



Factors Associated with Prolonged Parturition

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Abstract: In Indonesia, the mortality rate for mothers and babies is increasing; one of the causes is prolonged labor. This study aimed to determine the factors associated with prolonged labor events. This type of research is an analytical survey with a cross-sectional research design. The study population was all mothers giving birth to as many as 252 people, with a sample of 72 randomly taken. The research instrument uses a checklist sheet. The data used is secondary data obtained from medical records and documentation. Data analysis was carried out using a test that *squares*. The results showed that based on the age factor with prolonged labor, p -value = 0.018, parity factor with a long struggle, p = 0.001, and the birth weight factor for babies with a long work, p -value = 0.005. Based on this statement, it was obtained that the value of $p < \alpha$ where α = 0.05 means that there is a significant relationship between age, parity, and birth weight of the baby to long labor. Based on the study's results, it was concluded that the baby's age, equality, and birth weight are related to the incidence of prolonged labor.

Keywords: Baby; Health; Parturition; Woman

Introduction

MMR (Maternal Mortality Rate) and IMR (Infant Mortality Rate) are important indicators in determining the degree of public health. One of the main priorities in the development of the health sector, as stated in the Proenas and the Strategy for MMRng Pregnancy Safer (MPS) or Safe Pregnancy, is a continuation of the Safe Motherhood Program to accelerate the reduction of maternal and newborn morbidity and mortality (Gwijangge, 2021; KemenKes R I, 2012; Priskusanti et al., 2022). WHO (World Health Organization) explains that to achieve the Millennium Development Goal's target, the reduction in maternal mortality from 1990 to 2015 must reach 5.5 percent per year (Susilawati et al., 2022).

According to data from the 2003 Indonesian Demographic Health Survey (IDHS), the MMR in Indonesia was 307/100,000 live births. In 2007, 228/100,000 live births, and in 2009 226/100,000 live births. The 2003-2009 range for the decline in MMR in Indonesia was still far from the target of the MDG's Development Goals, namely reducing the maternal mortality rate by three quarters during pregnancy and childbirth. The target to be achieved in 2010 and 2015 is

an estimated 125/100,000 live births and 115/100,000 live births (KemenKes R I, 2012).

The maternal mortality rate in North Sumatra for the last four years has exceeded the MMR rate nationally. In 2007 it reached 231/100,000 live births; in 2008, it increased to 258/100,000 live births; in 2009, it became 260/100,000 live births; and in 2010, it reached 249/100,000 live births (Sarlina, 2012).

Maternal deaths by cause are divided into direct deaths and indirect deaths. Globally, 80% of maternal deaths are classified as direct causes of maternal death, namely bleeding (25%), sepsis (15%), pregnancy poisoning (12%), and complications of unsafe abortion (13%), prolonged labor (8%), and other causes. (7%)(Kustriyani et al., 2019; Oktaviani, 2019; Sumampouw et al., 2019; Tarigan et al., 2021).

Prolonged parturition is one of the causes of maternal and infant mortality. According to the WHO (World Health Organization), in 2007, statistics on prolonged labor caused maternal death by 8%, while in Indonesia, it was (9%). The leading causes of stillbirths are due to labor disorders (25%), prolonged labor (19%), complications of the mother's disease before delivery (13%), and malpresentation (12%). The cause of stillbirth

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due to prolonged labor is 26% in the world and 30% in Indonesia (Darma et al., 2020; Hadianti et al., 2018; KemenKes RI, 2012; Yuliasari et al., 2018).

Old parturition is caused by various factors, namely fetal factors and maternal factors. Factors that influence the duration of labor include maternal factors, fetal factors, and birth canal factors. Maternal factors include age, parity, premature rupture of membranes (PROM), and maternal psychology (Amelia, 2019; Cai et al., 2019; Hadianti et al., 2018; Markhamah et al., 2021; Sureshbabu et al., 2021). Fetal factors include attitude, position, malposition and malpresentation, large fetus, and congenital abnormalities such as hydrocephalus. Meanwhile, birth canal factors include a narrow pelvis, tumors in the pelvis, and abnormalities in the cervix and vagina.

The maternal factor is significant for each birth, namely age; if the mother is less than 20 years old, the younger the mother, the reproductive function has not developed correctly, so the possibility of complications in childbirth will be greater. Suppose the mother is more than 35 years old. In that case, she is also at risk because the older the mother is, the more progressive deterioration of the endometrium will occur, so to provide adequate nutrition for the fetus, broader placental growth is required. In contrast, the safe age of the mother is 20-35 years because the reproductive organs are mature.

Gesesew and Mesfin's research results at Adigrat Zonal Hospital in Ethiopia obtained 195 cases of prolonged labor. A total of 114 cases occurred in women aged 20-34 years with a proportion of 58.4%, as many as 60 cases occurred in women aged > 34 years with a proportion of 30.8%, and as many as 21 cases occurred in women aged <20 years with a proportion of 10.8%. Meanwhile, in parity, 90 cases occurred in parities 1-4 with a proportion of 46.2%, 59 cases in parity 0 with a proportion of 30.2%, and 46 cases in parity > 5 with a proportion of 23.6%.

Thessianne's research at Santa Elisabeth Hospital in 2005-2009 recorded 615 cases of labor with prolonged labor. The highest proportion was the age group of 25-30 years with 28.9%, parity 1-3 with 55.4%, abnormal fetal position with 36.0%, premature rupture of membranes with 67.3% with baby weight 2500-4000 grams 86.1% (Dipta, 2010).

This research is important because prolonged labor is still a problem in Indonesia, especially in rural areas. After all, many marriages still occur at an early age. The incidence of prolonged labor, according to research, is 2.8-4.9 percent. Prolonged labor still occurs frequently, and this situation causes morbidity rates and the Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR) to remain high. Efforts must be made to prevent such prolonged labor. Maternal factors are very

important for each birth, namely age; if the mother is less than 20 years old, the younger the mother is, the reproductive function has not yet developed perfectly, so the possibility of complications during childbirth will be greater. If the mother is more than 35 years old, she is also at risk. Because as the mother gets older, there will be a progressive decline in the endometrium, so more extensive placental growth is required to provide sufficient nutrition for the fetus. Meanwhile, the safe maternal age is 20-35 because the reproductive organs are mature (Ardhiyanti et al., 2016; A. Putri et al., 2019).

Based on the initial survey conducted by researchers in the Midwifery Room of Martha Friska Brayan Hospital, Medan, data were obtained on 252 mothers giving birth. Based on the background above, the authors are interested in researching factors related to prolonged parturition to know factors related to prolonged parturition.

Method

This type of research is an analytical survey research with a cross-sectional research design, namely, to determine the factors that influence prolonged parturition. This research was conducted at Martha Friska Hospital in Medan because prolonged labor cases were relatively high. The total population is 252, and it is carried out by systematic sampling technique (systematic random sampling) with a total sample of 72 people.

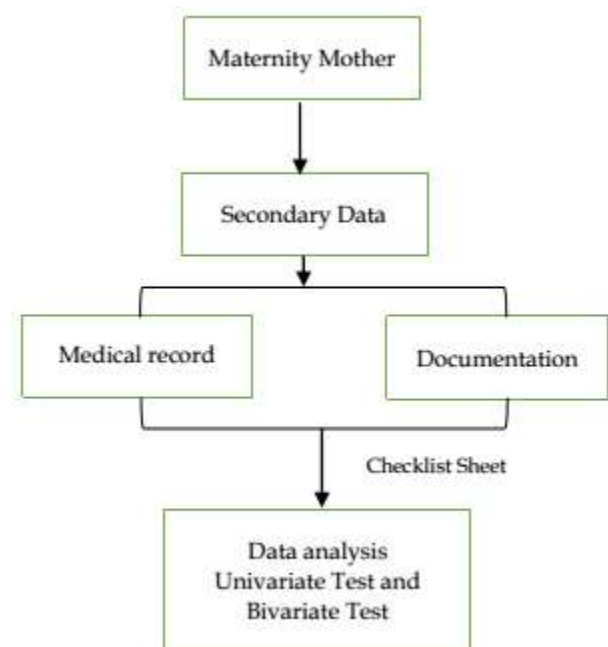


Figure 1. Research flow

The instrument used in this study was a checklist prepared by the researcher according to the study's

specific objectives. Data analysis used: Univariate analysis conducted an analysis of all the independent variables and dependent variables studied, namely the age of the mother, parity, and birth weight of the baby based on the frequency distribution table. Bivariate analysis to determine the relationship between the independent variables and the dependent variable is the relationship between age, maternal parity, and birth weight of the baby to the incidence of prolonged labor. Variables - The variables studied were tested using the Chi-square statistical test, level of significance ($\alpha= 0.05$). The chi-square test is used to see the relationship between each independent variable and the dependent variable. If the results of statistical calculations with the help of computer software (SPSS) value $P < 0.05$, then there is a significant relationship between one independent variable and the dependent variable.

Result and Discussion

Research Result

The results of research conducted on factors related to prolonged labor events, which are recorded in the medical record, can be seen in the following table:

Univariate Table

To find out the frequency distribution of those who experience prolonged labor in terms of the age of the mother, the mother's parity, and the baby's birth weight, can be seen in the following table:

Table 1. Frequency Distribution of Respondents based on Mother's Age

| Mother's age | Frequency | % |
|---------------------------|-----------|------|
| (20 years - 35 years) | 42 | 58.3 |
| (<20 years and >35 years) | 30 | 41.7 |
| Amount | 72 | 100 |

Based on the table 1, it can be seen that the majority of respondents aged 20 years - 35 years were 42 people

(58.3%), and the minority were aged <20 years and >35 years were 30 people (41.7%).

Table 2. Frequency Distribution of Respondents based on Mother's Parity

| Mother Parity | Frequency | % |
|---------------|-----------|------|
| Nullipara | 50 | 69.4 |
| Multipara | 22 | 30.6 |
| Amount | 72 | 100 |

Based on the table 2, it can be seen that the majority of respondents have Nullipara parity of 50 people (69.4%), and the minority with Multipara parity is 22 people (30.6%).

Table 3. Frequency Distribution of Respondents based on the Baby's Birth Weight

| Baby's Birth Weight | Frequency | % |
|-------------------------|-----------|------|
| 2500 grams - 4000 grams | 63 | 87.5 |
| >4000 grams | 9 | 12.5 |
| Amount | 72 | 100 |

Based on the table 3, it can be seen that the birth weight of the majority of respondents was 2500-4000 grams, with 63 people (87.5%), and minorities >4000 grams with 9 people (12.5%).

Table 4. Frequency Distribution of Mothers Experiencing Prolonged Parturition

| Old Partition | Frequency | % |
|---------------|-----------|------|
| Yes | 41 | 56.9 |
| No | 31 | 43.1 |
| Amount | 72 | 100 |

Based on the table 4, it can be seen that the number of mothers who experienced prolonged labor was 41 people (56.9%), and those who did not experience prolonged labor were 31 people (43.1%).

Table 5. Relationship between Maternal Age and Prolonged Parturition

| Mother's age | Old Partition Events | | | | Total | | X2 Count | P |
|-------------------------|----------------------|------|----|------|-------|-----|----------|-------|
| | Yes | | No | | F | % | | |
| | F | % | F | % | | | | |
| 20 years - 35 years | 19 | 45.2 | 23 | 54.8 | 42 | 100 | 5.63 | 0.018 |
| <20 years and >35 years | 22 | 73.3 | 8 | 26.7 | 30 | 100 | | |

Table 6. Relationship between Maternal Parity Factors and Prolonged Parturition

| Mother Parity | Old Partition Events | | | | Total | | X2 Count | P |
|---------------|----------------------|------|----|------|-------|-----|----------|-------|
| | Yes | | No | | F | % | | |
| | F | % | F | % | | | | |
| Nullipara | 35 | 70 | 15 | 30 | 50 | 100 | 11.37 | 0.001 |
| Multipara | 6 | 27.3 | 16 | 72.7 | 22 | 100 | | |

Based on the table 5, of the 42 mothers aged 20 – 35 years, the majority did not experience prolonged labor, as many as 23 (54.8%), and of the 30 mothers aged <20 years and > 35 years, the majority experienced prolonged labor as many as 22 people (73.3%). From the results of statistical data analysis using the chi-square test, there is a significant relationship between maternal age and prolonged labor, where the p-value (0.018) < α (0.05).

Based on the table 6, 50 nulliparous mothers experienced prolonged labor, as many as 35 (70%), and of the 22 multipara mothers, the majority did not experience prolonged labor, as many as 16 (72.7%). From the results of statistical data analysis using the chi-square test, there is a significant relationship between maternal parity and prolonged labor, where the p-value (0.001) < α (0.05).

Table 7. Relationship between Birth Weight Factors and Prolonged Parturition

| Birth Weight | Old Partition Events | | | | Total | | X2 Count | P |
|-----------------|----------------------|------|----|---|-------|-----|-------------|-------|
| | Yes | | No | | F | % | | |
| | F | % | F | % | F | % | | |
| 2500–4000 grams | 32 | 50.8 | 31 | | 63 | 100 | 7.77 | 0.005 |
| >4000 grams | 9 | 100 | 0 | 0 | 9 | 100 | | |

Based on the table above, of the 63 mothers with a birth weight of 2500–4000 grams, the majority experienced prolonged labor, 32 of them (50.8%), and of the nine mothers (100%) with a birth weight of >4000 grams having long labor. From the results of statistical data analysis using the chi-square test, there is a significant relationship between the birth weight factor and the incidence of prolonged labor, where the p-value (0.005) < α (0.05).

Discussion

Relationship between Mother's Age and Old Parturition

Based on the results of research conducted at Martha Friska Brayan Medan Hospital, it was shown that respondents who experienced prolonged labor in the age group <20 years and > 35 years were 22 people (53.65%), in the age group 20-35 years, namely 19 people (46.35%), Furthermore, respondents who did not experience prolonged labor in the age group 20 years - 35 years, namely as many as 23 people (74.19%); in the age group <20 years and > 35 years, namely as many as 8 people (25, 81%). From the results of the chi-square test, it is found that probability = 0.018 with α = 0.05, so $p < \alpha$ means that H_0 is rejected, meaning that there is a relationship between the maternal age factor and the incidence of prolonged labor at Martha Friska Hospital.

The results of this study indicated that 31.3 percent of the case group was at risk of having a long labor, while in the control group, 10.4 percent of the age group was at risk of having a long labor. The test results showed a significant relationship ($p < 0.05$) between maternal age and the incidence of prolonged labor. Maternal age is a risk factor related to the quality of pregnancy or related to the readiness of the mother for reproduction. In women who are less than 20 years old, the development of the reproductive organs is immature so that complications often arise during childbirth, while in women who are more than 35 years old, the body's

cells, especially the endometrium, begin to regress, causing the process of pregnancy and childbirth to be risky.

According to the researchers' assumption that the age factor is related to the incidence of prolonged labor. Age is one of the variables related to individual health. In the healthy reproductive age group, it is hoped that mothers will be able to solve problems emotionally calmly, especially in dealing with pregnancy, childbirth, and childbirth (Afulani et al., 2017; Kolker et al., 2021; Lewis et al., 2019; Puspitasari, 2018; Wulandari et al., 2021). This research is in line with research (Dipta, 2010), which stated that the incidence of prolonged parturition was 1.8 times greater in mothers aged <20 years and >35 years compared to mothers aged 20 years - 35 years.

This research is also in line with other studies conducted by Putri et al. (2020), Sjahriani et al. (2019) and Yuliasari et al. (2018) results obtained that mothers aged <20 years or >35 years have a 1.7 times greater risk of experiencing prolonged labor compared to mothers aged 20-35 years. The mother's age, who is too young or old, is considered vital. After all, it also determines the prognosis of childbirth because it can carry risks. In accordance with the results of research in Makassar conducted (Aprilla, 2018; Kurniati, 2021), Using a case-control study research design, it was found that mothers who experience prolonged labor are 1.4 times more likely to be <20 years old and > 35 years old than those aged 20 years - 35 years. According to Ayazbekov et al. (2020), de Lima et al. (2019), Frederiksen et al. (2018), Sun et al. (2020), and Wong et al. (2020) that pregnant women who are over 35 years old have a high risk of pregnancy and childbirth, where at that age changes occur in the tissues of the reproductive organs. The birth canal is not flexible, and the dangers that can occur in this group include prolonged labor due to force, including maternal labor and HIS abnormalities.

Age and experience are individual factors that are closely related to smooth delivery. Maternal age <20 years has a risk of experiencing prolonged labor. This is due to the incomplete development of the reproductive organs, so the condition of the uterus is still relatively small, and the formation of the pelvic bones is not wide enough. This statement is reinforced by Ariyanti's research (2012) where 143 people who gave birth at the age of mothers who were not at risk (20-35 years) mostly had standard deliveries, as many as 95 people (66.4%) and a small number had long deliveries as many as 48 people (33.6%).

According to Choudhury et al. (2021) and Stoffel et al. (2018), Increasing older maternal age can also at risk of complications due to decreased spontaneous labor. At the age of > 35, a woman's reproductive function has decreased compared to normal reproductive function, so the possibility of complications from childbirth, exceptionally long labor, will be greater.

Relationship of Maternal Parity with Old Patus Events

Based on the results of the study showed that respondents who experienced prolonged labor were in the Nullipara parity group, namely 35 people (85.36%); in the Multipara parity group, there were six people (14.64%), and respondents who did not experience prolonged labor in the group Nullipara parity, namely 15 people (48.38%), in the Multipara parity group, there were 16 people (51.62%). From the results of the chi-square test, it is found that probability = 0.001 with $\alpha = 0.05$, so $p < \alpha$ means that there is a relationship between maternal parity factors and prolonged parturition.

The results of this study can be seen that 35.4 percent with parity were at risk (> 3) of having a long labor, while in the control group, as much as 20.8 percent with parity were at risk of having a long labor. The statistical test results showed a significant relationship ($p < 0.05$) between parity and the incidence of prolonged labor. According to Eide et al. (2019), Ochieng et al. (2019), and Rodríguez-Almagro et al. (2019), mothers who often give birth have a risk of experiencing labor complications in subsequent pregnancies if they ignore nutritional needs. At a parity of more than three, the condition of the uterus is usually weak, causing prolonged labor and bleeding during pregnancy. This research is in line with research conducted by Mulyawati et al. (2011), which stated that out of 60 respondents, the majority of respondents with parity >4 experienced a cesarean section delivery, with a total of 39 respondents (65%). The test results showed a significant relationship ($p < 0.05$) between parity and cesarean section delivery. Parity is at risk of causing prolonged labor because the uterus muscles in women

who often give birth are weakened, which can result in a more prolonged labor process.

According to the researcher's assumption that there is a relationship between parity and prolonged labor, this statement is supported by the theory put forward by Lestari et al. (2018) and Saswita (2021), which states that women with high parity are at risk of experiencing prolonged labor because it is caused by the uterus having looseness in the uterine wall, laxity in the abdominal wall, the appearance of the mother with a hanging stomach. The dangers that can threaten this group are tears in the uterine wall, abnormalities (uterine atony), postpartum bleeding (after childbirth), prolonged labor, and abnormal location.

At low parity with age, less than 20 years, the risk of experiencing a long birth is very complex. In addition to the reproductive organs that are not ready, health problems often occur, for example (anemia, KEK mothers) resulting in power disturbances (the mother's labor), and there is a possibility of psychological disorders that are not ready for pregnancy (Sari, 2018; Windaryanti, 2022).

Research Ardhiyanti et al. (2016) found that there is a significant relationship ($p < 0.05$) between maternal age, parity, and the incidence of prolonged labor. Mothers aged <20 years or >35 years are more at risk of experiencing prolonged labor than mothers aged 20-35 years, mothers with parity >3 are more at risk of experiencing prolonged labor than mothers with parity <3, and mothers with weak hys at the time of delivery are more at risk of experiencing prolonged labor compared to mothers with strong hys during labor.

Research result Yuliasari et al. (2018), there is a relationship between maternal age and prolonged labor at Abdul Moeleok Hospital, Lampung Province, in 2013 (p -value 0.002; OR 2.027). This study's results align with the study's results (Lubis et al., 2021; Ruqaiyah et al., 2019; Wagura et al., 2018). The results show a relationship between parity factors and prolonged parturition. The results of this study are also in line with the results of the study (Fauzi et al., 2020; Handayani, 2022) using a case-control study research design found that mothers who experience prolonged labor are 1.3 times more likely to have parity 0 and > three compared to parity 1-3.

Relationship between Birth Weight and Prolonged Parturition

Based on the results of the research conducted, it was shown that 32 people (78.04%) had a baby with a birth weight of >4000 grams, nine people (21.96%) had a baby with a birth weight of >4000 %, and respondents who did not experience prolonged labor with a birth weight of 2500 grams - 4000 grams, namely 31 people (100%).

From the results of the chi-square test, it is found that probability = 0.005 with $\alpha = 0.05$, so $p < \alpha$ means that there is a relationship between the baby's birth weight and the incidence of prolonged labor. The analysis results of the relationship between birth weight and prolonged labor are that mothers with children with birth weights of more than 3500 grams risk 2.65 times for prolonged labor compared to mothers with babies with birth weights <3500 grams. This relationship is statistically significant with $p < 0.05$. This is in line with Rusmartini's research (2003) that mothers who gave birth to babies whose birth weight was > 3500 grams had a 2.17 times risk of prolonged labor compared to mothers who gave birth to babies with a weight of 5 times the birth weight was better (OR 4.61).

The results of this study are following (Andriani, 2020; Prihartini et al., 2023; Shariff, 2019; Sigalingging et al., 2018; Sveinsdottir et al., 2019; Wati, 2022), the greater the weight of the baby born increases the risk of difficulties in the delivery process, especially in the second stage. Long labor often occurs because the perineum is not strong enough to hold the stretch of the baby's head with a large baby's weight in the process of giving birth to a baby with a significant birth weight.

Research result Ruqaiyah (2019) shows that there is a relationship between birth weight and the incidence of prolonged parturition at RSAL Jala Ammari Makassar with a value of $P(0.000) > \alpha(0.05)$, smaller than $\alpha = 0.05$. According to the researchers' assumptions that large babies are a factor in prolonged labor which is closely related to malpositions and malpresentation, malpositioned fetuses are most likely to cause prolonged labor or obstructed labor.

Conclusion

There is a relationship between the age factor and the incidence of prolonged labor with a real level ($\alpha=0.05$), obtaining a probability of 0.018. There is a relationship between the parity factor and the incidence of prolonged labor with a real level ($\alpha=0.05$), obtaining a probability of 0.001. There is a relationship between the baby's birth weight and the incidence of prolonged labor with a real level ($\alpha=0.05$), with a probability of 0.005.

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Author Contributions

The main Maida Pardosi designing research, conducting research, collecting data, and writing research articles, conducted data analysis.

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Conflicts of Interest

The author declares that all authors have no conflict of interest. Thank You.

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