbearing in Indonesia: does informed choice matter? *The European Journal of Contraception & Reproductive Health Care*, *27*(1), 28–33. https://doi.org/10.1080/13625187.2021.2008347

Green, W. L. (2005). *Health Education Planning Diagnostik Approach*. The Johns Hapkins University: Mayfield Publishing Company.

Greil, A., Mcquillan, J., & Slauson-Blevins, K. (2011). The social construction of infertility. *Sociology Compass*, *5*(8). https://doi.org/10.1111/j.1751-9020.2011.00397.x

Herlinawati, F. M., & Santosa, H. (2013). Faktor-Faktor yang Berhubungan dengan Pemakaian Kontrasepsi Tubektomi Pada Wanita Pasangan Usia Subur Di RSUD Dr Pirngadi Medan Tahun 2012. *Gizi, Kesehatan Reproduksi Dan Epidemiolog*, *2*(3), 1–10.

Kavanaugh, M. L., & Jerman, J. (2018). Contraceptive method use in the United States: trends and characteristics between 2008, 2012 and 2014. *Contraception*, *97*(1), 14–21. https://doi.org/10.1016/j.contraception.2017.10.003

Kumaladewi, F., & Pelupessy, R. A. (2018). Determinan Pengambilan Keputusan Menjadi Akseptor Kontrasepsi Implan. *Jurnal Ilmiah Kebidanan Indonesia*, *8*(04), 182–190. https://doi.org/10.33221/jiki.v8i04.178

Lewis, J. (2010). Work--family: balance, gender and policy. *Choice Reviews Online*, *47*(08), 47-4739-47–4739. https://doi.org/10.5860/CHOICE.47-4739

Miller, W. B., Severy, L. J., & Pasta, D. J. (2004). A framework for modelling fertility motivation in couples. *Population Studies*, *58*(2). https://doi.org/10.1080/0032472042000213712

Mirawati, M. (2018). Analisis Determinan Yang Berhubungan Dengan Pemilihan Alat Kontrasepsi Oleh Akseptor KB Di PMB Tuti Gambut Kabupaten Banjar Kalimantan Selatan. *Journal of Midwifery and Reproduction*, *2*(1), 31. https://doi.org/10.35747/jmr.v2i1.321

Ningrum, S. S., Indarto, D., & Wijaya, M. (2016). Employment Status, Family Income, Contraceptive Availability, and their Effects on the Use of Long Term Contraceptives in Sukoharjo, Central Java. *Journal of Maternal and Child Health*, *01*(03), 179–187. https://doi.org/10.26911/thejmch.2016.01.03.05

Polis, C. B., & Curtis, K. M. (2013). Use of hormonal contraceptives and HIV acquisition in women: a systematic review of the epidemiological evidence. *The Lancet Infectious Diseases*, *13*(9), 797–808. https://doi.org/10.1016/S1473-3099(13)70155-5

Prawirohardjo, S. (2014). *Ilmu Kebidanan*. Yayasan Bina Pustaka.

Qurniawati, E. (2016). Faktor Determinan Pemakaian Metode Kontrasepsi Jangka Panjang (MKJP). *Warta Bhakti Husada Mulia*, *3*(1), 1–6.

Razavi, S., & Turquet, L. (2016). Progress of the world's women 2015–2016: Transforming economies, realizing rights. *Global Social Policy*, *16*(1), 86–93. https://doi.org/10.1177/1468018115624314

Rizani, R. P. (2019). Determinan Pemilihan Metode Kontrasepsi Jangka Panjang Oleh Wanita Usia Subur Di Desa Beusi Kabupaten Majalengka Tahun 2014. *Jurnal Kesehatan Bidkesmas Respati*, *1*(10), 43–48.

Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). Social Learning Theory and the Health Belief Model. *Health Education Quarterly*, *15*(2), 175–183. https://doi.org/10.1177/109019818801500203

Ross, J. A., & Winfrey, W. L. (2001). Contraceptive use, intention to use and unmet need during the extended postpartum period. *International Family Planning Perspectives*, *27*(1). https://doi.org/10.2307/2673801

Sari, Y. S. N. I., Abidin, U. W., & Ningsih, S. (2019). Faktor - Faktor Yang Berhubungan Dengan Minat Ibu Dalam Pemilihan Alat Kontrasepsi. *J-KESMAS: Jurnal Kesehatan Masyarakat*, *5*(1), 46. https://doi.org/10.35329/jkesmas.v5i1.308

Schwartz, C. R., & Han, H. (2014). The reversal of the gender gap in education and trends in marital dissolution. *American Sociological Review*, *79*(4). https://doi.org/10.1177/0003122414539682

Siperindu. (2023). *Indikator Prevalensi Pemakaian Mkjp Setiap Provinsi*. https://siperindu.online

Sudiarti, E. ., & Kurniawidjaya, L. (2013). *F*aktor-Faktor Yang Berhubungan Dengan Rendahnya Pemakaian Metoda Kontrasepsi Jangka Panjang (MKJP) Pada Pasangan Usia Subur (PUS) Di Puskesmas Jagasatru Kota Cirebon Tahun 2012. *[Thesis]*. Universitas Indonesia.

The World Health Organization. (2017). *Family planning/Contraception: Fact Sheet*. WHO.

Trussell, J. (2011). Medical eligibility criteria for contraceptive use. *Human Fertility*, *14*(3), 203–203. https://doi.org/10.3109/14647273.2011.602520

UNESCO. (2015). *Education for All Global Monitoring Report 2000-2015: Acheivements and Challenges*. UNESCO.

United Nations. (2014). *World Contraceptive Use, 2014*.United Nations

United Nations. (2015a). *Trends in Contraceptive Use Worldwide*. United Nations

United Nations. (2015b). World Fertility Patterns 2015 Data Booklet. *UNESA Publication*.

Upadhyay, U. D., & Karasek, D. (2010). *Women's empowerment and achievement of desired fertility in Sub-Saharan Africa*. The DHS Program

Westoff, C. F. (2006). New Estimates of Unmet Need and the Demand for Family Planning. The DHS Program

Widyastuti, A. H., & Mahmudah, M. (2012). Faktor-Faktor Yang Mempengaruhi Pemilihan Kontrasepsi Suntik Depo Medroksi Progesteron Asetat Di BPS Yacinta Plumbon Tawangmangu. *Maternal*, *7*(7).