Relationship between Mother's Status Too Young, Too Old, Too Close, Too Much (4T), and Contraceptive Use with Incidence of Maternal Mortality

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Abstract

Maternal Mortality Rate in Bojonegoro Regency in 2019 ranked second in East Java, namely 146.64 per 100,000 Live Births. Meanwhile, in the first semester of 2020, there were 24 maternal deaths. This research was conducted to see the relationship between the mother's status is too young, too old, too much, and too close (4T) to Maternal Death. This study analyzed quantitative secondary data for the first semester of 2020 in Bojonegoro Regency using the Risk Ratio (RR) calculation with a significance level of 95% CI. A mother with age too old will likely cause maternal death with RR= 0.443. Mothers with too many children have a risk of dying with RR= 3.153. A mother with the child's birth spacing is too close has a risk of dying with RR= 1.05. Analysis of maternal mortality based on mothers with 4T who use contraception is that they risk breaking with RR = 19.3, 5. The status of mothers with 4T can be a risk factor for maternal mortality, so it is necessary to monitor and prevent it with a family planning program.

Keywords*: Mother's Status, Too Young, Too Old, Too Much, Too Often, Maternal Mortality, Family Planning*

Introduction

Mother too young, too old, too often, too many children abbreviated as a mother with 4T. The first 4T mothers are mothers who get pregnant at a too young age; that is, they become pregnant when they are less than 20 years old. Second, mothers who get pregnant at too old are pregnant at more than 35 years. Third, mothers whose pregnancies are too close to each other; that is, the distance between their children's births is less than two years and too frequent. Fourth, mothers who have children live more than 3 or 4 children. Mothers with 4T can also cause maternal death due to various complications they experience[1]. In Bojonegoro Regency, in the first semester of 2020, there were 24 maternal deaths, among which were caused by mothers with 4T who did not use contraception.

There are three risk factors for the determinant of maternal mortality, namely the proximate determinant, the intermediate determinant, and the far determinant[2]. Close determinants are direct factors that can cause maternal death, including complications experienced by mothers during pregnancy, childbirth, and the puerperium—for example, bleeding, eclampsia, infection, uterine rupture, and prolonged participation. The determinants of maternal health status are reproductive status, access to health services, healthy behavior, and other unknown or suspected factors. Maternal health status includes nutritional status, history of pregnancy complications, previous history of labor, and maternal illness history. Reproductive status consists of parity, age, and birth spacing. Access to health services includes the availability of health facilities and access to affordability, distance, and time for healthy behavior, including antenatal care (ANC) [2].

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Remote determinants include the mother's status in the family, the mother's position in the community, and the family's status in the community. The mother's status in the family includes education, occupation, marital status, and mother status in society.

According to East Java Province's health profile in 2019, Bojonegoro Regency is the second-highest in East Java after Situbondo, which is 149.66 per 100,000 live births, and in 2020 the first semester, there were 24 maternal deaths and 9,119 live births. A total of 24 maternal deaths were partly mothers with 4T. Meanwhile, in the first semester of 2020, the number of mothers was 212,843, and mothers with 4T were 117,983 people. This study aims to analyze mothers' relationship with 4T and contraceptive use with maternal mortality in Bojonegoro Regency in 2020, especially in January to June 2020.

Materials and Methods

This research design is a non-reactive study because the researchers conducted quantitative secondary data analysis based on monthly report data and incidental reports from the Bojonegoro District Health Office from January to June 2020. This study was to describe the relationship between mothers with 4T and contraceptive use with the incidence of maternal mortality in Bojonegoro Regency. The sample was 117,983 mothers with 4T. The total number of mothers with 4T who died were 12 mothers, and those who were still alive were 117,971 mothers. The analysis of data using RR calculation on the Epi-info application with a significance level of 95%. If there is no confidence interval between the range of 1.0, it means that there is a significant relationship.

Results and Discussion

Table 1.Analysis of maternal mortality with 4T based on mother's age too young (< 20 years)

Mothers' Age Too Young	Died	Not Died	Total	RR (95% CI)
Yes	0 (0,0)	2,583 (2.6)	2,583 (2.7)	0,000
No	26 (100.0)	94,836 (97.4)	94,860 (97.3)	
Total	26 (100.0)	97,419 (100.0)	97,443 (100.0)	

The analysis of maternal mortality with 4T based on the mother's age too young (< 20 years) showed that mothers with 4T who were too young did not die. None of the mothers with 4T who died were too young, with a Risk ratio (RR) of 0.00. These results indicate the value of RR <1which means it has a protective effect against disease. The protective effect here means that mothers with 4T who are too young (< 20 years) have no chance of causing maternal death (Table 1).

Women who are too young (aged less than 20 years) cannot be physically ready to get pregnant or undergo a reproductive process. First, pregnant women at ≤ 16 years of age have a high risk of experiencing maternal death because the mother's uterus and pelvis have not yet grown to adult size. As a result, the safety and health of the fetus in the womb is doubtful. Besides, the mother's mental state is not mature enough, so that her skills in self-care and her baby are also doubtful. This study's results are consistent with research in West Sumatra Province, Indonesia, which states that maternal mortality is in West Sumatra occurs in mothers who give birth at age < 20 years [3]. This study's results following research said that age less than 20 years has 1.6 times the risk of causing maternal death [4]. This study's results follow the researchin Bondowoso District, East Java, which states that maternal age is not an indirect maternal mortality indicator. According to the results of this study, the indirect indicator of maternal mortality is the completeness of antenatal visits, pregnancy risk factors, maternal education, and maternal employment status [5]. The research results in Korea also mention

that too young mothers are not a determinant of maternal mortality. This study in Korea states that the determinants of maternal mortality within six weeks or one year after childbirth are maternal age between 35-39 years, living in rural areas, giving birth by cesarean section, and having comorbidities [6].

Table 2. Analysis of 4T maternal mortality by age too old (< 35 years)

Mother 4T Too old	Died	Not Died	Total	RR (95% CI)
Yes	8 (33.3)	107,163 (53.1)	107,171 (53.0)	0.443
No	16 (66,7)	94,844 (46.9)	94,860 (47.0)	
Total	24 (100.0)	202,007 (100.0)	202.031 (100.0)	

Based on the analysis of maternal mortality with 4T based on age too old (< 35 years), there were 8 Pus 4T mothers or 33.33% who died because they were old or more than 35 years old. The statistical analysis results obtained a Risk Ratio (RR) of 0.443, which means that the RR value < 1which means it has a protective effect against disease. The protective effect here is that mothers with 4T who are too old (> 35 years) will have the opportunity to cause maternal death (Table 2).

Women whose first pregnancy is ≥ 35 years of age also have a high risk of experiencing maternal death during pregnancy, childbirth, and postpartum. In this age range, the disease in the mother is manageable, and the womb organs age. The birth canal also gets stiffer. There is a greater chance of obstructed labor and bleeding. Being too old can cause complications in pregnancy, childbirth, and the puerperium. According to researchin, Finland states that being pregnant at an old age will cause most eclampsia, indirectly leading to maternal death [7]. Based on research in West Sumatera Province, Indonesia, maternal mortality is likely considerable in mothers who give birth at more than 35 years[3]. A study in Sukoharjo District, Central Java Province, Indonesia, shows that those over 34 years of age have 1.6 times the risk of causing maternal death [4]. Research in Korea also mentioned that mothers aged 35-39 years, living in rural areas, giving birth by cesarean section, and having comorbidities in the mother are determinants of maternal mortality within six weeks or one year after delivery [6]. Another study that analyzed data from 144 countries also stated that the highest risk of maternal death was in women aged> 30 years [8].

Table 3.Analysis of maternal mortality with 4T based on too many children (> 4 people)

Mothers with 4T Too Many Children	Died	Not Died	Total	RR (95% CI)
Yes	3 (12.5)	4,295 (4.3)	4,298 (4.3)	3,153
No	21 (87.5)	94,839 (95.7)	94,860 (95.7)	
Total	24 (100.0)	99,134 (100.0)	99,158 (100.0)	

Based on the analysis of maternal mortality with 4T based on the number of children too many or more than 4 children, three mothers with 4T mothers or 12.5% died because there were too many children or more than 4 children. The analysis results obtained a Risk Ratio (RR) of 3.153, which means that the value of RR> 1which means it has a very significant relationship. The point is that mothers with 4T who have children more than 4 children have a risk of dying three times than mothers with 4T who have children less than 4 children (Table 3).

Too many children are likely to interfere with the health of mothers who are pregnant or after delivery. Too often, giving birth can harm a mother, so that the risk of death increases. If you give birth too often, there may be bleeding during delivery. Bleeding occurs due to failure to contract the uterus or what is commonly called postpartum bleeding. The increasing number of children who are not limited is expected to increase complications [9]. Research in West Sumatra Province, Indonesia, shows that the proportion of maternal deaths due to bleeding occurs more in mothers with parity > 3 children than mothers with parity < 3 children[3]. This study's results are also following the results of a longitudinal study in Israel, which states that mothers with children 5-9 and > 10 people have a higher mortality rate than mothers with 2-4 children [10].

Table 4. Analysis of maternal mortality with 4T based on the birth distance of children too close (< 2 years)

Mother with 4T Too Close	Died	Not Died	Total	RR (95% CI)
Yes	1 (4,2)	3,930 (3.98)	3,931 (4.0)	1.05
No	23 (95.8)	94,837 (96.0)	94,860 (96.0)	
Total	24 (100.0)	98,767 (100.0)	98,791 (100.0)	

Based on maternal mortality with 4T, based on the number of children who are too close to less than four years, there is one mother or 4.17%. (< 20 years). The majority of 4T mothers who died had children more than two years apart between this pregnancy and their previous child. The analysis results obtained a Risk Ratio (RR) of 1.049, which means that the value of RR> 1which means it has a very significant relationship. The point is that mothers with 4T who has a distance of children who are too close or less than 2 years have a risk of dying 1 time than mothers with 4T who span more than two years (Table 4).

The birth spacing between one child and any other child less than two years of age may increase maternal death risk. At intervals of less than 24 months (too frequent), delivery is a high-risk group for postpartum hemorrhage, maternal morbidity, and mortality. The recommended distance between pregnancies is generally at least two years to allow the woman's body to recover from the extra demands of pregnancy and lactation. The pregnancy distance at risk or the distance between birth and the smallest child is less than two years because the mother's physical and uterus still needs enough rest, not to mention the mother's condition who is still breastfeeding. Besides, the distance between births that is> 10 years is as if facing the first labor again. This study's results are consistent with research in Sidoarjo Regency, East Java Province, Indonesia, which found that most birth spacings were less than two years causing physical health and the mother's uterus still needed enough rest and the mother was still breastfeeding [11].

This study's results are also consistent with research in the Special Region of Yogyakarta, Indonesia, which states that birth spacing < 2 years is significantly associated with preeclampsia incidence. This result means that the closer the birth distance between children,

the greater the risk of preeclampsia [12]. However, a literature review states that long birth spacing (> 5 years) also increases the incidence of preeclampsia [13]. The results of another study in Norway showed that having two to three children with an interval between single births of less than 18 months, and mothers of twins have an increased risk of death in middle age and early age compared with parents with a delivery interval of 30-41 months [14].

Table 5. Analysis of maternal mortality based on contraceptive use

Mother with 4T	Died	Not Died	Total	RR (95% CI)
Not using contraception	9 (75.0)	15,863 (13.6)	15,872 (13.5)	19.3
Using contraception	3 (25.0)	102,108 (86.4)	102,111 (86.5)	
Total	12 (100.0)	117,971 (100.0)	117,983 (100.0)	

Based on the RR (Risk Ratio) analysis, it gets a value of 19.3, which means that the value of RR> 1 has a very significant relationship. The point is that mothers with 4T who do not use contraception have a risk of dying 19.3 times than mothers with 4T who use contraception (Table 5).

Postpartum mothers and couples of childbearing age are the direct targets of the family planning program. They are expected to gradually become active participants in sustainable family planning to affect decreasing fertility directly. Active participation of couples of childbearing age and postpartum mothers using contraception is a form of responsibility and concern for their reproductive health and healthy and safe sexual behavior for themselves, their partners, and their families. Mothers with 4T are significantly at risk of experiencing complications or complications during pregnancy, childbirth, and postpartum, so they need to use postpartum contraception to spacing, delay, or terminate the pregnancy. This study's results are consistent with research in Cilacap Regency, Central Java Province, that mothers who have never used contraception have a 33.1 times greater risk of experiencing maternal death than mothers who take family planning programs [15].

This study also follows the research in Tajikistan, which found that women using modern contraceptives were half as likely to limit births if they already had three or fewer children than women using traditional contraceptive methods or women who did not use contraception [16]. The analysis of 146 Demographic and Health Surveys from 1990-2005 shows that the indirect effect of using contraception can reduce a country's maternal mortality rate by an estimated 450 points during the transition from low to high-grade contraceptive use. The increasing use of modern contraceptives will continue to reduce maternal mortality in developing countries [17].

Conclusion and Acknowledgment

The incidence of maternal death is caused by proxy determinants or disease factors suffered by the mother during pregnancy, childbirth, and the puerperium. 4T maternal status is also a risk factor for maternal mortality. The mother's status 4T can also be caused by the mother's non-compliance in using contraception to regulate or delay the desire to have children, especially mothers with 4T status. For this reason, health workers need to be alert to pregnancy complications. And it is necessary to collect data on PUS 4T to make it easier to monitor and provide counseling related to threats to 4T mothers' health status if they are pregnant, in labor, and after delivery.

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References

1. National Population and Family Planning Agency. Regulation of the Head of the National Population and Family Planning Agency Number 24 of 2017 concerning Postpartum and Post-Miscarriage Family Planning Services [Internet]. Indonesia; 2017 p. 64. Available from: https://jdih.bkkbn.go.id/public_assets/file/b46495c55893d8086a6fa2b5c2929af9.pdf
2. McCarthy J, Maine D.A Framework for Analyzing the Determinants of Maternal Mortality. Stud Fam Plann. 1992; 23 (1): 23.
3. Mariati U, Agus Z, Sulin D, Masrul, Amri Z, Arazy F, et al. Study of Maternal Mortality and Infant Mortality in West Sumatra Province: Problem and Determinant Factor. J Kesehat Masy Nas [Internet]. 2011; 5 (6): 243–9. Available from: http://journal.fkm.ui.ac.id/kesmas/article/view/119
4. Respati SH, Sulistyowati S, Nababan R. Analysis of Determinant Factors of Maternal Mortality in Sukoharjo Regency, Central Java, Indonesia. J Reproductive Health. 2019; 6 (2): 52–9.
5. Fransiska RD, Respati SH, Mudigdo A. Analysis of Maternal Mortality Determinants in Bondowoso District, East Java. J Matern Child Heal. 2017; 02 (01): 76–88.
6. Jeong W, Jang SI, Park EC, Nam JY. The effect of socioeconomic status on all-cause maternal mortality: A nationwide population-based cohort study. Int J Environ Res Public Health. 2020; 17 (12): 1–13.
7. Lamminpää R, Vehviläinen-julkunen K, Gissler M, Heinonen S.Preeclampsia complicated by advanced maternal age: a registry-based study on primiparous women in Finland 1997–2008. BMC Pregnancy Childbirth. 2012; 12 (47): 1–5.
8. Nove A, Matthews Z, Neal S, Camacho AV. Maternal mortality in adolescents compared with women of other ages: Evidence from 144 countries. Lancet Glob Heal. 2014; 2 (3): e155–64.
9. Yasril AI, Mahampang M. Pathway Analysis of Factors for Maternal Mortality Rate in East Java Province in 2014. J Biometrics and Kependud. 2019; 7 (2): 149.
10. Dior UP, Hochner H, Friedlander Y, Margalit RC-, Jaffe D, Burger A, et al. Association between the number of children and mortality of mothers: results of a 37-year follow-up study. Ann Epidemiol [Internet]. 2013; 23 (1): 13–8. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3624763/pdf/nihms412728.pdfhttps://www.ncbi.nlm.nih.gov/pmc/articles/PMC3520435/pdf/nihms423512 .pdf
11. Wandira AK, Indawati R. Factors that cause infant mortality in Sidoarjo Regency. J Biometrics and Kependud. 2012; 1 (1): 33–42.
12. Kartikadewi R, Theresia EM, Meilani N. Age, parity, and birth spacing to preeclampsia incidence. Int J Public Heal Sci. 2019; 8 (1): 45–50.
13. Conde-agudelo A, Rosas-bermúdez A, Kafury-goeta AC. Effects of birth spacing on maternal health: a systematic review National Center for Biotechnology Information. Am J Obs Gynecol. 2007; 196 (4): 297–308.
14. Grundy E, Kravdal Ø. Do short birth intervals have long-term implications for parental health? Results from analyzes of complete cohort Norwegian register data. J Epidemiol Community Heal. 2014; (68): 958–64.
15. Fibriana AI. Risk Factors Affecting Maternal Death [Internet]. Diponegoro University; 2007. Available from:https://core.ac.uk/download/pdf/11716476.pdf
16. Merali S. The relationship between contraceptive use and maternal and infant health outcomes in Tajikistan. Contraception. 2016; 93 (3): 216–21.
17. Stover J, Ross J. How increased contraceptive use has reduced maternal mortality. Matern Child Heal J. 2010; 14 (5): 687–95.