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MATERNAL INFANT HEALTH SERVICES AND MODERN CONTRACEPTIVE USE AMONG POSTPARTUM WOMEN IN INDONESIA

Eva Dian Kusumastuti[1], Prima Dhewi Ratrikaningtyas[2], Bayu Satria Wiratama[2]
[1,2,3]Department of Biostatistics, Epidemiology, and Population Health, Faculty of Medicine, Public Health, and Nursing, Gadjah Mada University, Yogyakarta, Indonesia
Corresponding Email: evadiankusumastuti@mail.ugm.ac.id

ABSTRACT
Reproductive-age women require effective methods to control the timing of their births and limit the number of children they have. This requirement can be achieved by using modern postpartum contraceptive methods that are provided through maternal and infant health services. This study examined the link between maternal-infant health services and modern contraceptive use among postpartum women aged 15-49, using 2017 Indonesia Demographic and Health Survey (IDHS) data from 6,309 women. A cross-sectional design and logistic regression analyses revealed a positive association: women receiving comprehensive maternal and infant health services were 1.5 times more likely to use modern contraceptives. Other significant factors included education, income, marital status, number of children, pregnancy and delivery services, sexual activity, internet use, family planning discussions, and information from healthcare providers. To improve contraceptive access, BKKBN should strengthen infrastructure, skills training, and field worker coordination. The Ministry of Health should enhance field evaluations of integrated maternal and infant health contraceptive services.

Keywords: maternal infant health services; modern contraceptives; postpartum women.

INTRODUCTION

The use of quality postpartum contraception and low discontinuation rates are associated with a continuum of maternal health services. Prenatal care services provide an opportunity to promote modern contraceptive use, especially postpartum. (Do & Hotchkiss, 2013; Negash et al., 2022). Previous literature indicates that women who receive adequate care during pregnancy and integrated maternal and infant care are more likely to maintain an interpregnancy interval of 60 months or more. (Sonalkar et al., 2014).

Women who have continuous antenatal visits, give birth in a hospital, and receive postpartum care have a positive correlation with postpartum contraceptive use. Contraceptive use significantly increases if a woman has at least three antenatal visits and returns to the health center for postpartum care within two weeks after giving birth. Maternal health services contribute to women's trust in the healthcare system and their satisfaction with care, thereby increasing their likelihood of using family planning services. (Bansal et al., 2022; Dixit et al., 2017).

Modern contraceptive methods are known to be more effective than traditional methods. (Polis et al., 2016). In developing countries, modern contraception can prevent approximately 308 million unintended pregnancies each year. Modern contraception can also reduce maternal and infant mortality rates and lower the risk of contracting sexually transmitted infections. (Darroch et al., 2017; Negash et al., 2022).

Corresponding Email:
evadiankusumastuti@mail.ugm.ac.id
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At least 77% of reproductive women in Indonesia (15-49 years old) received antenatal care from healthcare providers at least four times. Seventy-four percent of live births occurred in healthcare facilities. Eighty-seven percent of women who gave birth received postpartum care within the first. Two days, and 79% of newborns underwent a health check within the first two days after birth (IDHS, 2018). Analysis of IDHS data from 2007 and 2012, as well as the Performance Monitoring Accountability (PMA) 2020 survey, indicates that contraceptive use during the postpartum period was relatively high, with over 74% of postpar

tum mothers reporting contraceptive use at the time of the study. However, of that number, only 50% of the mothers started using contraception within six months after delivery. (Wilopo et al., 2017). It was also reported that 8% of births had suboptimal birth spacing, and 7% were classified as unwanted births. (IDHS, 2018).

Integrated contraceptive counseling in maternal and child health services is a potential strategy to increase postpartum contraceptive use. (WHO et al., 2013). Research on the importance of continuous antenatal care (ANC), receiving postpartum care, and discussing contraception during pregnancy is effective in increasing postpartum contraceptive use. (Hale et al., 2014; Yimam et al., 2021). However, research linking maternal and child health service utilization with postpartum contraceptive use is still underexplored in Indonesia. Therefore, this study aims to examine the relationship between maternal and infant health services and contraceptive use among postpartum women in Indonesia.

METHOD

Study Design, Data Sources, Population, Sampling Procedures, and Data Analysis

This study is a quantitative research project utilizing secondary data from the 2017 Indonesia Demographic and Health Survey (IDHS). This study employed a cross-sectional design, with inclusion criteria for women who had given birth within the 2 years preceding the survey. Exclusion criteria are women who have had a hysterectomy after giving birth, and respondents who did not answer/or have missing data on the variables used. A total of 6,572 respondents were obtained, equivalent to 6,309 respondents in the weighted data. The data analysis employed in this study encompasses both descriptive and inferential analyses. Descriptive analysis was conducted to determine the distribution of subject characteristics. Inferential analysis used simple and multiple logistic regression. Simple logistic regression was used to determine the relationships between independent and dependent variables (bivariate analysis) and between external variables and dependent variables, while controlling for other variables. Multiple logistic regression was used to analyze the direction of the relationship between maternal and child health services and the use of modern contraception, taking into account adjustment variables (multivariate analysis). The data were processed and analyzed using STATA software. The analysis was conducted after the Ethics Committee of the Faculty of Medicine, Public Health, and Nursing at Gadjah Mada University issued ethical approval letter number KE/FK/0249/EC/2024, dated February 15, 2024.

Variable

The dependent variable is the use of modern contraception. In contrast, the independent variables are maternal and infant health services, determined by the number of antenatal visits, place of delivery, postnatal contact with healthcare workers, and infant health services received within 2 months after birth. The control variables included are the respondent's age, education, number of children, wealth quintile, area of residence, marital status, place of antenatal care, type of delivery, last sexual activity, discussion of family planning in the previous six months, exposure to family planning information, and internet use. A weighting analysis was conducted to minimize sampling

bias and provide estimates for the entire population, enabling the results to be generalized to the population. Weighting was done using the individual weight.

Operational Definition

Modern contraception is defined and coded as one if the respondent uses any type of contraception, such as female sterilization, pills, IUDs, injections, implants, condoms, or lactational amenorrhea method (MAL) (BKKBN, 2019a). Non-users of modern contraception are coded as 0, which includes those who use any methods other than those mentioned or do not use any contraception at all. Maternal and infant health services are defined by four maternal and neonatal health service indicator variables. Each component variable was first dichotomized.

The antenatal visit variable is coded as 1 if the respondent received health services 6 or more times during pregnancy, and 0 otherwise. The threshold of six antenatal care (ANC) visits was established by the Indonesian Ministry of Health Regulation (Permenkes) Number 21 of 2021, which governs maternal, childbirth, postpartum, contraceptive, and sexual health services. Have also confirmed

The place of delivery variable is coded as one if the respondent gave birth in a government or private facility, and zero if the birth occurred at home or in a non-health facility, as per government regulations.

The postnatal care variable is coded as 1 if the respondent received health services within 3 days after birth or upon returning from the health facility, and 0 if they reported not receiving any care.

The infant health service variable is coded as 1 if the respondent received infant health check-ups within 2 months after birth, and 0 if they reported not receiving any services.

The highest possible score for these service variables is 4, indicating that the respondent received all services, which is coded as 3. The lowest score is 0, assigned to respondents who did not receive any services during pregnancy and childbirth or received only one service.

Respondents' age variable was categorized into three groups based on reproductive-age risk categories for women. The education variable was classified into three categories based on the highest level of formal education the respondents had ever attended, regardless of whether they completed it. Other variables in this study are presented in the appendix of this article.

RESULTS

Respondent Characteristics

After applying weighting techniques, the study included 6309 women of reproductive age who had given birth within the past 2 years. Approximately 76.7% of women of reproductive age fall within the 20–35-year age group. Additionally, around 59% of these women have completed secondary education, and 40.5% belong to the middle-income quintile. The distribution of residences is nearly equal between urban (49.1%) and rural (50.9%) areas. The majority of respondents (97%) were married. Additionally, 80.6% had a history of normal childbirth, 76.6% were sexually active in the last 6 weeks, and 70.5% used modern contraception. The frequency distribution of maternal and infant health services indicates that 80.1% of individuals received examinations on six or more occasions. Additionally, 89.8% of individuals delivered their babies at a health facility, 82% received postnatal services, and 68.7% received infant health services. Table 1 provides additional information about the participants' characteristics.

Table 1. Respondent Characteristics

Variable	Category	Unweighted	Weighted
		n = 6.572 n (%)	n = 6.309 n (%)
Socio-demography			
Age in years	15-19 years old	296 (4,5%)	258 (4,1)
	20-35 years old	5.027 (76,5%)	4.835 (76,7)
	36-49 years old	1.249 (19,0%)	1.216 (19,2)
Education	No Education and Elementary School	1.548 (23,6%)	1.525 (24,2)
	Junior and Senior	3.740 (56,9%)	3.723 (59,0)
	Higher Education	1.284 (19,5%)	1,061 (16,8)
Wealth Quintiles	Lower	1.736 (26,4%)	1.223 (19,4)
	Middle	2.537 (38,6%)	2.552 (40,5)
	Upper	2.299 (35,0%)	2.533 (40,1)
Residential Area	Urban	3.243 (49,3%)	3.095 (49,1)
	Rural	3.329 (50,7%)	3.214 (50,9)
Reproductive Status			
Marital status	Not Married, Divorced	153 (2,3%)	123 (1,9)
	Living together	140 (2,1%)	66 (1,0)
	Married	6.279 (95,5%)	6.120 (97,0)
Number of children	1 child	2.092 (31,8%)	2.080 (32,9)
	2 children	2.124 (32,3%)	2.204 (34,9)
	≥ 3 children	2.356 (35,8%)	2.024 (32,1)
Types of childbirth	Normal Delivery	5.352 (81,4%)	5.087 (80,6)
	Caesarean Delivery	1.220 (18,6%)	1.222 (19,4)
Last sexual activity	Inactive sexual	1.605 (24,4%)	1.474 (23,4)
	Active sexual	4.967 (75,6%)	4.835 (76,6)
Contraceptive Use	Do not use	1.719 (26,2%)	1.396 (22,1)
	Traditional contraception	516 (7,9%)	463 (7,4)
	Modern Contraception	4.337 (66,0%)	4.449 (70,5)
Utilization of Maternal and Infant Health Services			
Number of Antenatal Cares	Not ANC	197 (3,0%)	143 (2,3)
	< 6 times	1.414 (21,5%)	1.108 (17,6)

	6 times or more	4.961 (75,5%)	5.058 (80,1)
Pregnancy Checkup Place	Didn't check/didn't answer	198 (3,0%)	143 (2,3)
	Home / UKBM	632 (9,6%)	500 (7,9)
	Government Health Facilities	2.833 (43,1%)	3.319 (52,6)
	Private Health Facilities	2.909 (44,3%)	2.346 (37,2)
Place of Delivery	Not a Health Facility	1.571 (23,9%)	1.139 (18,0)
	Private Health Facilities	2.654 (40,4%)	3.152 (50,0)
	Government Health Facilities	2.347 (35.7%)	2.018 (32,0)
Get postnatal care	No	2.010 (30.6%)	1.696 (26,9)
	Yes	4.562 (69.4%)	4.613 (73,1)
Get baby health services in 2 months	No	2.217 (33.7%)	1.976 (31,3)
	Yes	4.355 (66.3%)	4.333 (68,7)
Information Access			
Internet Use	No	3.374 (51.3%)	3.172 (50,3)
	Yes	3.198 (48.7%)	3.137 (49,7)
Discussed family planning in the last 6 months	No	2.457 (37.4%)	2.295 (36,4)
	Yes	4.115 (62.6%)	4.014 (63,6)
Exposure to Family Planning Information	Can't get information	1.474 (22.4%)	1.303 (20,7)
	Not from a health worker	2.634 (40.1%)	2.647 (41,9)
	From a health worker	2.464 (37.5%)	2.359 (37,4)

Source: processed by the author from IDHS 2017

Frequency Distribution of Contraceptive Use

The majority of participants in this study utilized injection contraception as their preferred method (39.8%). Meanwhile, conventional approaches primarily employ discontinuous sexual intercourse, accounting for 5.3% of cases. Table 2 provides specific details on the use of contraceptive methods in women of reproductive age (*WUS*).

Table 2. Frequency Distribution of Contraceptive Use

Types of Contraception	**Unweighted**	**Weighted**
	N= 6,572 n (%)	**N= 6,309 n (%)**

Do not use	**1,719 (26.2)**	**1,396 (22.1)**
Modern Contraception		
Pill	539 (8.2)	510 (8.1)
IUD	280 (4.3)	338 (5.3)
Injection 3 months	2,359 (35.9)	2,509 (39.8)
Injection 1 month	336 (5.1)	319 (5.1)
Implant	347 (5.3)	299 (4.7)
Lactational Amenorrhea Method	38 (0.6)	30 (0.5)
Condom	195 (3.0)	205 (3.2)
Female sterilization	239 (3.6)	233 (3.7)
Male Sterilization	4 (0.1)	4 (0.1)
Number of Modern Contraceptives	**4,337 (66.0)**	**4,447 (70.5)**
Traditional Method		
Periodic	141 (2.15)	121 (1.9)
Interrupted Intercourse	354 (5.39)	330 (5.3)
Other Traditional	21 (0.32)	12 (0.2)
Number of Traditional Contraceptives	**516 (7.86)**	**463 (7.4)**

Source: processed by the author from IDHS 2017

This study found that 70.5% of women with a two-year birth history were using modern contraceptives. Based on the same criteria, which is the delivery period of up to 2 years, this figure exceeds the research results of 68% in 2017 (Wilopo et al., 2017).

Predictor Factors for Modern Contraceptive Use

Table 3 shows the relationship between maternal and infant health service variables and the use of modern contraception, with adjustment variables. The analysis results indicate differences in the odds ratio (OR) before and after adjustment. There is a trend of increasing OR across each category within the maternal and infant health service variable. The maternal and infant health service variable represents a continuum of maternal healthcare from pregnancy to childbirth. This variable is constructed from four components: antenatal visits, place of delivery, postnatal services, and infant health services within two months after birth. Therefore, these four individual variables were excluded from the multivariable analysis to avoid multicollinearity. Although OR values decrease across categories of the health service variables in the multivariate analysis, a significant positive relationship with modern contraceptive use remains. Confounding was identified by sequentially removing external variables, starting with those having the highest p-values. A variable was considered a confounder and retained in the multivariable model if the odds ratio changed by 10% or more.e (Maldonado & Greenland, 1994). Therefore, although two variables were not statistically significant in the bivariate analysis, they were still included in the multivariable analysis. The complete analysis results are presented in Table 3.

Table 3. Relationship between maternal infant health service and the use of modern contraceptive (Weighted Data)

Respondent Characteristics	Not Modern Contraception	Modern Contraception	COR	aOR
	(n = 1860)	(n = 4449)	95% CI	95% CI
	n (%)	n (%)		
Antenatal Cares				
No	70 (49.1)	73 (50.9)	Ref	

1-5	360 (32.5)	748 (67.5)	2,008*** [1,414; 2,851]	
6+	1,430 (29.5)	3,6287 (71.5)	2,450*** [1,756; 3,418]	
Place of Delivery				
Non-health facility	357 (31,3)	782 (68,7)	Ref	
Private health facility	973 (30,9)	2179 (69,1)	1.023 [0.884,1.184]	
Government health facility	530 (26,3)	1488 (73,7)	1.281** [1.092,1.503]	
Postnatal Cares				
No	571 (33,6)	1126 (66,4)	Ref	
Yes	1289 (27,9)	3323 (72,1)	1.307*** [1.160,1.473]	
Neonatal Cares				
No	630 (31,9)	1346 (68,1)	Ref	
Yes	1230 (28,4)	3103 (71,6)	1.183** [1.054,1.327]	
Mother and Infant Services				
1 service	193 (37,9)	317 (62,1)	Ref	Ref
2 services	395 (32,8)	809 (67,2)	1.248* [1.006,1.549]	1.200 [0.937,1.537]
3 services	555 (27,8)	1440 (72,2)	1.580*** [1.289,1.937]	1.463** [1.150,1.861]
Complete services	717 (27,6)	1883 (72,4)	1.600*** [1.312,1.951]	1.523*** [1.194,1.943]
Maternal age				
15-19 years old	74 (28,5)	185 (71,5)	Ref	Ref
20-35 years old	1439 (29,7)	3397 (70,3)	0.940 [0.712,1.240]	0.652* [0.469,0.906]
35 years old and over	348 (28,7)	868 (71,4)	0.992 [0.737,1.335]	0.599** [0.415,0.866]
Education				
Basic	370 (24,3)	1155 (75,7)	2.329*** [1.967,2.757]	2.440*** [1.959,3.040]
Middle	1037 (27,8)	2686 (72,2)	1.933*** [1.679,2.226]	1.929*** [1.641,2.268]
Higher	453 (42,7)	608 (57,3)	Ref	Ref
Wealth				
Lower	395 (32,3)	829 (67,7)	Ref	Ref

Middle	617 (24,1)	1936 (75,9)	1.496*** [1,287-1,739]	1.510*** [1.265, 1.803]
Upper	849 (33,5)	1685 (66,5)	0,945 [0.817-1.093]	1.094 [0,892-1.341]
Residential				
Urban	972 (31,4)	2123 (68,6)	Ref	Ref
Rural	889 (24,6)	2326 (72,4)	1.198** [1.075,1.336]	1.132 [0.992,1.292]
Marital Status				
Not married	106 (86,5)	17 (13,5)	Ref	Ref
Living together	31 (46,0)	36 (54,0)	7.542*** [3.718,15.30]	4.686*** [2.216,9.911]
Married	1724 (28,2)	4397 (71,8)	16.39*** [9.738,27.58]	6.744*** [3.916,11.62]
Number of children				
1	728 (35,0)	1353 (65,0)	Ref	Ref
2	564 (25,6)	1641 (74,4)	1.565*** [1.372,1.785]	1.477*** [1.275,1.712]
3+	569 (28,1)	1456 (71,9)	1.376*** [1.205,1.570]	1.309** [1.105,1.551]
Place of ANC				
Not ANC	71 (49,1)	73 (50,9)	Ref	Ref
Home/Community-Based Health Unit	109 (21,7)	392 (78,3)	3.481*** [2.357,5.143]	2.554*** [1.646,3.962]
Private Health Facilities	1014 (30,5)	2306 (69,5)	2.193*** [1.568,3.066]	1.963*** [1.316,2.929]
Government Health Facilities	667 (28,4)	1679 (71,6)	2.427*** [1.729,3.407]	2.009*** [1.351,2.987]
Types				
Normal	1512 (29,7)	3575 (70,3)	Ref	Ref
Caesar	349 (28,5)	874 (71,5)	1.059 [0.923,1.216]	1.250** [1.072,1.459]
Sexual Activities				
Not active	729 (49,4)	746 (50,6)	Ref	Ref
Active	1132 (23,4)	3703 (76,6)	3.199*** [2.832,3.614]	3.059*** [2.681,3.491]
Internet Use				
No	801 (25,2)	2372 (74,8)	1.512*** [1.356,1.687]	1.244** [1.071,1.445]
Yes	1060 (33,8)	2077 (66,2)	Ref	Ref

Family Planning Discussions in the Last 6 Months				
No	786 (34,2)	1510 (65,8)	Ref	Ref
Yes	1075 (26,8)	2940 (73,2)	1.423*** [1.273,1.590]	1.307*** [1.151,1.485]
Exposure to Family Planning Information				
Can't get info	421 (32,3)	882 (67,7)	Ref	Ref
Not from a health worker	846 (31,9)	1802 (68,1)	1.017 [0.882,1.172]	0.939 [0.798,1.105]
From a health worker	593 (25,2)	1765 (74,8)	1.421*** [1.224,1.649]	1.274** [1.072,1.514]

Source: processed by the author from IDHS 2017
Description: Weighted data
Note: cOR = crude odds ratio: *=p < 0.05, ** = p < 0.01, *** p < 0.001

The study discovered a link between the availability of all the maternal and infant health services and the use of modern contraception. This was true even when other factors were taken into account, like the maternal age, level of education, wealth, residence, marital status, number of children, place of ANC, type of delivery, sexual activity, internet use, family planning discussions, and exposure to family planning information (aOR = 1.5; 95% CI = 1.194–1.943). Respondents who received a minimum of three maternal and infant health services had 1.4 times higher odds of using modern contraception compared to those who received only one service, with a 95% confidence interval ranging from 1.150 to 1.861.

DISCUSSION

This study aims to investigate the correlation between maternal and infant health services and modern contraceptive use among postpartum women in Indonesia, while considering other predictor factors using data from the 2017 Indonesian Demographic and Health Survey (IDHS).

Relationship between Maternal and Infant Health Services and the Use of Modern Contraceptives

Following the multivariable analysis, the findings revealed that women who received complete maternal and infant health services were more likely to use modern contraceptives postpartum compared to those who received only one type of service. This aligns with national and international recommendations promoting integrated contraceptive services within maternal and child health care to support birth spacing, prevent unintended pregnancies, and facilitate maternal recovery and infant care. (Kemenkes, 2021; WHO, 2016, 2018, 2022).

Previous studies in Ethiopia, Tessema et al. (2018), and India, Gupta et al. (2023), have also confirmed the positive impact of maternal and infant health services on postpartum contraceptive uptake. However, research in Ethiopia in 2019 and 2022 noted that not all individual components of maternal and infant health services were significantly associated with contraceptive use; only specific services showed a notable link. (Mruts et al., 2022; Zimmerman et al., 2019).

Integrating contraceptive services throughout the continuum of reproductive healthcare is considered an effective strategy to strengthen family planning programs. (Shah et al., 2015). This study found a positive dose-response relationship, where more comprehensive exposure to maternal and infant health services was associated with a higher likelihood of modern contraceptive use, supporting previous findings from India. (Bansal et al., 2022; Dixit et al., 2017).

This study supports the integration of family planning services into maternal and infant health care, as recommended by the WHO in 2013. The findings underscore the importance of implementing integrated contraceptive services by maternal and infant healthcare providers. From a family planning program perspective, the reproductive period is considered an ideal time to educate couples about family planning. This intervention is based on the assumption that the demand for contraceptive methods increases significantly after childbirth. Therefore, the provision of contraceptive services should begin before the mother is discharged from the health facility, during postnatal care, and may continue during infant health or immunization visits. (Shah et al., 2015; WHO et al., 2013).

This study also found that the proportion of respondents who received contraceptive information from healthcare providers was 37%, while 41.9% received information from other sources. The quality of the information supplied in contraceptive services is measured by the Method Informed Index (MII). Although MII was not measured in this study, the proportion of respondents who received contraceptive information from healthcare providers in the last six months was only 37%. This is not far from the BKKBN report, which found that the MII in 2019 was only 40% (BKKBN, 2019b). Contraceptive counseling should include information about side effects, appropriate actions to take if side effects occur, and alternative contraceptive methods. Providing comprehensive information on side effects is essential to prevent discontinuation, which may lead to unintended pregnancies and contribute to unmet needs. (Lopez et al., 2015). While the proportion of modern contraceptive users found in the study was high (70.5%), if the information received is inadequate, it may result in a lack of understanding and lower quality of use (Choi, 2018). Therefore, maternal and child healthcare providers need to offer comprehensive counseling and contraceptive information so that users can fully benefit from these services.

Other Predictors of Modern Contraceptive Use

In this study, it was found that women aged 20-35 and over 35 years were less likely to use modern contraceptives compared to those aged 15-19 years. This suggests that the likelihood of using modern contraceptives is lower among women over the age of 35. This finding is related to the decrease in sexual activity frequency as women age, making older women less likely to use contraception (Dixit et al., 2017). On the other hand, younger couples tend to have higher levels of sexual activity and a longer reproductive period, necessitating strategies to reduce the likelihood of unintended or unplanned pregnancies. (Negash et al., 2022).

Women with low and medium education levels are more likely to use modern contraceptives compared to those with higher education. This finding is consistent with previous research in Indonesia. (Ekoriano et al., 2020; Wilopo et al., 2017) and several other countries (Götmark & Andersson, 2020; Yimam et al., 2021). Women with medium and low education levels have already recognized the benefits and importance of contraceptives, often informed by healthcare providers or other sources. Most contraceptive users receive more intensive information about modern contraceptives from midwives at health centers, as the issues they face can be analyzed and addressed. (Kirana & Idris, 2022). In contrast, individuals with higher education tend to prefer traditional contraceptives due to their generally lower side effects. (Fatmawati & Martha, 2022).

Wealth level in the middle-income category is positively associated with the use of modern contraceptives compared to the low-income category. This is consistent with previous research, which shows that women with middle-income levels are more likely to use contraceptives than those with lower income levels. Couples with higher incomes tend to prioritize quality over quantity when it comes to family size, focusing their income more on education costs rather than increasing the number of children. (Ekoriano, 2018; Negash et al., 2022).

Marital status allows couples to make joint decisions regarding the use of modern contraceptives. (Hameed et al., 2014; MacQuarrie & Aziz, 2022). In addition to being united by marital status, this study also found respondents with a cohabiting status. In this group, the need for contraception is not only based on marital status but also on the need to prevent pregnancy and limit births. (Zegeye et al., 2022).

Engaging in conversations or discussions about contraception exposes women to Family Planning information. The results of this study found that conversations about contraception in the past few months significantly increased the likelihood of contraceptive use compared to those who did not engage in such discussions. Conversations with husbands, friends, or family members who have experience using contraception can enhance motivation and provide valuable information for postpartum women to participate in contraceptive use. (Coomson & Manu, 2019).

Discussions held within healthcare settings can lead to greater Knowledge of Family Planning methods, making women more likely to use contraception than those who lack such Knowledge. (Lasong et al., 2020). On the other hand, Knowledge about contraception can sometimes act as a barrier to its use. (Priskatindea & Ronoatmodjo, 2021). Literature reviews suggest that fear of side effects is a common reason why some women choose not to use contraception. (Dev et al., 2019).

Internet usage in this study was found to have a negative relationship with modern contraceptive use, consistent with previous research. (Ekawati & Herdayati, 2020; Harzif et al., 2023). The presence of the internet and social media does not increase the intention of postpartum contraceptive use; in fact, it has the opposite effect. Women who are not active internet users are more likely to use contraception compared to those who are active online. The internet makes it easy for individuals to access any information, including hoaxes and unreliable sources. Untrustworthy information from social media can influence a person's perception when choosing a contraceptive method. (Huang et al., 2024). The multivariable analysis in this study found that place of residence was not significantly associated with contraceptive use. This may be related to the uneven access to the internet in rural areas, where residents are more likely to trust community leaders and healthcare professionals over information from the internet. Consequently, social media can become a barrier to contraceptive use. Healthcare providers should consider leveraging social media through short messages, interactive discussions, and collaborations with influencers to address and correct any misconceptions about contraception that may be circulating.

This study provides empirical support for the theory that the continuity of maternal and infant health services is positively associated with postpartum modern contraceptive use. In addition, it utilizes nationally representative data from the 2017 Indonesia Demographic and Health Survey (IDHS), employs validated instruments, and benefits from a large sample size and well-designed procedures, including enumerator training, thereby ensuring that the data accurately reflect the national context in Indonesia.

Nonetheless, this study has several limitations. The measurement of maternal and infant health services was based on only one representative variable from each of the four services, without accounting for the specific components provided within each service. Moreover, the measurement of internet use may be less relevant in the current context, as by 2024, nearly all individuals will be internet users, with differences primarily in the quality and quantity of their use. This study also did not explore differences in contraceptive use between respondents with children under one year of age and those with children older than one year, which could serve as an indicator of early contraceptive uptake.

CONCLUSION

The findings of this study indicate that respondents who received comprehensive maternal and infant health services had a higher likelihood of using modern contraceptives compared to those who received only one service. This suggests that increased exposure to maternal health services is associated with a greater probability of postpartum contraceptive use. However, the continuity of these services must be accompanied by improvements in service quality to ensure that comprehensive information is provided, thereby preventing discontinuation of contraception.

To support this program, it is hoped that the BKKBN will continue to provide support for infrastructure and skill development for contraceptive service providers. Additionally, there is a need to reactivate field workers for family planning to enhance coordination with health services. The Ministry of Health is also expected to conduct and improve evaluations of field services related to integrated contraceptive care within maternal and child health services.

Future research is recommended to employ cohort designs or survival analysis to identify the timing of postpartum contraceptive initiation and the likelihood of discontinuation before the child reaches two years of age. Additionally, qualitative studies are necessary to investigate how integrated contraceptive services are delivered within maternal and infant healthcare settings.

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APPENDIX

The wealth variable was categorized based on the ownership of various household assets, ranging from televisions to bicycles or cars, as well as housing characteristics, as classified by the 2017 Indonesian Demographic and Health Survey (IDHS).

The residence variable refers to the geographical area where the respondent lived at the time of the survey. Marital status refers to the respondent's marital condition at the time of the study.

The number of children variable represents the number of living children ever born to the respondent.

Type of delivery refers to the most recent childbirth experience of the respondent. The last sexual activity variable is defined as the time interval between the date of the survey and the respondent's most recent sexual intercourse.

Respondents were considered sexually active if they had intercourse within the past 30 days (four weeks before the survey).

The variable for discussing family planning in the past six months is defined as whether the respondent had discussed family planning with anyone during that period, categorized as 'no' (0) and 'yes' (1).

Exposure to family planning information is defined as receiving information about family planning in the past six months, categorized as no exposure (0), exposure from non-health personnel (1), and exposure from healthcare providers (2).

Internet use is defined as any access to the internet, including social media, in the past 12 months.