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Binomial Logistic Regression of Contraceptive Use among Indonesian Multiparous Women: Indonesia Health Survey 2023

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ABSTRACT

Family planning (KB) is an important strategy to reduce maternal mortality by reducing the number of pregnancies and the proportion of high-risk pregnancies, while enabling family planning. Although data from the Central Statistics Agency (BPS) shows fluctuations, the prevalence of active KB participation in Indonesia is not enough to significantly increase contraceptive use, especially in multiparous women. The purpose of this study was to examine the factors that influence contraceptive use in Indonesian multiparous women. This finding provides valuable insight for designing targeted family planning programs for multiparous women. The study design was cross-sectional using secondary data obtained from the 2023 Indonesian Health Survey (SKI). The analysis focused on data from 14,975 multiparous mothers who had filled out the questionnaire. The dependent variable in this study was contraceptive use. Independent variables included age, education level, occupation, insurance ownership, delivery method, pregnancy risk, and history of labor and postpartum complications. Data were analyzed using binomial logistic regression. The results of the study showed that determinant factors such as education level, occupation, delivery method, and history of delivery complications affected the use of contraceptives in multiparous women in general by only 3.1%, while 96.9% were influenced by other factors not included in this model test. Targeted interventions are very important, including expanding contraceptive education for highly educated women and increasing flexible access to services for informal sector workers, as well as conducting counseling programs especially for women with a history of surgery or delivery with complications, to ensure optimal use of contraceptives.

Keywords *: Binomial Logistic Regression; Contraceptive Use; Multiparous Women*

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INTRODUCTION

Maternal mortality remains a significant global and regional challenge in reproductive health, with Indonesia's Maternal Mortality Rate (MMR) notably higher compared to many other ASEAN countries. (1) Globally, the situation is critical, with the United Nations International Children's Emergency Fund (UNICEF) reporting 712 daily maternal deaths from pregnancy-related complications, equating to one death every two minutes. A key strategy to accelerate the reduction of these figures is the implementation of Family Planning (KB) programs. The primary goal of these programs is to decrease maternal mortality by reducing the total number of pregnancies and lowering the proportion of high-risk pregnancies. Furthermore, KB helps couples plan family size, regulate birth spacing, and improve their overall quality of life. (2–5) Despite its importance, the prevalence of active family planning participation in Indonesia has fluctuated over the last five years, per data from Badan Pusat Statistik (BPS), ranging from 55.06% to 56.04%. (6) Although the number of users has increased slightly, this trend has not been sufficient to significantly boost contraceptive use, particularly among multiparous women (women who have given birth more than once). This is a major concern, as multiparity is a proven adverse risk factor during pregnancy, labor, and the postpartum period. (7–10)

Studies, including one in Eastern Anatolia and another in Sidama State, Ethiopia, consistently show that multiparous mothers are at a higher risk for serious complications, such as postpartum hemorrhage, antepartum hemorrhage, anemia, and malpresentation. Therefore, for effective population control and to mitigate these obstetric risks, it is imperative for women desiring larger families to meticulously prioritize and utilize family planning and comprehensive antenatal care. (11–14) The objective of this study is to examine the factors that influence contraceptive use among multiparous women in Indonesia. The analysis will utilize a binomial logistic regression model to identify factors that contribute to contraceptive use.

METHODS

This study is a secondary data analysis based on the 2023 Indonesian Health Survey (IHS) conducted by the Indonesian Ministry of Health. The IHS employed a cross-sectional design and was conducted at the national level, encompassing households in 34 provinces, 416 districts, and 98 cities in Indonesia. The analysis focused on data from 14.975 multiparous mothers who completed the questionnaire. The research instruments and data collection procedures were executed in accordance with the SKI 2023 standard protocol, employing structured questionnaires administered through interviews and physical measurements obtained by the SKI research team.

The dependent variable in this study was contraceptive use. The independent variables encompassed age, categorized as 20-35 years old and age <20 or >35 years old; education level, categorized as no school, primary, secondary, and higher education; occupation, categorized as not working, working in the non-formal sector and formal sector; insurance ownership, categorized as non-JKN and JKN; delivery method, categorized as unassisted and assisted delivery; risk in pregnancy, categorized as risk and no risk; and history of complications in childbirth and postpartum, categorized as history and no history. The analysis employed the binomial logistic regression method with a proportional odds model to assess the relationship between contraceptive use in multiparous women and its associated factors, including age, education, employment, insurance ownership, delivery method, pregnancy risk, history of complications in childbirth, and postpartum.

RESULTS

Based on univariate, bivariate and multivariate analysis, the following results were obtained:

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Table 1. Bivariate Analysis of Determinant Factors on the Use of Contraceptive Devices in Multiparous Women in Indonesia

Category	Use of Contraceptives				P-value
	Yes		No		
	n	%	n	%	
Age					
20-35 Tahuh	9341	73.8	3311	26.2	0.383
<20 and >35 Tahun	5634	74.4	1939	25.6	
Education					
No Education	828	76.6	253	23.4	<0.0001
Primary	2682	78.9	716	21.1	
Secondary	8838	75.1	2938	24.9	
Higher	2627	66.2	1343	33.8	
Maternal Occupation					
Not Working	8980	76.3	2797	23.7	<0.0001
Working in Non Formal Sector	1942	69.4	855	30.6	
Working in Sector Formal	4053	71.7	1598	28.3	
Insurance Ownership					
Non NHI	218	72.4	83	27.6	0.563
NHI	14757	74.1	5167	25.9	
Delivery Method					
Unassisted Delivery	10645	73.6	3810	26.4	0.042
Assisted Delivery	4330	75.0	1440	25.0	
Pregnancy Risks					
No	12150	74.0	4271	26.0	0.744
Yes	2825	74.3	979	25.7	
History of Childbirth Complications					
Yes	3063	76.1	960	23.9	0.001
No	11912	73.5	4290	26.5	
History of Postpartum Complicatios					
Yes	1154	73.9	407	26.1	0.938
No	13821	74.1	4843	25.9	

Source: Secondary data from SKI (2023)

Table 1 shows that there is a significant relationship between education level (P_{value} =0.0001), maternal occupation (P_{value} =0.0001), delivery method (P_{value} =0.042) and history of complications in childbirth P_{value} =0.001) with the use of contraceptives in multiparous

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women in Indonesia. Meanwhile, reproductive age (P_{value} =0.383), employment status (P_{value} =0.146), health insurance ownership (P_{value} =0.563), risk factors in pregnancy (P_{value} =0.744), and history of complications during postpartum (P_{value} =0.938) did not show a significant relationship with the use of contraceptives in multiparous women in Indonesia.

Table 2. Final Modeling of Logistic Regression Analysis Results

Variable	B	df	P_{value}	Exp(B)	CI 95%	
					Lower	Upper
Constant	1.174	1	<0.0001	3.236		
Age 20-35	0.027	1	0.418	1.028	0.962	1.098
Primary Education	0.129	1	0.112	1.138	0.966	1.340
Secondary Education	-0.102	1	0.176	0.903	0.779	1.047
Higher Education	-0.521	1	<0.0001	0.594	0.505	0.698
Working in Non Formal Sector	-0.080	1	0.131	0.923	0.831	1.024
Working in Sector Formal	-0.198	1	<0.0001	0.820	0.763	0.882
Non NHI Insurance Ownership	0.024	1	0.853	1.025	0.793	1.325
No Risks in Pregnancy	-0.021	1	0.619	0.979	0.900	1.065
Assisted Delivery	0.103	1	0.010	1.109	1.025	1.199
Have Complications history of Childbirth	-0.112	1	0.016	0.894	0.817	0.979
Have Complications history of Postpartum	0.048	1	0.430	1.050	0.931	1.184

Furthermore, other factors that have been shown to have a significant influence are higher education, assisted delivery, and respondent who have complicatons history of postpartum. The findings of this study indicate that multiparous women with higher levels of education exhibit a 40.6% lower risk compared to those who did not attend school (PR = 0.594, 95% CI [0.505; 0.698], P_{value} = 0.0001), Multiparous women employed in the formal sector exhibit a 18% reduced risk compared to mothers engaged in work within the informal sector (PR = 0.820, 95% CI [0.763; 0.882], P_{value} = 0.0001), women who gave birth with the assistance of health workers exhibited a 10.9% higher probability of utilizing contraception compared to those who gave birth without such assistance (PR = 1.109, 95% CI [1.025; 1.199], P_{value} = 0.010), and multiparous women with a history of complications during childbirth exhibited a 10.6% lower risk of using contraception compared to those

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without a history of complications during childbirth 0.894, 95% CI [0.817; 0979], P_{value}=0.016). The binomial logistic regression equation with its threshold is as follows:

Logit (Y) = 1.174_{y} +0.072_{x1} +0.129_{X2} -0.102_{X3}-0.521_{x4}-0.080_{x5}-0.198_{x6}+0.024_{x7} -0.021_{x8} +0.103_{x9} -0.112_{x10} +0.048_{x11}

Table 3. Model Fit Test

Goodness-of-Fit			Nagelkerke R^2
Chi-Square	df	Sig.	
4.999	8	0.758	0.031

Table 3 shows the results of the model fit test indicating that the model has a good fit with the data, based on the high chi-square (P_{value} = 0.758). However, the low nagelkerke R^2 value (3.1%) indicates that the model only explains a little of the variation in the data. This means that determinant factors such as reproductive ages, education level, employment insurace ownership, risk in pregnancy, delivery method, history of complications in labor and postpartum affect the use of contraceptives in multiparous women in general by only 3.1% while 96.9% is influenced by other factors not included in this model test.

DISCUSSION

Maternal mortality in Indonesia remains a significant public health concern. High rates of maternal mortality point to systemic issues with maternal and newborn health services, adversely impacting the physical, psychological, and social well-being and development of infants and toddlers. The global burden of maternal mortality is predominantly attributable to complications arising from pregnancy, childbirth, and the postpartum period. A multitude of studies have indicated that multiparous women are associated with an elevated risk of complications during pregnancy and childbirth. Consequently, multiparous women are categorized as a high-risk group in clinical practice. (15,16)

Education level is frequently associated with contraceptive utilization. A substantial body of research has demonstrated a robust correlation between the educational attainment of women and their utilization of contraceptive methods. (17,18) Specifically, findings have indicated that women with lower levels of education exhibit a lower propensity to employ contraceptive techniques in comparison to their more educated counterparts. This suggests a positive correlation between higher educational attainment and increased rates of contraceptive use. (19,20)

Contrary to the findings of previous studies, the results of this investigation suggest that the proportion of contraceptive use is higher among respondents who have not attended school compared to those with higher education. This result may be inconsistent with broader research findings, and its implications may be explained by several factors. For instance, this discrepancy may be attributable to variations in access to and availability of information regarding contraceptive methods. Individuals with limited education levels are often the primary targets of health and family planning education in their respective communities. Moreover, government initiatives have deliberately focused on providing free or subsidized contraceptive information and access to this demographic group, which may not be as comprehensive as that provided to the highly educated group, who are considered to have sufficient access to information. This increased access is further bolstered by the implementation of JKN, a comprehensive national health insurance scheme designed to achieve universal health coverage (UHC). A multitude of publications have indicated that JKN has been effective in reducing health disparities and significantly increasing access to services for its population, including family planning (KB) services. (21–24)

In addition to educational attainment, one's employment status exerts a significant influence on the utilization of contraceptive methods. A previous employment status has been demonstrated to be associated with the use of contraceptives among women of reproductive age. (25) The utilization rate was found to be higher among employed women

compared to their unemployed counterparts. This phenomenon is partly attributable to the autonomy and decision-making capacity of employed women, as well as the potential for augmented financial independence and access to resources. (26)

The findings of the study indicated that the proportion of contraceptive use was higher among respondents who were not employed compared to those who were employed in the formal sector. This finding aligns with the results observed in Surabaya, which indicated that mothers engaged in formal sector employment exhibited reduced engagement in health education initiatives. (27) It has been demonstrated that respondents who are employed within the formal sector have restricted access to information regarding contraceptives. Conversely, respondents who are not employed may have greater availability to visit health facilities or participate in family planning counseling programs. The flexibility in scheduling that these services offer, which is not bound by a strict formal work schedule, facilitates more convenient access to appointments, educational sessions, and contraceptive services. (26)

Conversely, individuals engaged in formal sector employment may encounter constraints in terms of time, the complexity of obtaining authorization from their place of work, or elevated transportation expenses when attempting to access family planning services during their working hours. This assertion is corroborated by research findings that indicate mothers who are not engaged in paid employment possess greater autonomy in terms of scheduling, enabling them to attend health facilities with greater frequency. This is in contrast to mothers who are employed in formal or informal sectors, where constraints on their time and availability may hinder their ability to engage regularly with healthcare services. (28)

The present study found that complications in labor (P_{value} =0.016; OR=0.894) and surgical delivery (P_{value}=0.010; OR=1.109) were significantly associated with the use of contraceptives in multiparous women compared to normal or non-surgical delivery. A

study conducted at Panembahan Senopati Bantul Yogyakarta Hospital, Indonesia, demonstrated that mothers who underwent cesarean sections were 1.5 times more likely to utilize contraception compared to those who gave birth vaginally. (29)

Operative childbirth is frequently linked to heightened pain intensity, an extended and more arduous recovery period, and an augmented likelihood of postpartum complications in comparison to vaginal delivery. It is plausible that these traumatic or difficult experiences during childbirth motivate women to actively seek and use contraceptive methods to avoid future pregnancies. (30,31) This allows their bodies to fully recover and reduces the risk of difficult deliveries in the future. Furthermore, health care professionals may adopt a more proactive stance in offering postpartum contraceptive counseling to women who undergo operative delivery, given the necessity for adequate pregnancy breaks to ensure optimal maternal and child health. (32,33) Consequently, these findings underscore the significance of the quality and experience of childbirth as crucial factors in the adoption of contraceptives among multiparous women, thereby emphasizing the necessity for comprehensive support for postpartum mothers.

CONCLUSIONS AND RECOMMENDATIONS

The present study revealed that education level, type of employment, mode of delivery, and history of complications during delivery have significant impacts on contraceptive use among multiparous women. Consequently, targeted interventions are imperative, encompassing the expansion of contraceptive education for highly educated women and the augmentation of flexible access to services for informal sector workers. Furthermore, the integration of postpartum Family Planning (FP) counseling programs is imperative, particularly for mothers with a history of surgical or complicated deliveries, to ensure the optimal use of contraceptives

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