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Teenage Pregnancy in Indonesia: Unraveling its Impact on the Health of Children Under Five

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Abstract

Teenage pregnancy is a social issue worldwide, and various assumptions suggest negative health impacts due to adolescent pregnancy. The objective of this research is to explore the adverse effects on infants born to teenage mothers. Data from the 2017 Indonesia Demographic and Health Survey (IDHS) involving 2862 childbirths from women aged 15-24 are utilised. Chi-square tests and logistic regression are employed. The birth rate among teenage women is 370 (12.93%), with the majority residing in rural areas (55.2%). After adjusting for sociodemographic factors and adequacy of Antenatal Care (ANC) visits, compared to births from adult women (20-24 years), births from teenage women (15-19 years) are associated with an increased likelihood of diarrhea (AOR=0.728, 95% CI: 0.555-0.954). Infants born to specific age groups of teenage mothers (17-18 years) maintain a probability of diarrhea (AOR=0.643, 95% CI: 0.444-0.933) and Low Birth Weight (LBW) (AOR=1.887, 95% CI: 1.218-2.926). Teenage pregnancy, particularly at specific age ranges, increases the risk of diarrhea in infants and LBW.

Keywords:

Teenage pregnancy, health impact, morbidity, Low Birth Weight (LBW), childbirth

Introduction

Adolescence is a transitional period from childhood to adulthood. According to the World Health Organization (WHO), adolescence is defined as the age range of 12 to 24 years for individuals who are not yet married. This aligns with the definition provided by the National Family Planning Coordination Board (BKKBN) in Indonesia, which considers individuals aged 15 to 24 to be adolescents. Additionally, various studies on adolescent reproductive health set the age limit for adolescents at 15 to 24 years. This phase marks the development of adult mental and identity aspects. Biologically, an individual is considered an adolescent when they undergo puberty.[1]

The results of the 2017 Indonesia Demographic and Health Survey (IDHS) indicate that approximately 2% of adolescent females aged 15-24 and 8% of males in the same age group acknowledge engaging in premarital sexual relations. Among them, 11% face unwanted pregnancies. Among those who have engaged in premarital sexual activity, 59% of females and 74% of males they are reported experiencing such encounters within the age range of 15-19 years. According to the findings of the 2017 IDHS survey, the most common sexual activities among adolescents in the 15-19 age group include holding hands, followed by kissing. Additionally, some adolescents admit to engaging in intimate touching of sensitive body parts of their partners. Furthermore, approximately 3.6% of adolescent males confess to having been involved in sexual relationships resembling marital unions.[2,3]

The contemporary sexual conduct of adolescents plays a pivotal role in the heightened prevalence of unintended pregnancies. Adolescent pregnancy remains a considerable societal quandary, manifest in both developed and developing nations.[4] Annually, approximately 21 million births occur among adolescents aged 15–19 in low- and middle-income countries (LMICs), as reported by the WHO. Nearly half of these pregnancies, resulting in around 12 million births, are classified as unintended. Complications associated with pregnancy and childbirth stand as principal determinants of maternal mortality in the 15-19 age group. Annually, an estimated 5.6 million abortions occur among female adolescents aged 15-19, of which 3.9 million are delineated as unsafe abortions. These unsafe abortions contribute significantly to maternal mortality, morbidity, and enduring health challenges. The statistical data underscores the imperative for all-encompassing sexual education, accessible reproductive health services, and social support structures tailored for adolescents to contend with and alleviate the predicaments linked with adolescent pregnancy. By addressing these determinants, a contributory reduction in the frequency of unintended pregnancies, unsafe abortions, and associated health complications among adolescents is conceivable.[5,6]

In addition to free-sex behavior, teenage pregnancies also result from early marriages. Teenage births in Indonesia fall into the high category. The average adolescent birth rate in the Southeast Asia region in 2018 was 47 births per 1000 females aged 15 to 19, closely approaching the global average of 50 births per 1000 females in the same age group. Indonesia ranks fourth, following Thailand, with an average teenage birth rate higher than the regional average, at 48 births per 1000 females aged 15 to 19.[7,8]

According to the Ministry of Health of the Republic of Indonesia, deliveries among mothers under 20 contribute to the high rates of neonatal, infant, and toddler mortality. Additionally, pregnancies at a young age or during adolescence pose risks of premature birth, Low Birth Weight (LBW), and delivery-related bleeding, which can increase maternal and infant mortality.[9] Child marriage leading to teenage pregnancies has been linked to various negative impacts on both mothers and children. It has been demonstrated that young brides are at a higher risk of experiencing unwanted pregnancies and facing high-risk situations, sexually transmitted diseases, and obstetric complications.[10] Furthermore, the increase in the number of low birth weight babies has been confirmed as one of the consequences of teenage pregnancies.[11,12]

Given the continued importance of reducing early marriage rates in the context of the 2030 Sustainable Development Goals (SDGs) and various studies indicating potential health impacts following early marriage, especially when adolescents experience pregnancies, it is crucial to understand the specific consequences of teenage pregnancies, particularly on morbidity and LBW status in offspring born to adolescent mothers, using national publication data. Therefore, this research aims to explore whether teenage pregnancies have an impact on the morbidity and LBW of newborns in Indonesia.

Method

This research employs a quantitative research design utilising a cross-sectional approach, examining data pertaining to births that occurred within the last five years from the 2017 IDHS. The IDHS is a nationally representative survey conducted collaboratively by the Central Statistics Agency (BPS), the National Population and Family Planning Board (BKKBN), and the Ministry of Health (Kemenkes), and the Indonesian government financially supports it. The technical implementation of the survey involves support from ICF through the DHS Program, an initiative funded by the United States Agency for International Development (USAID) that provides financial support and technical assistance for population and health surveys in various countries. The IDHS is designed to collect and report demographic information, encompassing

areas such as family planning, maternal and child health, and fertility, as well as knowledge about HIV/AIDS and Sexually Transmitted Infections (STIs).[2]

2.1. Population and Sampling

This study utilises data from IDHS 2017, specifically focusing on individual female data. The survey employs a two-stage cluster sampling design with rural-urban and regional stratification. In SDKI 2017, a total of 1,970 clusters were sampled by the Central Statistics Agency from the 2010 census sampling frame. Out of these, 47,963 households were successfully interviewed, and 49,627 women of reproductive age (15–49 years) were interviewed.[2]

Women were interviewed about all births in the last five years. The research analysis is confined to births of children under five years old from women aged 15-24 years (n=3,158). The interview questions included consistency checks to ensure that respondents' answers were consistent, making the study representative and reducing potential recall bias in the acquisition of original answers. If respondents forgot, the option "don't know" was also provided in subsequent questions. Respondents who answered "don't know" were then excluded from our research analysis.

2.2. Measurement and Scale

The DHS questionnaire encompasses various demographic and health-related data. In this study, the questionnaire used is related to data on all eligible women aged 15-24 years and their children under five years, as well as a questionnaire on indicators of illness and LBW status of children under five years.

2.3. Independent Variables

The primary explanatory variable is a child under five born to a mother aged 15-19. The mother's age is further categorised into two groups: 20-24 years (adult women of reproductive age) and 15-19 years (adolescent women) to capture potential vulnerabilities that may occur for mothers who conceive and give birth during adolescence.

2.4. Dependent Variables

In total, four indicators related to morbidity and LBW status of children under five years were examined concerning their association with the current age of the mother. These include:

2.4.1. Morbidity Indicators

- Fever in the last two weeks: Evaluation was conducted by inquiring whether the child had encountered fever in the preceding two weeks, designated as "1=yes" and "0=no."

- Cough in the last two weeks: Evaluation involved questioning whether the child had experienced a cough within the past two weeks, designated as "1=yes" and "0=no."
- Acute Respiratory Infection (ARI) in the last two weeks: Assessment included inquiring whether the child had displayed rapid or difficult breathing during the previous two weeks, designated as "1=yes" and "0=no."
- Diarrhea in the last two weeks: Assessment was performed by inquiring whether the child had suffered from diarrhea in the preceding two weeks, designated as "1=yes" and "0=no."

2.4.2. LBW Indicator

- LBW was determined by inquiring about the weight of the child at birth, coded as "1=Yes if the baby was born with a weight of <2500 grams" and "0=no if the baby was born with a weight ≥2500 grams."

2.4.3. Covariates Indicator

- Children's age was defined by the length of life of children under five years old when the study was conducted, including children under one year, with open-ended questions.
- Gender was inquired using answer choices "1=male" and "2=female".
- The type of residence was determined with answer choices "1=urban" and "2=rural".
- The mother's education level is defined as the highest level of education attained by mothers, with answer choices "1=SD/MI equivalent", "2=SMP/MTs/equivalent", "3=SMA/SMK/MA equivalent", "4=AKADEMI/DI/DII/DIII", and "5=DIPLOMA IV/UNIVERSITY".
- The adequacy of antenatal visits during pregnancy was assessed by inquiring about the total number of prenatal check-ups. Additionally, a consistency check was performed with more detailed questions regarding the number of check-ups in the first three months, between 4 and 6 months, and between 7 months until delivery.

Table 1. Demographics of Births in the Last 5 Years Among Females Aged 15-24 in Indonesia, Based on the Mother's Age Group During the Study

	Total births (n=2862) **N (%)**	Births to women aged 15-19 years (n=370) **N (%)**	Births to women aged 20-24 years (n=2492) **N (%)**	P-value
Sex of child				
Male	1427 (49,9)	182 (49,2)	1245 (50)	0,782

Female	1435 (50,1)	188 (50,8)	1247 (50)	
Antenatal visits				
No (<4)	348 (12,2)	75 (20,3)	273 (11)	0,000
Yes (>3)	2862 (87,8)	295 (79,7)	2219 (89)	
Type of residence				
Urban	1281 (44,8)	159 (43)	1122 (45)	0,459
Rural	1581 (55,2)	370 (57)	2492 (55)	
Mother's education level				
No education or primary	522 (18,2)	89 (24,1)	433 (17,4)	0,002
Secondary or higher	2340 (81,8)	281 (75,9)	2059 (82,6)	

The data represents the weighted percentage of participants in each subsample, while the figures indicate the absolute number of participants. The final participant count may not align precisely with the rates as the percentages are weighted.

2.5. Statistical Analysis

All analyses were specifically confined to births involving women aged 15-24 years within the preceding five-year period. Descriptive statistics delineated the demographic characteristics of both mothers and children, conducting comparisons based on maternal age categories (15-19 years vs. 20-24 years) utilising Chi-square tests and logistic regression analysis (as presented in Table 1). Logistic regression analysis, incorporating the sampling design to address the clustering of twin births within the same mother at the household level, was utilised to ascertain the odds of morbidity and the LBW index in children across maternal age categories (15-19 years vs 20-24 years). This analysis was conducted both before and after adjusting for maternal and child sociodemographic factors (refer to Table 2).

Adjusted models for fever, cough, ARI, and diarrhea outcomes were exclusively applied to children who were still alive and under the age of five, taking into consideration child gender, maternal education, and place of residence. Adjusted models for the LBW index encompassed all births that occurred within the past five years, accounting for child gender, maternal education, and place of birth. The analytical approach incorporated rigorous consideration of potential confounding variables to enhance the robustness of the findings. In addition to the covariates above, the review of an insufficient number of antenatal care visits during pregnancy is incorporated. Given the prevailing evidence indicating an elevated risk of morbidity and low birth weight in infants associated with a diminished maternal age during pregnancy [11], a supplementary model was formulated to juxtapose the morbidity index and low birth weight in infants among diverse maternal age strata when delivering a child under the age

of 5 years (15-19 years vs 20-24 years). The outcomes are elucidated through Odds Ratios (OR) and Adjusted Odds Ratios (AOR) with a 95% confidence interval (95% CI). All the analytical procedures were executed employing SPSS version 25.

Results

1.1. Sociodemographic Characteristics of Children Under 5 Years, IDHS 2017

A total of 2,862 births from women aged 15-24 years were included in the final analysis, of which 370 (12.93%) were born to teenage mothers aged 15-19 years, and 2,492 (87.07%) were births from adult women aged 20-24 years. Similarly, as shown in Table 1, the proportion of children born to adult women (20-24 years) is higher compared to those born to teenage women (15-19 years). The gender distribution of children, both from births to teenage and adult women, is almost identical. Residential locations do not significantly differ between deliveries from teenage and mature women, with the percentage of children living in rural and urban areas being nearly the same for both groups (refer to Table 1).

Mothers with secondary or higher education levels have a higher proportion compared to mothers with primary or no education. Secondary and higher education levels are significantly higher in adult women than in teenage women (82.6% vs. 75.9%, P-value=0.002). There are 20.3% of women aged 15-24 years who did not have adequate ANC visits during their recent pregnancies, and the rate of good ANC is significantly higher in pregnancies of adult women compared to teenage pregnancies (89% vs. 79.7%, P-value=0.000).

Table 2. Relationship between teenage pregnancy and the incidence of morbidity and low birth weight among births to women aged 15-24 years in the last five years in Indonesia (n=2862)

Health outcomes	Total births (n=2862)	Births to women aged 15-19 years (n=370)	Births to women aged 20-24 years (n=2492)	COR (95% CI)	AOR (95% CI)$_A$	AOR(95% CI)$_B$
Fever (past two weeks)				0,968 (0,741-1,266)	0,960 (0,734-1,256)	0,944 (0,720-1,237)
No	1885 (65,9)	238 (64,3)	1647 (66,1)			
Yes	977 (34,1)	132 (35,7)	845 (33,9)			
Cough (past two weeks)				1,007 (0,765-1,324)	1,007 (0,766-1,326)	0,983 (0,746-1,296)

No	1724 (60,2)	220 (59,5)	1504 (60,4)			
Yes	1138 (39,8)	150 (40,5)	988 (39,6)			
ARI (past two weeks)				1,067 (0,728-1,565)	1,093 (0,744-1,605)	1,120 (0,761-1,648)
No	2530 (88,4)	327 (88,4)	2203 (88,4)			
Yes	332 (11,6)	43 (11,6)	289 (11,6)			
Diarrhea (past two weeks)				0,720 (0,551-0,942)*	0,727 (0,555-0,951)*	0,728 (0,555-0,954)*
No	2319 (81,0)	282 (76,2)	2037 (81,7)			
Yes	543 (19,0)	88 (23,8)	455 (18,3)			
LBW				1,311 (0,923-1,861)	1,314 (0,924-1,867)	1,233 (0,864-1,758)
No	2600 (90,8)	328 (88,6)	2272 (91,2)			
Yes	262 (9,2)	42 (11,4)	220 (8,8)			

The data represents the weighted percentage of participants in each subsample, while the figures indicate the absolute number of participants. The final participant count may not align precisely with the rates as the percentages are weighted.

*p < 0,05

Adjusted Odds Ratio (AOR_A) for child gender, residential type, and maternal education.

Adjusted Odds Ratio (AOR_B) for child gender, residential type, maternal education, and ANC sufficiency.

1.2. Prevalence Index of Morbidity in Toddlers and its Relation to Teenage Pregnancy Considering the Current Age of Mothers

The prevalence of fever, cough, ARI, and diarrhea in the past two weeks is 34.1%, 39.8%, 11.6%, and 19%, respectively, among children under five years. There is no notable difference in the rates of fever, cough, and ARI in the past two weeks between children born to adolescent mothers (15-17 years) and mature mothers (20-24 years) (refer to Table 2). However, a significant distinction in the diarrhea incidence rate is observed between births from adolescent mothers (15-19 years) compared to those from mature mothers (20-24 years), even after adjusting for sociodemographic factors and ANC adequacy (COR=0.720, 95% CI: 0.551-0.942; AORA=0.727, 95% CI: 0.555-0.951, and AORB=0.728, 95% CI: 0.555-0.954). Moreover, in the age-group analysis (15-16, 17-18, 19, ≥20), a notable difference in the diarrhea incidence rate is identified between births from women aged 17-18 years compared to those from women with older ages, even after adjusting for sociodemographic factors and ANC adequacy (COR=0.644, 95% CI: 0.445-0.933; AORA=0.640, 95% CI: 0.442-0.929, and AORB=0.643, 95% CI: 0.444-0.933) (refer to Tables 2 and 3).

Nearly 10% of children born to women aged 15-24 experience LBW. It appears that there is no significant difference in the status of LBW among children and the current age of the mother.

However, in the analysis concerning age grouping (15-16, 17-18, 19, ≥20), a significant difference in LBW status is observed between births from women aged 17-18 compared to births from women of older ages, even after adjusting for sociodemographic factors and ANC adequacy (COR=1.952, 95% CI: 1.265-3.014; AORA=1.981, 95% CI: 1.282-3.062, and AORB=1.887, 95% CI: 1.218-2.926) (refer to Tables 2 and 3).

Discussion

To the best of our knowledge, this study is the first to investigate sociodemographic factors and the correlation between teenage pregnancy and morbidity, as well as LBW status in 5-year-old children born to women aged 15-24 in Indonesia. This research utilises data from the 2017 IDHS. The findings reveal that more than 10%, precisely 12.9%, of births to women aged 15-24 are linked to teenage mothers aged 15-19. It's worth noting that the majority of these births occur in rural areas. Similar findings were also reported in Afghanistan.[10] A study on factors contributing to teenage pregnancy in East Africa and Sub-Saharan Africa stated that adolescent girls with middle and high education have lower chances of early pregnancy [13,14]. However, in this study, the majority of births from teenage mothers have middle and high education. This aligns with findings in Brazil, stating that teenagers aged 15-20 are primarily in central and post-school education, emphasising the need to complete their studies. Therefore, the literacy level regarding teenage pregnancy, including the adverse effects of adolescent pregnancy, remains low.

Based on our findings, teenage pregnancy before the age of 19 increases the likelihood of diarrhea in children born to adolescent mothers, both in the unadjusted model and the adjusted model. This finding aligns with research conducted in Pakistan, which stated that births from women under 18 years old are more likely to result in diarrhea [15]. Another study conducted in Bangladesh, focusing on births of children under five years old from women aged 15-49, found similar results, showing a higher rate of diarrhea in children born to teenage mothers (<18 years old) compared to adult women.[16]

In this study, except for diarrhea, other morbidity indices, including cough, ARI, and fever, did not differ significantly between children born to teenage mothers (15-19 years) and adult mothers (20-24 years). One of the findings of this research differs from a study conducted in Bangladesh, which found that younger maternal age (<18 years) is significantly associated with the incidence of ARI in their children.[16] As for LBW status, there was no significant difference between births from mothers aged 15-19 years and 20-24 years. However, when comparing between age groups, there was a substantial difference in LBW status between infants born to mothers aged 17-18 years. This finding is supported by research in Malawi,

which found that the prevalence of LBW was 37.5% higher in women under 20 years old.[17,18] Similarly, a study in Bangladesh on births of children under five years old from women aged 15-49 found that children born to teenage mothers (<18 years old) were more likely to have LBW status compared to adult women. This could be due to the limited nutrient reserves stored in the bodies of teenage mothers, becoming a factor in the occurrence of LBW in their children.[16]

Table 3. Relationship between the Current Age of Mothers and the Incidence of Morbidity and Low Birth Weight in Births from Women Aged 15-24 Years Based on Age Groups in the Last 5 Years in Indonesia

Health outcomes	OR (95% CI)	AOR (95% CI)$_A$	AOR (95% CI)$_B$
Fever (past two weeks)			
15-16	1,288 (0,491-3,376)	1,279 (0,487-3,357)	1,237 (0,465-3,287)
17-18	0,861 (0,586-1,264)	0,852 (0,580-1,251)	0,838 (0,570-1,233)
19	1,038 (0,716-1,504)	1,031 (0,711-1,495)	1,019 (0,702-1,479)
≥20	Reference	Reference	Reference
Cough (past two weeks)			
15-16	0,828 (0,304-2,251)	0,830 (0,305-2,259)	0,774 (0,282-2,128)
17-18	1,503 (0,998-2,264)	1,507 (0,999-2,273)	1,485 (0,983-2,244)
19	0,724 (0,500-1,048)	0,726 (0,502-1,051)	0,709 (0,489-1,029)
≥20	Reference	Reference	Reference
ARI (past two weeks)			
15-16	0,568 (0,177-1,825)	0,581 (0,181-1,870)	0,614 (0,189-1,992)
17-18	0,930 (0,527-1,640)	0,941 (0,533-1,662)	0,955 (0,540-1,689)
19	1,322 (0,773-2,260)	1,364 (0,797-2,334)	1,393 (0,813-2,387)
≥20	Reference	Reference	Reference
Diarrhea (past two weeks)			
15-16	0,619 (0,249-1,539)	0,627 (0,252-1,559)	0,627 (0,252-1,563)
17-18	0,644 (0,445-0,933)*	0,640 (0,442-0,929)*	0,643 (0,444-0,933)*
19	0,880 (0,598-1,296)	0,896 (0,608-1,320)	0,898 (0,609-1,324)
≥20	Reference	Reference	Reference
LBW			
15-16	0,823 (0,193-3,518)	0,808 (0,189-3,456)	0,681 (0,158-2,939)
17-18	1,952 (1,265-3,014) z	1,981 (1,282-3,062) z	1,887 (1,218-2,926) z
19	0,789 (0,441-1,410)	0,785 (0,439-1,404)	0,742 (0,413-1,331)
≥20	Reference	Reference	Reference

*P<0,05

zp<0,01

Adjusted Odds Ratio ($_A$AOR) for child gender, residential type, and maternal education.

Adjusted Odds Ratio ($_B$AOR) for child gender, residential type, maternal education, and ANC sufficiency.

Several limitations exist in this study, particularly the lack of detailed information regarding the factors causing morbidity and LBW as confounding variables. The analysis employed in this study is cross-sectional, preventing causal inferences. However, the findings can serve as a hypothesis since teenage pregnancy occurs before the onset of illness and LBW in the offspring. DHS data is obtained by prioritising respondent recall, introducing the possibility of recall bias. Previous research has linked factors such as weight gain[19] and maternal anaemia status[20] to LBW in infants. However, due to the absence of this information in DHS data, these variables cannot be controlled in the adjusted research model. Additionally, other factors like toilet ownership[21,22], unprotected drinking water sources, and the availability of handwashing facilities[22], which may contribute to diarrhea in children under five years, were not included as confounding variables in the regression analysis.

The findings are limited to adolescent females aged 15-24 years, and therefore, the results of this study cannot be generalised to other age groups in Indonesia. These results can be utilised to plan various health programs focusing on teenage pregnancy to address and prevent diarrhea and LBW in children under five years. Interventions could include promoting a higher age of marriage, being known to influence teenage pregnancy and previously identified as a cause of diarrhea and LBW[23,24] and delaying childbirth during adolescence.

Conclusion

The research results indicate that teenage pregnancy has a detrimental impact on health, specifically increasing the likelihood of diarrhea in the children born, even after adjusting for confounders, and the observed differences remain significant. In this study, except for diarrhea, other morbidity indices, including cough, ARI, and fever, did not differ significantly between children born to teenage mothers (15-19 years) and adult mothers (20-24 years). Regarding LBW status, there was no significant difference between births from mothers aged 15-19 years and 20-24 years. However, when comparing between age groups, a substantial difference in LBW status was found between infants born to mothers aged 17-18 years. This could be attributed to the limited nutrient reserves stored in the bodies of teenage mothers, becoming a contributing factor to LBW in their children [16]. Addressing adolescent pregnancy requires collaboration across all sectors, especially within the government, to formulate appropriate policies aimed at reducing teenage pregnancy rates in Indonesia. Additionally, interventions could be a solution, particularly in lowering morbidity and LBW rates associated explicitly with adolescent pregnancies. Nonetheless, further long-term research is needed to ascertain the exact factors influencing morbidity rates and LBW occurrences in mothers with children.

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