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Analysis of the Relationship between Adolescent Pregnancy and the Incidence of Preterm Labor at Kalirejo Health Center, Katon District, Pesawaran Regency

Ratna Derwi Puspita Sari¹, Sutarto^{2*}, Winda Trijayanti Utama³

Abstract

Preterm labor refers to labor occurring before 37 weeks of gestation, or between 20 and 37 weeks of gestation. Adolescent pregnancy is one of the risk factors for preterm birth. If a teenager's gestational age is less than 20 years old, it is more likely that a premature baby will be born. In the work area of the Callejo Health Center, there has been an increase in teenage pregnancies and premature births compared to last year. Based on this, this study was conducted to determine the association between adolescent pregnancy and the incidence of preterm birth in the work area of Calilejo Health Center, Pesavalan District. This research method uses an analytical descriptive design with a cross-sectional approach. Case sampling used a method of summing the preterm birth event population of 33 individuals, and an equal number of control samples were drawn from all normal (nonpreterm) births by simple random sampling. Secondary data on medical records of midwifery practices in obstetrics and maternity services were used for this data. Data analysis using the scientific squares test is presented in a 2x2 matrix. The results showed that there was a link between adolescent labor and the frequency of preterm birth. The occurrence of preterm birth in adolescent mothers may be due to insufficient blood flow to the cervix and uterus. This blood flow is often poorly developed, which can reduce the flow of nutrients to the fetus and increase the risk of infections that can lead to premature birth. The results of this study should be taken up by responsible health authorities to increase the level of knowledge regarding the management of pregnancy in adolescents.

Keywords: Teenage Pregnancy, Pregnancy Management, Preterm Labor.

Introduction

According to Indonesian Demographic and Health Survey Data, Indonesia's maternal mortality rate (MMR) in 2002 – 2007 from 228 per 100,000 live births increased to 359 per 100,000 live births in 2007 – 2012, then MMR decreased in 2012 – 2015 to 305 per 100,000 live births with the number of maternal deaths in 2019 was 4,221 cases. (Ministry of Health of the Republic of Indonesia, 2018) The prevalence of preterm birth has increased from 7.5% to 8.6% worldwide. Indonesia ranks fifth for the highest number of preterm births, with approximately 657,700 (Kenneth Chay et al., 2004; Ohashi et al., 2022; Wagura et al., 2018). The main cause of preterm birth is the high prevalence of infections and sexually transmitted diseases caused by teenage pregnancy. According to the results of the Basic Health Survey in 2018, the proportion of preterm births in pregnancies between the ages of 10 and 54 reached 29.5%, of which 26.8% occurred in urban areas and 32.7% in rural areas. In the overall population, 35.8% of pregnancies occur before the age of 15 years and 19.8% occur in the younger age group (10–19 years). (Ministry of Health, 2018)

¹Medical Professional Study Program, Faculty of Medicine, University of Lampung, Bandar Lampung, 35145, Indonesia

²Medical Education Study Program, Faculty of Medicine, University of Lampung, Bandar Lampung, 35145, Indonesia. Email: sutarto@fk.unila.ac.id

³Medical Education Study Program, Faculty of Medicine, University of Lampung, Bandar Lampung, 35145, Indonesia.

Preterm labor is defined as labor that occurs at less than 37 weeks' gestation (pregnancy between 20 weeks to from 37 weeks). Preterm labor complications are the leading cause of death for children under 5 years of age and cause about 1 million deaths annually. Various risk factors for (Larasati et al., 2018) *preterm labor* have been found, such as maternal diseases during pregnancy, young gestational age, multiple pregnancies, physical and mental stress, placental abnormalities, nutritional, medical, infectious. Epidemiology of *preterm labor* can be related to socioeconomic, uterine anomalies, history of previous preterm labor, history of abortion, smokers, race, and extreme maternal age, namely <20 years and >35 years (Honorato et al., 2021; Uzunov et al., 2022).

Teenage pregnancy negatively affects the health status of the mother and her baby, it can also have social and economic impacts. Pregnancy at a young age or adolescence includes the risk of premature birth, low birth weight, labor bleeding, which can increase maternal and infant mortality. Teenage pregnancy is also associated with unwanted pregnancies and unsafe abortions (Ministry of Health, 2018)

Young birthing mothers had a higher proportion of preterm births at 27.7% compared to adult births at 13.1%. Mothers who gave birth young had a low birth weight (BBLR) of 38.9% compared to adult births of 30.4% (4). The research was conducted by Ondang *et al.* (2016) found that the percentage of diseases or premature labor of adolescents that complicate at this age is the highest cases of premature rupture of membranes (12.90%), preeclampsia / eclampsia (6.45%), fluorine albus (3.22%), and anemia (3.22%). Based on the level of adolescent preterm labor education in Pesawaran Regency, there were 20 cases of high school education (64.51%), 8 cases of junior high school (25.80%) and 3 cases of elementary school (9.67%). (Pesawaran, 2017) One effort to reduce cases of *preterm labor* in pregnant women is to pay attention to the mother's gestational age. Preterm labor can occur due to teenage pregnancy which can cause various complications in pregnancy and childbirth. From the description above, the rumsuan problem taken is how the relationship between teenage pregnancy and the incidence of preterm labor at the Kalirejo Health Center, Negri Katon District, Pesawaran Regency.

The aim of this research was to investigate the correlation between adolescent pregnancy and the occurrence of preterm labor at Kalirejo Health Center in Negri Katon District, Pesawaran Regency. The significance of this study lies in its potential to serve as educational material and a point of reference for researchers and local authorities interested in understanding the link between teenage pregnancy and the prevalence of preterm labor in the specified region. The findings from this investigation are anticipated to contribute valuable insights to the health office, serving as informative input for the development of strategies to enhance awareness among adolescents. This could be achieved through targeted education initiatives focusing on maternal and child health.

Method

This research adopts an analytical descriptive approach employing a cross-sectional research design to explore the association between risk factors and the occurrence of premature births among adolescent mothers at Kalirejo Health Center, Negri Katon District, Pesawaran Regency. The study encompasses mothers who gave birth during the 2022 period, dividing them into two groups: the preterm labor case population and the control population consisting of mothers who did not experience preterm labor in the same period. The sampling strategy involves including all cases in the case population, maintaining a 1:1 case-control ratio.

Statistical analysis employs the chi-square test with a 2x2 matrix. Primary data for this research are sourced from interviews conducted with groups of pregnant women within the operational area of Kalirejo Health Center in Negri Katon District, Pesawaran Regency. The study aims to provide valuable insights into the relationship between risk factors and premature births among adolescent mothers, utilizing a comprehensive and methodical analytical approach.

Results and Discussion

Kalirejo Health Center stands as one of the 30 health centers in Pesawaran Regency, offering a spectrum of health services encompassing medical examinations, referrals, issuance of health certificates, and comprehensive maternal and child health services. This health center actively implements various health programs, including routine health check-ups, the issuance of health certificates, outpatient services, postoperative wound care, and a range of additional services such as tooth extraction, blood pressure monitoring, pregnancy assessments, child growth and development evaluations, as well as blood type, uric acid, and cholesterol checks. Moreover, Kalirejo Health Center plays a pivotal role in facilitating referrals for patients, particularly those seeking follow-up care at hospitals within the BPJS network, stemming from maternal health services. Equipped with qualified medical personnel, including nurses and doctors, and furnished with complete medical equipment and medications, the health center is committed to delivering quality healthcare services. Consequently, it has become a preferred choice for the residents of Pesawaran Regency, particularly in Negri Katon District, meeting their diverse health needs effectively.

Kalirejo Health Center, located in Kalirejo Village, Katon State District with health service work areas covering the villages of Keagungan Ratu, Kalirejo, Purworejo, Pujo Rahayu, Katon State, Tanjung Rejo, Karang Rejo, Halangan Ratu, Pejambon State, Saka State and Ulangan Jaya State in Katon State District and oversees the Pejambon Assistant Health Center and Tanjung Rejo Auxiliary Health Center.

Table 1: Respondent Statistical Data.

No.	Description	n	%
A	Age Group		
1	14 – 17 years old	3	4,5
2	18 – 20 years	27	40,9
3	More than 20 years	36	54,5
B	Age Group		
1	Adolescent	30	45,0
2	No Teenagers	36	55,0
	Entire	66	100,0

As depicted in Table 1, the interview findings present the distribution of age groups, delineating that the age cohort of 14 – 17 years constitutes 4.5% of the overall population or sampled individuals. Similarly, the age group of 18 – 20 years comprises 40.9%, indicating that nearly 40.9% of the population or sample falls within the age bracket of 18 – 20 years. The age group surpassing 20 years stands out as the largest category, constituting 54.5%. This signifies that approximately 54.5% of the entire population or sample falls into the age category above 20 years.

These percentages offer insights into the age distribution within the measured sample, serving as valuable data for demographic analysis. Furthermore, this information proves beneficial for planning targeted programs tailored to specific age groups, enabling a more nuanced and effective approach to address the diverse needs of the population.

Table 2: The Results of The Examination of The Relationship Between Pregnancy At Adolescence and The Incidence of Preterm Labor At The Kalirejo Health Center.

Age Class	Age at childbirth				Entire	p-Value
	Premature		Aterm			
	n	%	n	%		
Adolescent	25	83,3%	5	16,7%	33	0,001
Not a Teenager	8	22,2%	28	77,8%	33	

Sum	33	50,0%	33	50,0%	66
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In Table 2, this data is a contingency table that illustrates the relationship between maternal age class at childbirth (Adolescent Adolescent and Non-Adolescent Adolescents) and infant birth status (Preterm and Aterm). There were 25 cases (83.3%) of preterm birth and 5 cases (16.7%) of full-term birth in the non-adolescent group. There were 8 cases (22.2%) of preterm birth and 28 cases (77.8%) of preterm birth and a total of 33 cases of preterm (50.0%) and 33 term cases (50.0%) in this sample.

The obtained p-value of 0.001 from the statistical test serves as an indicator of the significance in assessing the association between the mother's age group at childbirth and the baby's birth status. The remarkably low p-value (0.001) strongly suggests a statistically significant relationship between the mother's age at delivery and the birth status of the baby. Drawing conclusions from these findings, it can be inferred that the Adolescent group exhibits a higher percentage of preterm births, while the Non-Adolescent group demonstrates a higher percentage of full-term births. These results bear significance in the realm of maternal and infant health planning and healthcare. The observed correlation between maternal age and birth outcomes can contribute valuable insights for designing targeted interventions and strategies to address the unique needs of both adolescent and non-adolescent mothers. This information holds potential implications for enhancing prenatal care, promoting healthy pregnancies, and tailoring support systems to specific age groups, thereby fostering improved maternal and infant health outcomes.

The ideal age for marriage for women is 21-25 years, while for men it is 25-28 years. This is recommended because in adulthood, female reproductive organs have achieved good physical development, strong, and ready to give birth. Similarly, in men in the age range of 25-28 years, they are expected to be financially and emotionally ready to support their family life. However, in reality, many women and men marry at a younger age, which is often referred to as early marriage. The incidence of early marriage often occurs in different parts of the world with diverse backgrounds. Young or teenage pregnancy is a pregnancy experienced by a woman under the age of 20 years. Pregnancy can be caused by sexual intercourse with a boyfriend, sexual intercourse with a husband, rape, or other factors causing pregnancy. If a mother is less than 20 years old in her first pregnancy, her uterus and pelvis often do not grow to adult size, raising questions about the safety and health of the fetus in her womb. The mother's psychological condition is also immature so it is unlikely that she will be able to take care of herself or her baby. Factors causing teenage pregnancy include the amount of information that encourages sexual relations between adolescents and adolescents, as well as the rise of early marriage. The incidence of premature birth is greatly influenced by the age of the mother at the time of pregnancy. The risk of pregnancy complications also increases physically between the ages of <20 and <35 years, thus impacting fetal morbidity and mortality (Dewi & Son, 2020; Rachmantiawan & Rodiani, 2022; Wahyuni & Rohani, 2017)

Preterm birth is often associated with an increased risk of intra-amniotic infection, which can trigger inflammation in the mother's body. A study shows that about 20-30% of women who go into preterm labor have a positive culture result for amniotic fluid. Gestational age factors also play an important role, with intra-amniotic infection rates tending to increase as gestational age decreases. More than 85% of neonates born at a gestation period of less than 28 weeks reported chorioamnionitis. Further research suggests that inflammation in the mother's body, such as increased levels of interleukin 6 in amniotic fluid, may be associated with adverse perinatal outcomes. The inflammatory response of the fetus is also an important factor, where increased interleukin 6 in plasma can cause fetal inflammatory response syndrome. This can contribute to the risk of neurological injury to the fetus. Therefore, a deep understanding of the complex relationship between preterm birth, intra-amniotic infection, and inflammation in the mother can provide important insights for better prevention and perinatal care efforts. (Sandya, Puspitasari, Studi, et al., 2018)

The incidence of prematurity in pregnancy is often triggered by maternal characteristics associated with

poor socioeconomic status, such as low income, limited education levels, resulting in inadequate nutritional patterns. In addition, age also plays an important role, with the risk of premature pregnancy increasing which occurs at the age of 16 years or in primigravida aged more than 30 years. The factors that cause the risk of preterm labor (less months) can be grouped based on the age of the mother. Mothers who become pregnant at a relatively young age, under 20 years old, can face the risk of prematurity because their reproductive organs have not achieved optimal development and physiological function. Psychologically, they may also not have reached enough emotional maturity to understand and handle pregnancy, which in turn affects preparation and care during pregnancy. This can have a negative impact on the development of the fetus conceived, and be one of the factors increasing the risk of preterm labor. Conversely, mothers who become pregnant at a later age, especially over 30 years, also have a high risk for preterm labor. This is due to a general decline in physiological and reproductive functions at that age. In addition, older mothers may have a history of obstetrics such as previous preterm labor, miscarriage, or being an older primiparous mother (giving birth to their first child after age 35). This obstetric history can also increase the risk of preterm labor. Being too young or too old during pregnancy can affect the risk of preterm labor through various mechanisms that include both physiological and psychological aspects. Therefore, it is important to give special attention and proper medical care during pregnancy in this age group to reduce the risk of preterm labor (Wahyuni & Rohani, 2017; Imron & Oktaviana, 2012)

The occurrence of preterm labor is not uncommon in teenage pregnancies or pregnancies at an early age. Adolescent pregnancies elevate the risks of health complications and mortality for both the mother and the baby, primarily due to the increased likelihood of premature birth. The mechanism underlying preterm labor shares similarities with term labor, involving processes such as uterine contractions, cervical maturation, and membrane rupture. Understanding these aspects is crucial for addressing the unique challenges associated with early pregnancies and implementing effective preventive measures to promote the well-being of both mother and child. The difference lies in the activation of the labor process. In term labor, this activation is part of normal physiological processes, whereas in preterm labor, such activation is pathological. The incidence of preterm labor in adolescent mothers is also associated with lack of blood circulation to the cervix and uterus. In adolescents, this circulation often doesn't develop fully, which can reduce the flow of nutrients to the fetus and increase the risk of infections that can lead to preterm labor. Sex hormones that are active during puberty can also contribute to menstrual irregularities in adolescents. Some teens who become pregnant may not be aware of their pregnancy because they experience bleeding that they mistake for irregular periods. This may result in delays in prenatal check-ups. In addition, nutrition also plays an important role in teenage pregnancy. They still need adequate nutrition for their own growth, while also having to support fetal growth. Pregnancy in adolescence can require special attention regarding nutrition and medical care to ensure optimal fetal development (Imron & Oktaviana, 2012).

The age of the mother during pregnancy affects the health of the mother and the development of the fetus. At the age of under 20 years, the reproductive organs, including the uterus, are not yet fully formed and well developed. In addition, the uterus may still be relatively small because the formation process has not been completed, and the pelvic bones may not have reached a sufficient width. This can result in a high risk of pregnancy complications, such as preterm labor. In addition, mothers who are still in the growth stage may not get enough food intake for themselves and the fetus, which can adversely affect fetal growth. At the age of over 35 years, the risk of pregnancy complications increases. Older women tend to face a higher risk of problems such as hypertension, gestational diabetes, and other pregnancy complications. This can result in higher morbidity (disease) in both mother and baby, as well as a higher risk of death in the soon-to-be-born baby. In terms of cost, complications related to

prematurity can incur additional costs to health services after the initial hospitalization not only consumes more healthcare resources but also has higher long-term costs (Sandya, Ratna, & Puspitasari, 2018; Sandya, Puspitasari, Obstetri, et al., 2018; Princess & Dew, 2016; Cavallo et al., 2015)

Conclusion

Preterm labor in teenage pregnancies can be attributed to a diverse range of factors, encompassing aspects such as circulation, hormonal fluctuations, and nutritional considerations. Hence, it becomes imperative to provide comprehensive medical care and support to mitigate the risk of preterm labor in the adolescent population. The age of the mother during pregnancy emerges as a critical determinant influencing fetal development, overall health, and the occurrence of pregnancy complications. Consequently, irrespective of maternal age, ensuring proper prenatal care and medical monitoring is indispensable. This proactive approach is crucial not only to minimize the risk of preterm labor but also to safeguard the health and well-being of both the mother and the baby throughout the course of pregnancy.

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