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Parity as the Decisive Factor: Predictors of Bilateral Tubal Ligation Choice Among Post-Cesarean Mothers

Dwi Wulandari*, Nova Hikmawati, Iit Ermawati
Universitas Hafshawaty Zainul Hasan, Indonesia

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**Correspondence Address:*
wulandaridwi854@gmail.com

Abstract:
This study aims to determine the association between maternal age, parity, and selection of Female Sterilization (MOW) among mothers who underwent cesarean section at Graha Sehat Hospital, Kraksaan, Probolinggo. MOW is a highly effective permanent contraceptive method; however, its utilization among post-cesarean mothers remains relatively low despite its safety and effectiveness. This study used an observational analytical case-control design with 60 respondents: 30 mothers who selected MOW (case group) and 30 mothers who did not (control group). We selected respondents through simple random sampling from a population of 150 post-cesarean mothers. We collected data from medical records and analyzed them using the Chi-square test. Most respondents were older than 35 years (76.7%), and 66.7% had a parity of three or fewer. Statistical analysis revealed no significant association between maternal age and MOW selection ($p = 0.067$). In contrast, parity was significantly associated with MOW selection ($p = 0.001$), indicating that mothers with higher parity were more likely to choose permanent contraception. These findings highlight parity's importance in contraceptive decision-making. Healthcare providers should strengthen comprehensive counseling regarding the benefits, risks, and permanent nature of MOW to support informed, voluntary, and appropriate contraceptive choices among post-cesarean mothers.

INTRODUCTION

Family Planning (FP) programs are a strategic effort to promote family welfare by regulating birth numbers and spacing (Hafid, 2025; Purnamasari et al., 2025; Ripursari et al., 2025). These programs contribute to improving maternal and child health by ensuring access to contraceptive methods that are safe, effective, and appropriate to individual reproductive needs (World Health Organization, 2025). One highly effective permanent contraceptive method is Female Sterilization (MOW), also known as tubal ligation, a surgical procedure that prevents fertilization by interrupting the fallopian tubes (Bhardwaj & Taneja, 2026; Shoupe, 2026; Zaman et al., 2025). MOW is an appropriate option for women who have reached their desired family size because it is highly effective and has a low failure rate (Schwarz et al., 2022; Mahler et al., 2025; Puspitasari, 2026). Selecting an appropriate contraceptive method after childbirth is particularly important for preventing unintended pregnancies, supporting maternal health, and improving family well-being (Arefadib et al., 2026; Paiandeh et al., 2026; Recker et al., 2025). Therefore, strengthening postpartum family planning services remains an important

public health priority for promoting reproductive health and sustainable community welfare.

Cesarean section (CS) is a surgical procedure performed to deliver a baby through incisions in the abdominal wall and uterus when medically indicated (Alamsyah & Sulastri, 2026; Guner & Karabudak, 2025; Thomaidi et al., 2025). Mothers with a history of cesarean delivery may face increased risks during subsequent pregnancies, depending on their obstetric history and clinical circumstances. Consequently, postpartum contraceptive counseling is an essential component of maternal healthcare, particularly for women who do not intend to become pregnant again (Thomaidi et al., 2025; Bombas et al., 2026; DiCenzo et al., 2025). MOW can be performed concurrently with cesarean delivery when the mother has made an informed and voluntary decision before surgery. This approach may eliminate the need for a separate surgical procedure and its associated recovery period. However, permanent contraception must never be treated as an automatic recommendation based solely on maternal age or parity. Comprehensive counseling is necessary to ensure that women understand available alternatives, potential risks, benefits, and the permanent nature of sterilization before making reproductive decisions.

In Indonesia, contraceptive utilization patterns indicate that permanent methods remain less commonly used than several nonpermanent alternatives. The Indonesian Health Profile identifies injectable contraceptives, pills, implants, and intrauterine devices (IUDs) among commonly used methods, while MOW utilization continues to require attention (Kemenkes RI, 2025). Similarly, the East Java Provincial National Population and Family Planning Board's strategic plan emphasizes strengthening uptake of long-acting and permanent contraceptive methods across districts and cities (Perwakilan BKKBN Provinsi Jawa Timur, 2020). Graha Sehat Hospital in Kraksaan, Probolinggo, provides cesarean delivery and contraceptive services. Hospital records from January 2026 documented 150 mothers undergoing cesarean delivery, with preliminary data indicating that mothers selecting MOW were commonly aged 35 years or older and had more than two children. These circumstances highlight the importance of investigating factors associated with permanent contraceptive selection in local healthcare settings.

Previous studies have identified maternal age and parity as potential determinants of permanent contraceptive choice. Robinet et al. (2023), in a systematic review of postpartum contraceptive selection, identified parity as one of the consistently reported clinical factors influencing decisions regarding permanent contraception. Kalangona et al. (2025) also reported that age and parity were important factors associated with MOW selection, alongside education, knowledge, and husband's support. Similarly, Alifa et al. (2025), in a study conducted at Menteng Mitra Afia Hospital in Jakarta, found associations between maternal age, parity, and sterilization selection, with women aged 35 years or older and those with higher parity more likely to choose sterilization. Nevertheless, findings may vary across healthcare facilities and populations. District hospitals may serve women with different educational backgrounds, counseling experiences, and family influences than urban tertiary hospitals. Therefore, local settings require further investigation into the applicability of previously identified determinants.

Contraceptive decision-making involves more than demographic characteristics, as maternal health status, perceived side effects, contraceptive effectiveness, partner involvement, and personal preferences may also influence method selection. Women's understanding of the benefits, risks, and long-term implications of permanent

contraception may influence their decisions (Gormley et al.,2021; Niemann et al., 2026; Shoma, 2026). Furthermore, shared decision-making enables healthcare providers and patients to discuss available options and align contraceptive choices with individual reproductive goals (Bullington et al., 2022). Although MOW offers highly effective permanent pregnancy prevention, long-acting reversible contraceptives, including levonorgestrel intrauterine devices, provide effective alternatives without permanently limiting fertility (Schwarz et al., 2022). Accordingly, MOW should be presented as one of several contraceptive options rather than an automatic recommendation based on age or parity. This study examines whether maternal age and parity are significantly associated with MOW selection among post-cesarean mothers at Graha Sehat Hospital.

Based on this background, this study aims to determine the association between maternal age and parity and the selection of Female Sterilization (MOW) among post-cesarean section mothers at Graha Sehat Hospital, Kraksaan, Probolinggo. Specifically, the study examines whether maternal age and parity are significantly associated with the decision to undergo MOW. The findings are expected to contribute locally relevant evidence for improving postpartum family planning counseling and supporting healthcare providers in identifying maternal characteristics associated with contraceptive preferences. Importantly, these characteristics should inform counseling priorities without restricting women's access to the full range of contraceptive options. By strengthening evidence-based, balanced, and voluntary decision-making, the study may improve maternal healthcare services, help prevent unintended pregnancies, and promote reproductive autonomy. The findings may also inform future research and service development in district hospitals with similar obstetric and family planning characteristics.

RESEARCH METHODS

This study used a quantitative observational analytical design with a case-control approach to examine the association between maternal age, parity, and selection of Female Sterilization (MOW) among mothers who had undergone cesarean section. The case-control design enabled comparisons between mothers who selected MOW and those who did not, based on their documented characteristics (Dahlan, 2023). The conceptual framework assessed maternal age and parity as independent variables and MOW selection as the dependent variable, consistent with established quantitative research principles (Creswell & Creswell, 2023). The study population comprised 150 mothers who underwent cesarean delivery at Graha Sehat Hospital, Kraksaan, Probolinggo, in January 2026 (Sugiyono, 2022). The required sample size was estimated using Slovin's formula (n=N/(1+Nd^2)), with a population of 150 and a 10% margin of error, yielding 60 respondents. These comprised 30 cases who selected MOW and 30 controls who did not. The study used simple random sampling (Sugiyono, 2022).

Eligible participants were mothers who underwent cesarean delivery at the study hospital during the specified period and had complete medical records documenting maternal age, parity, and MOW selection status. We excluded records with missing or incomplete information on the study variables. We designated maternal age and parity as independent variables, and MOW selection as the dependent variable (Flanagan et al., 2025). Maternal age was categorized as ≤35 years (code 0) and >35 years (code 1). Parity was coded as ≤3 (0) and >3 (1). MOW selection was coded as not selected (0) or selected (1). Maternal age referred to chronological age in completed years at delivery. Parity

referred to the number of previous deliveries resulting in a live birth or stillbirth after 20 weeks of gestation, excluding the current delivery. MOW selection was defined as the documented decision to undergo bilateral tubal ligation concurrently with cesarean delivery. We extracted all variables as categorical data from the medical records.

We collected data retrospectively by reviewing medical records using a structured checklist covering maternal age, parity, and MOW selection status (Nursalam, 2020). Because the checklist extracted existing clinical information rather than measured a latent construct, conventional questionnaire-based validity and reliability testing was not applicable. Data quality was instead supported by standardized extraction procedures and verification against original medical records (Dahlan, 2023). Data collection began after obtaining ethical approval and institutional authorization. We identified eligible records through the hospital's obstetric registry and transferred the relevant variables to the checklist. A second reviewer independently cross-checked a randomly selected 10% subsample against the original records to identify potential transcription errors. The team reviewed and corrected any discrepancies against the source documentation before analysis. We excluded personal identifiers from the analytical dataset and assigned each record a unique study code to maintain confidentiality.

We edited, coded, and tabulated the data, then conducted univariate and bivariate analyses. Univariate analysis summarized categorical variables using frequencies and percentages. In contrast, bivariate analysis examined the associations between maternal age, parity, and MOW selection using contingency tables and the Pearson chi-square test (Dahlan, 2023). Statistical analyses were conducted using IBM SPSS Statistics at a significance level of $\alpha = 0.05$. We calculated odds ratios (ORs) with 95% confidence intervals to estimate the strength of associations. We assessed expected cell frequencies to determine whether the chi-square assumptions were met; we used Fisher's exact test for tables with sparse expected frequencies. The null hypothesis stated that no association existed between each independent variable and MOW selection, whereas the alternative hypothesis stated that an association existed. We defined statistical significance as a p-value below 0.05. We interpreted the direction and magnitude of the associations using the ORs, their confidence intervals, and the corresponding p-values.

The Health Research Ethics Committee of Universitas Hafshawaty Zainul Hasan granted ethical approval under Approval Number 150/KEPK-UNHASA/V/2026, valid from May 1, 2026, to May 1, 2027. The study followed the ethical principles outlined in the CIOMS International Ethical Guidelines for Health-related Research Involving Humans (Council for International Organizations of Medical Sciences [CIOMS], 2016), including scientific and social value, fair selection of participants, assessment of potential risks and benefits, and protection of privacy and confidentiality. Because the study used secondary data from medical records, we accessed and processed the data in accordance with the approved research protocol and institutional requirements. The analytical dataset omitted personal identifying information, and we used coded records throughout the analysis. The research ethics committee determined any applicable requirements regarding consent or a waiver of consent. These procedures were intended to safeguard participant confidentiality and ensure responsible use of clinical information throughout the research process.

RESULTS AND DISCUSSION

Results

This study was conducted at Graha Sehat Hospital, Kraksaan, Probolinggo, from January to June 2026, involving 60 post-cesarean mothers, consisting of 30 respondents in the case group (selected MOW) and 30 in the control group (did not select MOW), drawn from a population of 150 post-cesarean mothers using simple random sampling. All data were obtained through medical record review and were fully collected for all respondents, with no missing data, allowing the data collection and analysis process to be completed as planned.

Respondent characteristics showed that all respondents (100%) were housewives, and nearly half (45%) had completed junior high school (SMP) as their highest level of education. Regarding the specific variables, most respondents (76.7%) were older than 35 years, and nearly half (66.7%) had a parity of ≤ 3. The MOW selection distribution was balanced, with 30 respondents (50%) selecting MOW and 30 (50%) not selecting it. Details of respondent characteristics are presented in Table 1.

The uniformity of occupation across the sample—every respondent identified as a housewife—reflects the broader socioeconomic profile of the catchment population served by Graha Sehat Hospital, where formal employment among women of reproductive age remains limited. This homogeneity in occupational status meant that occupation could not meaningfully function as a comparison variable in this study, and it also suggests that household decision-making dynamics, rather than workplace-related time or financial constraints, are more likely to shape contraceptive decisions in this population. The predominance of junior-high-school-level education (45%), combined with the smaller proportions with elementary (38.3%) and senior-high-school (16.7%) education, further indicates that the population served by this hospital has, on average, a lower level of formal education than urban tertiary-hospital populations described in comparable studies, reinforcing the importance of clear, accessible, non-technical language during MOW counseling sessions.

Table 1. Respondent Characteristics (n = 60)

Characteristic	n	%
Education Level		
Elementary School (SD)	23	38.3
Junior High School (SMP)	27	45.0
Senior High School (SMA)	10	16.7
Occupation		
Housewife	60	100.0
Age		
≤ 35 years	14	23.3
> 35 years	46	76.7
Parity		
≤ 3	40	66.7
> 3	20	33.3
MOW Selection		
Selected MOW	30	50.0
Did Not Select MOW	30	50.0
Total	**60**	**100.0**

The analysis of the correlation between age and MOW selection showed that among respondents aged ≤ 35 years, 4 (28.6%) selected MOW and 10 (71.4%) did not,

whereas among respondents older than 35 years, 26 (56.5%) selected MOW and 20 (43.5%) did not. The Chi-Square test yielded a p-value of 0.067 (p > 0.05), indicating no statistically significant correlation between age and MOW selection, with an odds ratio of 3.25, meaning that respondents older than 35 years had approximately 3.25 times the odds of selecting MOW compared with younger respondents, although this association did not reach statistical significance at α = 0.05 (Table 2). Regarding parity, among respondents with parity ≤ 3, 14 (35%) selected MOW and 26 (65%) did not, while among those with parity > 3, 16 (80%) selected MOW and 4 (20%) did not. The Chi-Square test yielded a p-value of 0.001 (p < 0.05), indicating a statistically significant correlation between parity and MOW selection, with an odds ratio of 7.43, meaning that respondents with parity greater than 3 had approximately 7.43 times the odds of selecting MOW compared with respondents with parity of 3 or fewer (Table 3).

Table 2. Correlation Between Age and MOW Selection Among Post-Cesarean Section Mothers

Age	Case n (%)	Control n (%)	Total n (%)	p-value
≤ 35 years	4 (28.6)	10 (71.4)	14 (100)	
> 35 years	26 (56.5)	20 (43.5)	46 (100)	0.067
Total	**30 (50.0)**	**30 (50.0)**	**60 (100)**	

Table 2 presents the association between maternal age and selection of female sterilization (MOW) among 60 post-cesarean mothers. Among respondents aged ≤35 years, 4 (28.6%) in the case group selected MOW, while 10 (71.4%) in the control group did not. In contrast, among mothers aged >35 years, 26 (56.5%) selected MOW, compared with 20 (43.5%) who did not. These descriptive findings indicate that MOW selection was proportionally more frequent among mothers older than 35 years. However, the Chi-square test showed no statistically significant association between maternal age and MOW selection (\(p = 0.067\)), as the p-value exceeded the significance threshold of 0.05. Therefore, we cannot reject the null hypothesis. Although the observed distribution suggests a possible relationship between older maternal age and MOW selection, the evidence is insufficient to establish a statistically significant association in this sample. This finding may indicate that age alone does not adequately explain contraceptive decision-making, which may also involve reproductive intentions, perceived risks, partner support, knowledge, and preferences for alternative contraceptive methods. However, this study did not directly examine these potential explanations. Further research involving larger samples and multivariable analysis is needed to clarify the independent association between maternal age and MOW selection.

Table 3. Correlation Between Parity and MOW Selection Among Post-Cesarean Section Mothers

Parity	Case n (%)	Control n (%)	Total n (%)	p-value
≤ 3	14 (35.0)	26 (65.0)	40 (100)	
> 3	16 (80.0)	4 (20.0)	20 (100)	0.001
Total	**30 (50.0)**	**30 (50.0)**	**60 (100)**	

Table 3 shows the association between parity and MOW selection among post-cesarean mothers. Among respondents with parity ≤3, 14 (35.0%) selected MOW, whereas 26 (65.0%) did not. Conversely, among mothers with parity >3, 16 (80.0%) selected MOW, while only 4 (20.0%) did not. This distribution indicates a substantial difference in MOW selection between the two parity groups, with a higher proportion of

selection among mothers with parity >3. The Chi-square test demonstrated a statistically significant association between parity and MOW selection (\(p = 0.001\)). Accordingly, we rejected the null hypothesis of no association. The reported odds ratio of 7.43 further suggests that mothers with parity >3 had approximately 7.43 times the odds of selecting MOW compared with mothers with parity ≤3, assuming the odds ratio was calculated using these categories as specified. This finding supports the importance of reproductive history and perceived family completion in contraceptive decision-making. However, parity should not be interpreted as the sole determinant of MOW selection, because individual reproductive preferences, counseling experiences, partner support, and cultural considerations may also influence decisions. Moreover, the association does not establish causality. These findings support the integration of individualized, balanced contraceptive counseling into antenatal and preoperative care, particularly for mothers with higher parity, while ensuring that MOW remains a voluntary and informed choice.

The distinct magnitude of these two associations is synthesized in Figure 1, which displays the odds ratio for each variable as a bar plotted against a common reference line (OR = 1, indicating no association).

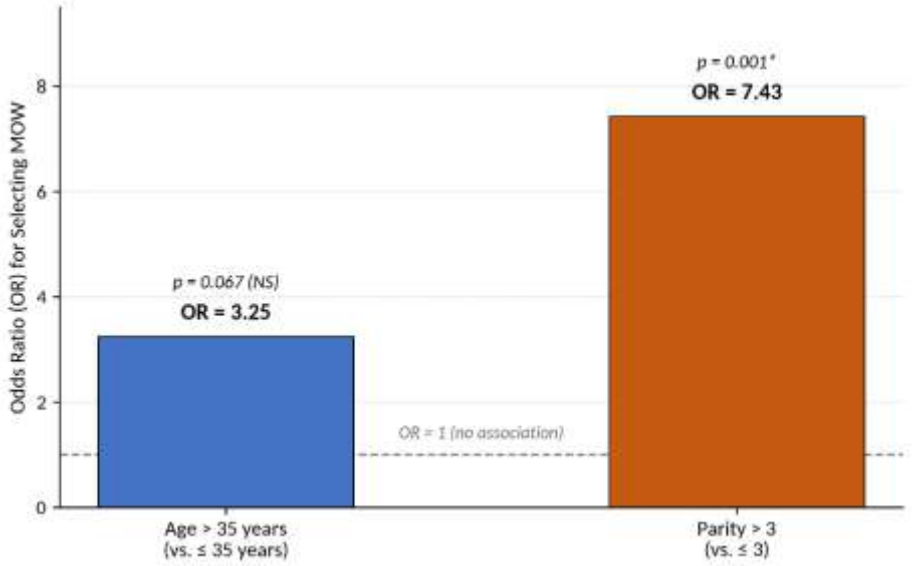


Figure 1. Comparison of Odds Ratios for Age and Parity in Relation to MOW Selection

Figure 1 compares the odds ratios (ORs) for maternal age and parity for selection of female sterilization (MOW) among post-cesarean mothers. Maternal age>35 years was associated with higher odds of MOW selection than age ≤35 years (OR = 3.25), although this association was not statistically significant (p = 0.067). In contrast, parity above three was associated with 7.43 times the odds of MOW selection compared with parity ≤3, and this association was statistically significant (p = 0.001). The dashed horizontal line at OR = 1 represents the reference value indicating no association. Although both estimates exceed this reference, parity demonstrates a larger observed effect estimate and stronger statistical evidence of an association with MOW selection than maternal age. These findings suggest that parity may be a more relevant correlate of permanent contraceptive selection in this study population. However, interpret the comparison cautiously because the odds ratios represent different characteristics, and the figure does

not show their 95% confidence intervals. Including confidence intervals would provide a clearer assessment of each estimate's precision and uncertainty.

Table 4. MOW Selection by Education Level Among Post-Cesarean Mothers

Education Level	Case n (%)	Control n (%)	Total n (%)	% Selecting MOW
Elementary School (SD)	10 (43.5)	13 (56.5)	23 (100)	43.5
Junior High School (SMP)	14 (51.9)	13 (48.1)	27 (100)	51.9
Senior High School (SMA)	6 (60.0)	4 (40.0)	10 (100)	60.0
Total	**30 (50.0)**	**30 (50.0)**	**60 (100)**	**50.0**

Table 4 presents the distribution of Female Sterilization (MOW) selection according to educational attainment among 60 post-cesarean mothers. The proportion selecting MOW increased gradually across educational categories, from 43.5% among mothers with elementary education (10 of 23 respondents) to 51.9% among those with junior high school education (14 of 27 respondents) and 60.0% among those with senior high school education (6 of 10 respondents). Conversely, the proportion of mothers who did not select MOW decreased from 56.5% in the elementary education group to 40.0% in the senior high school group. This descriptive pattern suggests a possible relationship between educational attainment and permanent contraceptive selection. Higher education may be associated with greater access to reproductive health information and a better understanding of contraceptive options; however, the present study did not directly assess these mechanisms, so they remain potential explanations rather than established findings.

Interpret these findings cautiously because Table 4 presents descriptive data without reported statistical significance tests or adjustment for potential confounders. The observed differences do not establish whether education is independently associated with MOW selection or whether other characteristics, such as maternal age, parity, socioeconomic circumstances, contraceptive knowledge, or partner support, drive the pattern. Furthermore, the relatively small number of respondents in the senior high school category limits the precision of comparisons across educational groups. Nevertheless, the results highlight the importance of considering educational diversity when designing postpartum family planning counseling. Healthcare providers should communicate MOW information in accessible language, ensure mothers with different educational backgrounds understand its benefits, risks, permanence, and available alternatives, and support voluntary, informed decision-making. Future studies with larger samples and multivariable analyses are needed to determine whether educational attainment contributes independently to MOW selection among post-cesarean mothers.

Discussion

This study provides insight into the association between maternal age, parity, and the selection of Female Sterilization (MOW) among post-cesarean mothers at Graha Sehat Hospital, Kraksaan, Probolinggo. Most respondents were older than 35 years (76.7%), while 66.7% had a parity of three or fewer. These characteristics provide important context for understanding contraceptive decision-making within this hospital population. Women of advanced maternal age may require more comprehensive counseling regarding pregnancy-related risks and available contraceptive options. In East Java, family planning strategies emphasize increasing use of long-acting and permanent

contraceptive methods as part of reproductive health services (Perwakilan BKKBN Provinsi Jawa Timur, 2020). Similarly, national health data highlight the importance of improving access to appropriate contraceptive methods in Indonesia (Kemenkes RI, 2025). Nevertheless, the relatively high proportion of mothers older than 35 years in this study may not represent the general obstetric population, as the hospital's referral characteristics and the inclusion of post-cesarean mothers may influence the observed age distribution.

Maternal age was not significantly associated with MOW selection in this study ($p = 0.067$; OR = 3.25). Although the odds ratio suggests a potentially meaningful association, the p-value did not meet the prespecified significance threshold of 0.05. Therefore, the findings do not provide sufficient statistical evidence to conclude that maternal age was associated with MOW selection in this sample. This result may indicate that chronological age alone does not adequately explain women's decisions regarding permanent contraception. Other considerations, including reproductive intentions, perceived procedural risks, partner support, contraceptive knowledge, and preferences for alternative methods, may also influence decision-making. Gormley et al. (2021) and Zaman et al. (2025) demonstrated that the choice of permanent contraception involves considerations of effectiveness, safety, and available alternatives. Similarly, Alifa et al. (2025) identified factors beyond age, including knowledge, husband's support, and consideration of alternative contraceptive methods, as relevant to sterilization selection. However, the present study did not directly measure these factors; therefore, their potential contribution should be interpreted as requiring further investigation rather than as an established explanation for the observed result.

In contrast, parity was significantly associated with MOW selection ($p = 0.001$; OR = 7.43). The descriptive findings indicated that mothers with parity greater than three selected MOW more frequently than those with parity of three or fewer, with corresponding proportions of 80% and 35%, respectively. This pattern suggests that the number of children a mother has may be an important correlate of decisions concerning permanent contraception. Robinet et al. (2023), in a qualitative systematic review of postpartum contraceptive choice, identified parity and the perceived completion of family size as recurring considerations in contraceptive decision-making. Kalangona et al. (2025) likewise reported that parity was an important factor associated with MOW selection, alongside other individual and social determinants. These findings are broadly consistent with the present study, in which parity demonstrated a statistically significant association while age did not. Nevertheless, parity should not be interpreted as a direct measure of a woman's intention to stop childbearing. Decisions regarding permanent contraception remain individual, and the association observed in this study does not establish that higher parity causes women to select MOW.

The difference between the age and parity findings is particularly relevant when interpreted alongside international evidence on contraceptive choice. Gormley et al. (2021) reviewed permanent contraception options for women in high-resource settings, while Schwarz et al. (2022) compared the effectiveness and safety of intrauterine contraception and tubal ligation. Their findings highlight the importance of considering the comparative benefits, risks, and reversibility of available contraceptive methods when supporting women's decisions. Robinet et al. (2023) further demonstrated that postpartum contraceptive choice reflects multiple interacting considerations, including reproductive intentions and perceptions of family completion. Taken together, this

literature provides a useful framework for understanding why parity may be more strongly associated with MOW selection than age in the present study. However, when comparing results across populations, consider differences in healthcare settings, cultural contexts, counseling practices, and study designs. These findings provide context-specific evidence from a district hospital in Indonesia, but they cannot establish whether the observed pattern applies to other facilities or populations nationally.

The findings have practical implications for postpartum family planning services. Because parity was significantly associated with MOW selection, healthcare providers may consider incorporating reproductive history and intended family size more explicitly into contraceptive counseling. However, parity should guide the content of counseling rather than determine eligibility or create pressure to accept permanent contraception. Consistent with the shared decision-making approach discussed by Bullington et al. (2022), counseling should provide balanced information about MOW, its permanent nature, potential benefits and risks, and available reversible alternatives. Midwives and obstetricians should start these discussions early in antenatal care to give women enough time to consider their options and share their preferences. Standardized counseling protocols and staff training may improve the consistency and quality of contraceptive information delivered across clinical encounters. At the institutional level, periodic evaluation of counseling practices could help identify gaps in information provision and support improvements in postpartum family planning services. However, the effectiveness of these proposed interventions requires evaluation in subsequent implementation studies.

Several strengths and limitations should inform interpretation of these findings. The case-control design allowed comparison of maternal characteristics between women who selected MOW and those who did not, while medical records reduced reliance on retrospective self-reports of age and parity. Nevertheless, the study was conducted at a single hospital and included only 60 respondents, limiting the precision of the estimated associations and the generalizability of the findings. The retrospective design also prevents causal conclusions regarding the relationship between maternal characteristics and contraceptive selection. Furthermore, the analysis excluded potentially important variables, including educational attainment, husband's support, religious and cultural beliefs, contraceptive knowledge, socioeconomic circumstances, and previous contraceptive experience. Although the association between parity and MOW selection was statistically significant, the reported odds ratio should be interpreted alongside its confidence interval to reflect estimation precision. Future research should use larger, multicenter samples and multivariable analyses to assess the independent associations of maternal age and parity while accounting for potential confounders. Qualitative studies could also explore women's experiences, reproductive preferences, and counseling needs to inform culturally responsive and evidence-based family planning services in Indonesia.

CONCLUSION

This study concludes that maternal parity was significantly associated with selection of female sterilization (MOW) among post-cesarean mothers at Graha Sehat Hospital, Kraksaan, Probolinggo ($p = 0.001$; OR = 7.43), whereas maternal age was not statistically significant ($p = 0.067$; OR = 3.25). These findings suggest that parity may be an important correlate of permanent contraceptive decision-making within the study

population. Accordingly, healthcare providers and hospital administrators are encouraged to strengthen postpartum family planning services by integrating structured, evidence-based, and noncoercive contraceptive counseling into antenatal and preoperative care. Counseling should address reproductive intentions, parity, individual preferences, potential benefits and risks, and alternative contraceptive methods to support informed and voluntary decisions. Midwives, obstetricians, and family planning counselors should receive appropriate training to ensure consistent counseling practices, while healthcare facilities should periodically evaluate counseling quality and contraceptive service delivery. Community health workers may also support these efforts by providing accurate reproductive health information and facilitating referrals to qualified healthcare professionals. However, interpret the findings cautiously because the study used a relatively small sample from a single hospital and did not account for potential confounding variables. Future research should use larger, multicenter samples and multivariable analyses to examine the independent associations of maternal age and parity while accounting for educational attainment, partner support, religious beliefs, socioeconomic characteristics, and prior contraceptive experience. Further qualitative research could explore mothers' perceptions, reproductive preferences, and decision-making experiences to understand MOW selection better and inform context-sensitive improvements in postpartum family planning services across Indonesia.

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CONFLICTS OF INTEREST

The authors declare that there is no financial, personal, or institutional conflict of interest related to the conduct or reporting of this study.

USE OF ARTIFICIAL INTELLIGENCE (AI)-ASSISTED TECHNOLOGY

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