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ORIGINAL RESEARCH

Trends and Determinants of Modern Contraceptive Use in Indonesia

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Abstract

Background: Modern contraceptive use (MCU) among married adolescents aged 15–19 years is notably low and eventually affects the fertility rate and leads to unwanted pregnancies.

Objective: To analyze factors associated with modern contraceptive use by utilizing a secondary dataset from the Indonesian Demographic and Health Survey (IDHS) 2012 and 2017.

Methods: This study's sample consisted of married adolescents aged 15–19, with 890 and 670 samples obtained from the 2017 and 2012 datasets. The relationship between modern contraceptives and independent variables was analyzed using simple logistic regression tests in bivariate analysis and multiple logistic regression tests in multivariate analysis.

Results: The use of modern contraceptives among married adolescents aged 15-19 years according to IDHS 2012 was identified in 424 individuals (47.64%). IDHS 2017 identified 307 (43.8%). The number of living children ≥1 person [AOR=20.61; 95% CI=12.18- 34.88], parity ≥1 [AOR=15.76; 95% CI=8.54- 29.08], and a working husband [AOR=7.97; 95% CI=2.61- 24.27] significantly influence modern contraceptive use.

Conclusion: According to this study, in 2012, the dominant factors in the use of modern contraception among adolescents were the numbers of living children and the husband's employment status, while in 2017, the dominant factors were parity and literacy. To maintain the fertility rate in Indonesia, governments need to improve Family Planning services at every level of society and provide interventions according to the relevant age groups.

Keywords: Adolescents, Family Planning, Modern Contraceptives Use, Trend and Determinants

Introduction

Contraceptives are classified into modern and traditional methods.[1] A method is considered "modern" if it has passed tests in appropriately designed studies assessing efficacy under various conditions, has strong essential characteristics in reproductive biology, and uses appropriate and correct protocols.[2]

Modern contraceptive methods encompass female and male sterilization, intrauterine devices (IUDs), implants, injections, oral contraceptive pills, male and female condoms, vaginal barrier methods (including diaphragms, cervical caps, spermicidal foams, jellies, creams, and sponges), lactational amenorrhea methods (LAM), emergency contraceptives, and other modern methods which are not reported separately (e.g., contraceptive patch or vaginal ring). Traditional contraceptive methods include periodic coitus (e.g., fertility awareness-based methods and periodic abstinence), withdrawal, and other traditional methods not reported separately.[3] Modern contraceptives are more effective at preventing unwanted pregnancies than traditional contraceptives.[1] The incidence of pregnancy with modern contraceptives is very low, 1:100, compared to traditional methods, 3:100.[4] Therefore, the use of modern methods is highly recommended, also by the UN.[5] However, the modern contraceptive prevalence rate (MCPR) decreased from 57.9% in 2012 to 2017, while the rate of use of traditional contraceptives increased from 4% to 6% in the same period.[3,6]

Low use of modern methods is particularly evident among adolescents. In developed countries, the modern contraceptive use (MCU) among sexually active adolescents is less than 50%.[7] Meanwhile, in several countries, the MCU among adolescents still ranges between 6% and 27%. [8] Adolescents are an age group that has complex sexual and reproductive health problems.[9] The prevalence of unwanted pregnancies among teenagers is increasing, reaching 9:10, with 80% not using contraception,[10] which can be prevented by using a modern contraceptive.[11]

Objectives: The inquiry concerns the determinants of modern contraceptive use and the corresponding interventions. This study endeavors to analyze the factors influencing the adoption of modern contraceptives among adolescents in Indonesia, utilizing data from the Indonesian Demographic and Health Survey (IDHS) 2012 and 2017. Additionally, the study aims to identify

intervention strategies that could augment the use of modern contraceptives within this demographic. It is anticipated that these findings will assist family planning officials at the community level in the early identification of determinant factors, thereby enabling prompt coordination with healthcare professionals at medical facilities to enhance the Maternal and Child Protection Rate (MCPR) and sustain the Total Fertility Rate (TFR).

Methods

Study Design

This study employed a cross-sectional design to address the research questions, using the 2012 and 2017 Indonesian Demographic and Health Survey (IDHS) data as a representative dataset appropriate to the conditions prevailing in Indonesia. The IDHS is a periodic study conducted every five years, and the 2017 dataset is the latest available, so researchers can rely on it to gain insights and make informed decisions. The IDHS dataset is collected as part of the DHS Program, which addresses fertility, family planning, and maternal and child health issues every 5 years in relevant countries. The survey was conducted in 33 provinces in 2012 and 34 provinces in 2017.[12,13]

This study will continue by developing a machine-learning prediction model and a prototype to predict participation in modern contraception in the community. The goal is to collect new data to improve the prediction of modern contraceptive use in this study.

Data Collection techniques and data source

Secondary data from official and reputable sources were used in this research. The data subsequently underwent a rigorous curation process to affirm its quality, consistency, and relevance to the research objectives. This phase encompassed cleaning the data to remove duplicates and manage missing information, standardizing formats and variable nomenclature to ensure uniformity, and validating the data to confirm its logical and substantive accuracy. The curated dataset was systematically organized and thoroughly documented to facilitate an optimal analytical process.

The data for this study were drawn from the Individual Record for women aged 15–49 years. The number of women of reproductive age interviewed was 45,607 in 2012 and 49,627 in 2017. However, the inclusion criteria for this study were women aged 15–19 years who were

currently married. In the end, a total of 890 women in 2012 and 670 women in 2017 were analyzed in this study.[11] This study retained all the samples in the IDHS regardless of missing values at the individual level, but paid attention to missing values at the variable level (<10%).

The dependent variable in this study was modern contraceptive use (MCU). The "yes" category included those who use modern contraception (including intrauterine devices, implants, female and male sterilization, injections, oral contraceptive pills, male and female condoms, LAM, and other modern methods), and the "no" category includes those who do not use any contraception and those who use traditional contraception. The independent variables were derived from the literature review and grouped into four factors: sociodemographic, reproductive, individual, and health service.[8,14,15] The variables in this study comprised 17 factors, encompassing sociodemographic elements (respondents' education, husbands' education, wealth quintile, living environment, media exposure, employment status, and husbands' employment status), individual characteristics (family planning knowledge, fecundity, current residence status, literacy skills, knowledge about fertility, and desires regarding childbirth), reproductive metrics (number of living children and parity), and health facility-related factors (such as visits by family planning officers). Additionally, in 2017, an extra variable related to health worker support was incorporated. All variables analyzed in this study exhibited less than 10% missing data, thereby minimizing potential bias in the research findings.

Ethics approval

This paper has obtained ethical approval from the Faculty of Public Health, University of Indonesia, with Ethical Approval Number: Ket-428/UN2.F10.D11/PPM.00.02/2024. All data in this study were obtained legally from the DHS Program at https://dhsprogram.com/data/available datasets.cfm

Method of data analysis

Data in this study were analyzed using a complex-sample approach to account for stratification and incorporate weights, strata, and primary sampling units (PSUs). Descriptive analysis was conducted using frequencies for categorical variables and, if applicable, means and standard deviations for numerical variables. Inferential statistics were performed using two methods:

bivariate analysis was carried out using simple logistic regression to produce a crude odds ratio, while multivariate analysis was carried out using multiple logistic regression with the enter method, in which all variables were entered into the model simultaneously to produce an adjusted odds ratio. Statistical significance was set at 0.05, and the variable selection threshold was set to 0.25, meaning that variables with p-values < 0.25 would be included in the multivariate analysis. All analyses were conducted using Stata (StataCorp, Texas, version 17).

Results

The number of married adolescents aged 15–19 was 890 in 2012 and 670 in 2017. In the 2012 bivariate analysis, variables with a p-value < 0.25 were the respondent's education, husband's education, wealth quintile, respondent's working status, fecundity, current residence status, desire to have children, husband's desire to have children, number of living children, and parity. These variables were then adjusted in the multivariate model. In 2017, nine variables with a p-value < 0.25 included respondent education, wealth quintile, current residence status, literacy skills, knowledge about fertility, number of living children, parity, official visits, and support from health workers. However, the desire to have children variable was not included in the multivariate model due to collinearity.

In the multivariate analysis (Table I), the number of living children was associated with MCU; women with at least one child had higher odds of practicing MCPR (aOR: 11.05 (2.89–41.18) in 2012 and 26.63 (20.39–34.77) in 2017). Respondent's education was associated with MCU, with women in high school and above having lower odds of using modern contraception than their counterparts (aOR: 0.50 (0.30–0.40) in 2012 and 0.64 (0.60–0.68) in 2017). Women whose husbands lived elsewhere had lower odds of practicing MCU (aOR: 0.35 (0.16–0.76) in 2012 and 0.42 (0.37–0.47) in 2017). Several variables were associated with MCU in 2012 but not in 2017. Fecundity was associated with MCU; women who wanted to have more children had a higher likelihood of MCU (aOR: 3.69 (1.64–8.28)), whereas no association was found for "don't want". Husbands' employment status was associated with MCU, with working husbands having higher odds (aOR: 7.87 (2.59–23.87)) of MCU.

In addition, some variables were associated with MCPR in 2017 but not in 2012. The wealth quintile

showed a significant association with higher odds from the poorest class to the richer classes (aOR: 1.27 (1.15–1.40) for poorer, 1.21 (1.09–1.34) for middle class, and 1.12 (1.01–1.24) for rich). Literacy was also associated with MCPR, with reading ability linked to higher odds (aOR: 2.06 (1.75–2.42)). Fertility knowledge was also associated with MCPR (aOR: 0.89 (0.94–0.96)). Parity was also associated with MCPR, with women who had given birth having higher odds of MCPR (aOR: 1.97 (1.85–2.10)). In addition, healthcare worker support was associated with higher odds of MCPR (aOR: 1.17 (1.17–1.27)).

Discussion

This study shows that the modern contraceptive prevalence rate (MCPR) in Indonesia during 2007-2012 (57.9%) decreased during 2012-2017 (57.2%). Indonesia is ranked 3rd (44,4%) in ASEAN; this achievement is still below the world average (48.5%).[16] During the same period, the 15-19-year-old age group (47.6%) decreased to 43.8%; this group had the lowest MCPR among age groups.[3] This shows that there is a similarity in the low level of MCU across periods among adolescents and that there is inequality across age groups of women. While adolescents can safely use any contraceptive method, age is not a medical reason to exclude any method.[4] The condition of low MCPR among adolescents also occurs in several countries; in Ethiopia, it ranges from 12% to 79%, [17] in North-Western Tanzania, among married adolescents (19,4%) and unmarried adolescents (48,7%).[7] Meanwhile, MCPR among adolescents ages 16-19 is quite high in developed countries, including England (68%) and the USA (52%).[18] In 2017, health worker support became an additional variable. This may be because the role of officers is considered important for supporting contraceptive use and increasing knowledge at a young age.[9,10,17] The MCU relies on people who provide health education on family planning and can be consulted, and the group with the greatest influence is health educators (HEWs).[19] In line with research findings, support from family planning officers is needed to provide communication, information, and education to increase contraceptive use, build trust, and overcome societal norms. This study involved the same group of married adolescents aged 15-19 years; they needed information on sexual and reproductive health, including contraception.[20]

This research shows that the number of living children influences modern contraceptive use. In this case, women with >1 living child are more likely to use modern contraceptives. Women with 2 or 3 children are three times more likely to use modern contraceptive methods than women with no or one child. Conversely, young women who want to have children soon, have few children, or do not have sons or daughters are less likely to use contraception.[14]

The results of this study showed that among married adolescents aged 15-19 years in 2012, husbands who had jobs were 7.87 times more likely to use modern contraceptives than those who did not work. In line with research, husbands who work are 6.75 times more likely to use modern contraceptives than those who do not work.[21] Husbands and extended families influence women's decisions in Thailand about using contraception. [22] Regarding the fecundity factor, it was found that women who had the potential to want to have children were 3.69 times more likely to use modern contraceptives than those who did not want children. This is interesting because it differs from other research, which shows that women who prefer to have more children often do not use contraception or stop using it.[23,24] This may be related to the fact that they choose to stop using contraception to have many children.[24]

In 2017, it was determined that literate women were 2.06 times more likely to use modern contraceptives than their illiterate counterparts. Furthermore, the use of modern contraceptives is more prevalent among women who can read part of a sentence than among those who are illiterate.[25] Improving health literacy and pregnancy-prevention practices among Thai students can be achieved through safe sex programs.[26] Parity also influences the use of modern contraceptives; the results of this study show that women who have given birth ≥1 time are more likely to use modern contraception than women who have never given birth. Parity, or the number of children born, influences the use of modern contraception among adolescents.[27]

Various interventions have been implemented in several countries, including Ethiopia, Nigeria, and Tanzania, to increase MCU among adolescents through the Adolescents 360 (A360) program, which provides community-based sexual and reproductive health education, counseling, and contraception through 'adolescent-friendly' services.[28] The program offers

comprehensive services, ranging from education and maternal, child, and family health services to health promotion and treatment.[29] In the UK, new educational initiatives and regulations are encouraging the use of long-acting reversible contraceptive (LARC) methods among adolescents. In the US, similar guidelines encourage the use of LARC methods and emphasize counseling.[18] Interventions have focused on service quality, including financial accessibility, communication, and partner involvement, as well as on women's empowerment and increased educational levels.[30] Key points for communicating with the younger generation include emphasizing empathy, saving time, respecting their knowledge, being trustworthy, and being web- and mobile-based.[31] Interventions implemented in Indonesia to increase the use of modern contraceptives include the first-generation planning program (GenRe), which has been implemented since 2010 and provides education to adolescents and young couples on reproductive health, family planning, and the use of modern contraceptives. Second, a family planning village program started in 2016, and targets married adolescents in villages by providing contraceptive services (pills, IUDs, implants, condoms) and education on the benefits of family planning. Third, starting in 2020, education has been intensified for Millennials and Generation Z, who use digital platforms and social media. Fourth, the "Bangga Kencana" program was launched in 2020 as a family planning tool to increase young couples' access to and knowledge about modern contraceptives. Finally, family planning services in health facilities have been implemented since 1970 and continue to be updated, with a focus on early family planning for couples. Married adolescents should be provided with free or subsidized access to modern contraceptives through services at Community Health Centers, Posyandu, and Midwives.[6] This study utilized secondary data with a limited set of variables; however, it possessed the potential to incorporate machine-learning-based predictive models in future research.

Conclusion

The prevalence of MCU among married adolescents aged 15-19 years experienced a decline from 2012 to 2017. Five variables were identified as influencing the utilization of modern contraceptives in the 2012 Demographic and Health Survey (respondent education, living with a partner, number of living children,

fecundity, and husband's occupation). Conversely, in the 2017 IDHS, eight variables influenced the use of modern contraceptive methods: respondent education, wealth quintile, living with a partner, reading ability, knowledge about fertility, desire to have children, number of living children, parity, and support from health workers. This indicates that the determinants affecting modern contraceptive use among married adolescents aged 15-19 years in 2012 differed from those in 2017. Consequently, tailored approaches are necessary for each generation, including educational initiatives and targeted interventions involving partners, women's empowerment, and technological solutions. Healthcare professionals and family planning officers can enhance the quality of family planning services for married adolescents by providing counseling through updated media platforms, thereby facilitating greater acceptance among this demographic.

Authors' Contributions: DNH performed the Conceptualization, Formal analysis, Writing the original draft, review, Editing. KNS: Conceptualization, Formal analysis, Review. MH: Conceptualization, Methodology. TE: Conceptualization, Methodology.

Conflict of interests: The authors declare that they have no known conflicts of interest that could influence the work reported in this paper.

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Table I: Factors Related to Modern Contraceptive Use in Indonesia

IDHS 2012			IDHS 2017		
Variable	**MCU in women aged 15-19 years**		**Variable**	**MCU in women aged 15-19 years**	
	aOR (95% CI)	**p-value**		**aOR (95% CI)**	**p-value**
Number of living children*			**Ability literacy**		
No	1		Illiterate	1	
≥ 1	20.61 (12.18-34.88)	0.000	Literate	6.22 (1.48-26.03)	0.012
			Blind	-	-
Husband's working status*			**Parity**		
No	1		0	1	0.000
Yes	7.97 (2.61-24.27)	0.000	≥ 1	15.76 (8.54-29.08)	
Don't know	11.58 (2.39-55.98)	0.002			
Fecundity*			**Wealth quintile ***		
Fecund/undecided	1		Poorest	1	
Want to have another	3.91 (1.60–9.50)	0.003	Poor	0.54 (0.29-0.99)	0.048
Do not want another	2.47 (0.74–8.20)	0.139	Middle	2.19 (0.99-4.82)	0.050
			Rich	1.14 (0.56-2.31)	0.711
			Richest	3.75 (1.10-12.79)	0.034
Respondent's education*	1		**Respondent's education***		
Below high school	0.59 (0.36–0.95)		Below high school	1	
High school and above		0.033	High school and above	0.37 (0.22-0.63)	0.000
Current husband's residence status*			**Current residence status***		
with respondent	1	0.004	with respondent	1	
living elsewhere	0.35 (0.17–0.72)		living elsewhere	0.33 (0.14-0.74)	0.008
			Knowledge of fertility*		
			Incorrect	1	
			Correct	0.45 (0.26-0.80)	0.007

Information:

* Selected independent variables that are considered to have an adjusted correlation with the dependent variable with a p-value <0.05