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Overview of Delivery Complications Using IKAlin Instruments in Bandar Lampung

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ABSTRACT

The maternal mortality rate (MMR) in Lampung Province in 2020 has increased compared to 2019, namely from 110 cases to 115 cases. Bandar Lampung City is one of the regions in Lampung Province with the third highest MMR, 10 cases (8.69%). This research aims to determine the description of childbirth complications experienced by post-partum mothers using the IKAlin instrument (Labour Complications Instrument) in Bandar Lampung in 2023. This type of research uses a descriptive survey method with random sampling. A sample of 222 post-partum mothers with labor complications. This research method involves interviews with post-partum mothers using the IKAlin instrument. The average results of mothers' answers show that the complication of pre-eclampsia that is felt is high blood pressure, the bleeding complication that is most often felt during labor is experiencing heavy bleeding, and the complication of dystocia that is most often felt is undergoing a prolonged second stage. The advice given is to encourage education about early detection in the community so that people, especially pregnant women, are aware of the importance of monthly pregnancy checks at health facilities to detect birth complications as early as possible.

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INTRODUCTION

Maternal Mortality Rate is the number of maternal deaths resulting from pregnancy, childbirth, and post-partum processes per 100,000 live births in a certain period. The Maternal Mortality Rate helps describe the level of awareness of healthy living behavior, maternal nutritional and health status, environmental health conditions, the level of health services, especially for pregnant women, the time of birth, and the post-partum period (Tanuwijaya & Susanto, 2022).

The maternal mortality rate (MMR) in Indonesia is also still considered very high, reaching 170 deaths per 100,000 live births. This figure places Indonesia as the country with the third highest maternal mortality rate after Myanmar and Laos in 2017. This figure is still far from the goal of the third SDG, namely 70 deaths per 100,000 live births (Nur & Shahnyb, 2022).

The Maternal Mortality Rate (MMR) in Lampung Province in 2020 shows that the number of cases of maternal death has increased compared to 2019, namely from 110 cases to 115 cases. The causes of maternal deaths in Lampung Province in 2020 were 44 cases of bleeding, 24 cases of hypertension, 2 cases of infection, 9 cases of circulatory system disorders, 1 case of metabolic disorders, and 35 cases of others (Health Office Lampung Province, 2021).

McCarthy and Maine in Firmansyah et al. (2022) stated that 3 factors influence the incidence of maternal death, namely, proxy determinants, intermediate determinants, and contextual determinants. Proxy determinants relate to pregnancy and complications that occur during pregnancy, antepartum, and post-partum (such as bleeding, pre-eclampsia or eclampsia, infection, prolonged labor, and uterine rupture). Intermediate determinants are determining factors directly related to proxy determinants. These determinants include maternal health status, reproductive status, access to health services, health care behavior, and use of health services, as well as other unknown or unexpected factors.

Assessing the validity of maternal reporting of delivery complications is critical. Especially in

Lampung, where many people live in rural areas, there is not much information about the danger signs of birth complications. This can make information about mothers' experiences inaccurate (Elmeida, 2021).

The long-term goal of using the IKAlin instrument is to determine the accuracy of the mother's answers so that it can provide results that are by the actual situation of complications and can have implications for determining early delivery complications, especially in this case, pre-eclampsia/ eclampsia, bleeding, and dystocia in pregnant women in Bandar Lampung.

METHOD

This type of research uses a descriptive survey method with random sampling. The research was carried out for 3 months from June to August 2023 at 10 inpatient health centers in the Bandar Lampung City Health Office working area, namely Kedaton, Simpur, Kampung Sawah, Kemiling, Sukabumi, Way Laga, Panjang, Sukaraja, Sukamaju, and Karang City Health Centers. The population in this study were post-partum mothers who experienced birth complications recorded at the health center. The total sample for this study was 222 post-partum mothers who experienced delivery complications and were domiciled in Bandar Lampung City.

This research method involves interviews with post-partum mothers using the IKAlin instrument. The interviewers were 10 enumerators recruited from alums of the D3 and D4 Midwifery Study Program at the Ministry of Health's Tanjungkarang Health Polytechnic who had been given equal answer training on how to fill out questionnaires before the start of the research.

The Ikalin instrument is an instrument created by Dr. Ika Fitiria Elmeida. M. Keb is a midwifery lecturer at the Tanjungkarang Health Polytechnic Midwifery Department. The IKAlin instrument is an instrument that contains a list of questions regarding complications of maternal delivery in hospitals and in the community, which has been tested for sensitivity, useful for surveys, and early identification of symptoms of complications in pregnancy and childbirth.

The IKAlin instrument contains seven questions for pre-eclampsia and eclampsia complications, five for bleeding complications, and six for dystocia complications. The IKAlin instrument contains closed questions with yes-and-no answer options. The question is:

Pre-eclampsia complications:

1. Shortly before giving birth or during delivery, did the mother feel pain in the pit of the stomach?
2. During pregnancy or just before giving birth, do you have headaches?
3. During pregnancy or just before giving birth, does the mother feel that her vision is blurry?
4. Have you ever suffered from seizures (other than epilepsy) during pregnancy?
5. Has the mother ever suffered from seizures (other than epilepsy) during labor?
6. Is the mother's blood pressure high during pregnancy or before giving birth? (≥140 mmHg)
7. What are the results of the lab examination? Your urine shows that there is a protein in your urine.

Bleeding complications:

1. Do you feel like you are bleeding a lot?
2. Does the mother experience bleeding that is amazing?
3. Does the mother seem to have many blood clots after giving birth?
4. Does the midwife or health worker look panicked and say that the mother is bleeding?
5. Does the mother experience bleeding that continues to flow?

Dystocia compilations:

1. Is the mother's labor time more than 24 hours?
2. Is the mother's labor time more than a day or a night?
3. Does the mother feel that the baby's position is "breech"?
4. Did the mother's labor take a long time with "no opening" so that the health worker said she had to have a cesarean section?
5. Is the mother's heartburn lasting more than one day and one night, and the baby "not pushing (no invitation or encouragement to push)?"
6. Did the mother's labor last so long that the health worker said that the labor process was assisted by a vacuum, "suction," or "forceps"?

The Ethics Committee Poltekkes Kemenkes Tanjung Karang has certified that this study is ethically feasible, as shown by certificate No.271/KEPK-TJK/IV/2023.

RESULTS

Based on Table 1, it can be seen that the majority of respondents were aged ≥20–35 years,

as much as 74%, and aged < 20 and > 35 years, as much as 26%. Almost all respondents are housewives (87% and only 13% work. Respondents who gave birth spontaneously or had a cesarean section were both 50%. Meanwhile, based on birth complications, 36% of respondents had pre-eclampsia complications, 27.5% had bleeding complications, and 36.5% had dystocia complications. Based on place of delivery, most of the respondents gave birth at PKM/RS (83%), and the remainder gave birth at PMB (17%). More than half of respondents based on birth assistance were assisted by doctors (68%) and midwives (32%). Respondents with >2 children were 91%, and ≤ 2 children were 9%. Based on birth interval, most respondents with a birth interval of ≥ 2 years were 91%, and <2 years were 9%. More than half of the respondents have health insurance, 71% do not, and 29% do not have health insurance.

Table 1. Respondent characteristics

Respondent Characteristics	n	%
Mother's Age		
≥20 -35	165	74
<20 dan >35	57	26
Mother's Occupation		
Work	191	87
Does not work	29	13
Type of birth		
Spontaneous	111	50
SC	111	50
Childbirth Complications Pre-Eclampsia	80	36
Bleeding	61	27,5
Dystocia	81	36,5
Place of Delivery		
RS/PKM	185	83
PMB	37	17
Childbirth Assistant		
Doctor	151	68
Midwife	71	32
Number of children		
≤ 2	86	40
> 2	134	60
Birth Distance		
≥ 2 year	202	91
< 2 year	20	9
Health Insurance		
Have	157	71
Do not have	65	29

Table 2 shows that mothers' answers to questions about birth complications with pre-eclampsia mainly were found in question 6 at 29.84% (77 answers), followed by answers to question 2 at 27.91% (72 answers). Then question 7 is in third place at 20.93% (54 answers), and Mother's 4th answer is in question 3 at 11.62% (30 answers).

Table 2. Frequency distribution of mothers' answers to questions about complications of childbirth with pre-eclampsia

Question	n	%
Shortly before giving birth or during delivery, did the mother feel pain in the pit of the stomach?	22	8.53
During pregnancy or just before giving birth, do you have headaches?	72	27.91
During pregnancy or just before giving birth, does the mother feel that her vision is blurry?	30	11.62
Have you ever suffered from seizures (other than epilepsy) during pregnancy	1	0.39
Has the mother ever suffered from seizures (other than epilepsy) during labor?	2	0.78
Is the mother's blood pressure high during pregnancy or before giving birth? (≥140 mmHg)	77	29.84
What are the results of the lab examination? Does your urine show that there is protein in it?	54	20.93

The mother's answer shows that the average answer to question number seven is the highest compared to other questions about the complications of childbirth with pre-eclampsia.

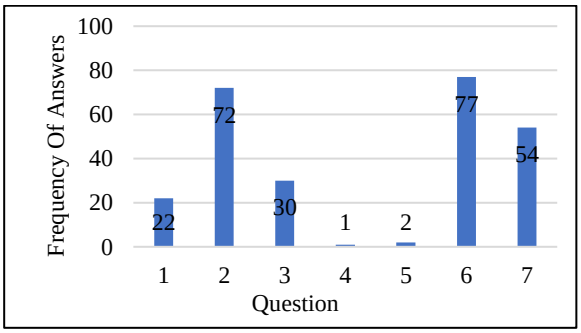

Figure 1. Mean response frequency of mothers' answers to questions about complications of childbirth with pre-eclampsia

Based on Table 3, it can be seen that mothers' answers to questions about birth complications with dystocia were mostly found in question number one at 24.88% (53 answers), followed by answers to question number five at 22.53% (48 answers), then question number three is in third place at 19.72% (42 answers), mother's 4th answer is in question number four at 19.25% (41 answers), and question number two is in last place at 13.62% (29 answers).

Table 3. Frequency distribution of mothers' answers to questions about complications of childbirth with bleeding

Question	n	%
Do you feel like you are bleeding a lot? (>500 ml)	53	24.88
Does the mother experience bleeding that is amazing?	29	13.62
Does the mother seem to have many blood clots after giving birth?	42	19.72
Does the midwife or health worker look panicked and say that the mother is bleeding?	41	19.25
Does the mother experience bleeding that continues to flow?	48	22.53

The mother's answer shows that the average answer to question number one is the highest compared to other questions about childbirth complications with bleeding.

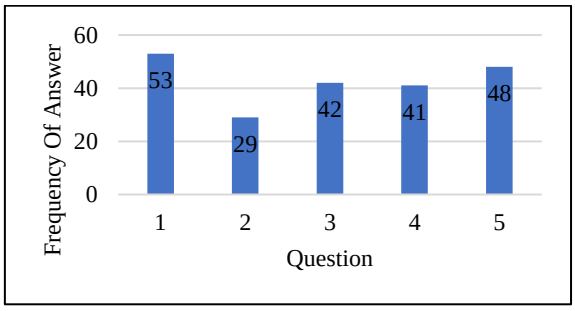

Figure 2. Mean response frequency of mothers' answers to questions about complications of childbirth with bleeding

Table 4 shows that mothers' answers to questions about birth complications with dystocia were mainly found in question number three at 24.29% (60 answers), followed by answers to question one at 21.86% (54 answers). The 5th question is in third place at 21.05% (52 answers), the fourth mother's answer is in the 2nd question at 19.84% (49 answers), and the fifth mother's answer is in question number three at 11.34% (28 answers).

The mother's answer shows that the average answer to question number four is the highest compared to other questions about the complications of childbirth with dystocia.

Table 4. Frequency distribution of mothers' answers to questions about complications of childbirth with dystocia

Question	n	%
Is the mother's labor time more than 24 hours?	54	21.86
Is the mother's labor time more than a day or a night?	49	19.84
Does the mother feel that the baby's position is "breech"?	28	11.34
Did the mother's labor take a long time with "no opening" so that the health worker said she had to have a cesarean section? (the portio feels thick, and there are no contractions or false contractions)	60	24.29
Is the mother's heartburn lasting more than one day and one night, and the baby is "not pushing (no invitation or encouragement to push)?"	52	21.05
Did the mother's labor last so long that the health worker said that the labor process was assisted by a vacuum, "suction," or "forceps"?	4	1.62

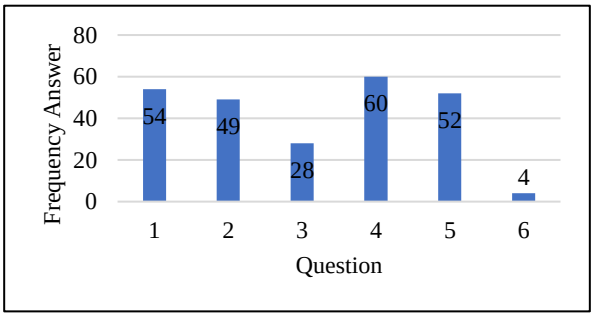

Figure 3. Mean response frequency of mothers' answers to questions about complications of childbirth with dystocia

DISCUSSION

The relationship between childbirth complications and pre-eclampsia

Based on Table 2 and Figure 1, it can be seen that the respondents' highest answer, indicating the perceived complication of childbirth with pre-eclampsia, was high blood pressure. This is in line with the research results of Muzalfah et al. (2018), which also showed a relationship between a history of hypertension and the incidence of pre-eclampsia (p-value=0.026). The proportion of mothers who had a history of hypertension in case respondents (51.4%) was higher than in control respondents (22.9%).

A history of hypertension in pregnant women is one of the predisposing factors for the severity of pre-eclampsia. Having a history of hypertension and also increasing organ workload during pregnancy can increase blood pressure, which, if not treated, can lead to mild or severe pre-eclampsia or even eclampsia. Pregnant women with pre-eclampsia tend to have worse health behaviors than pregnant women who do not understand pre-eclampsia, so pregnant women at risk of pre-eclampsia need to maintain healthy lifestyle habits (Saputri & Fransiska, 2023). All women with pre-eclampsia are at risk of rapid and severe disease progression regardless of the time of disease onset; 18% of HELLP syndrome and 55% of eclampsia occur at term (≥37 weeks) of gestation. A history of chronic hypertension and elevated systolic blood pressure or serum creatinine on hospital admission may be associated with an increased risk of developing severe disease in pre-eclampsia leading to preterm labor (34–36 (+6 days) weeks of gestation (Zwertbroek et al., 2017). Endothelial dysfunction can lead to reduced blood flow to organs such as the heart and kidneys, reduced venous blood drainage, and associated venous congestion. This contributes to organ dysfunction and can cause reflex narrowing of the arteries. Overall, it is hypothesized that endothelial dysfunction caused by placental shedding factors initiates and causes hypertension in pre-eclampsia (Gyselaers, 2022).

The second-most common felt complication of labor with pre-eclampsia was headache. This is consistent with American studies on women suffering from pre-eclampsia, which were based on autopsy data and a series of exams. Neurological problems account for 30-70% of fatalities, with intracerebral hemorrhage and cerebral fever being the most common causes. Unfortunately, the condition is neurological. Danger indicators in pregnant women, especially post-partum women, are frequently overlooked. Early detection, diagnosis, and treatment are expected to prevent at least half of maternal fatalities caused by pre-eclampsia. The international obstetric community increasingly acknowledges that neurological symptoms, such as headaches, can be associated with pre-eclampsia (Miller & Vollbracht, 2021). Headache is a common complaint leading to neurological consultation, and acute headaches in pregnant or post-partum women are threatening. Pregnancy and the post-partum period itself are considered danger signs, indicating a higher probability of diagnosing a secondary cause of headache. Whereas the majority of pregnant patients presenting for neurological consultation with acute headaches will have a primary headache disorder, more than a third will be found to have a secondary underlying cause for their headache, i.e., the majority of these are hypertensive disorders of pregnancy (Raffaelli et al., 2017). Pre-eclampsia and associated illnesses account for the majority of secondary headache problems in pregnancy. Pre-eclampsia headaches are typically progressive and bilateral, throbbing in nature, difficult to cure and interfere with physical activity. Patients may develop related visual abnormalities, such as blurred vision and scotoma, which might be misinterpreted for early migraine symptoms (Burch, 2019).

The third most common perceived complication of labor with pre-eclampsia is protein levels in the urine. According to Fillandro et al. (2019), all pre-eclampsia patients showed high protein levels in their urine (≥+1). This syndrome can indicate renal difficulties in pregnant women, as well as pre-eclampsia. Proteinuria occurs when more than 30 to 150 mg of protein is discharged in the urine each day; proteinuria can indicate early kidney disease and high blood fat levels (Kurniadi et al., 2017). The biochemical effects of urine protein on the development of pre-eclampsia might be transient (intermittent), orthostatic (occurring due to excessive sitting or standing activity), or permanent. If the underlying cause of intermittent proteinuria is addressed, the proteinuria will resolve. In orthostatic proteinuria, proteinuria excretion is normal while the patient lies down but increases when the patient sits or rises. This happens in 2% to 5% of young individuals, although it is widespread in those over the age of 30 (Djaga et al., 2020). Proteinuria during pregnancy might also result from urinary tract dilatation. This dilatation happens often throughout pregnancy, particularly in the fourth trimester. The right kidney is frequently dilated, which is common in nulliparas. Positive proteinuria detected by a urine dipstick in responders must be validated by additional investigation to verify whether the results are accurate. Amin SV et al. and Brown MA et al. found that the creatinine ratio was more accurate than dipstick urine in diagnosing proteinuria in pregnant women with hypertension throughout pregnancy (Kurniadi et al., 2017).

The fourth-highest answer by respondents regarding perceived complications of childbirth with pre-eclampsia was blurred vision. The complications of pre-eclampsia extend to involve many systems and organs; the eyes and vision system also experience problems. Induced visual symptoms occur in 25% of patients with severe

pre-eclampsia and 50% of patients with eclampsia. Pre-eclampsia causes various eye disorders. Blurred vision is the most common visual complaint. Focal or generalized narrowing of the arterioles is the most common eye narrowing found in pre-eclampsia or eclampsia syndrome. Other eye disorders include photopsia, visual field defects, a sudden inability to focus, and, in severe cases, complete blindness. Although visual impairment is quite common, complete blindness is rare, with an incidence of 1–3%. Blindness in pre-eclampsia/eclampsia syndrome can occur due to disorders of the occipital cortex, retina, or optic nerve. Most cases of blindness occur in pre-eclampsia and eclampsia, generally caused by retinal abnormalities, including blood vessel abnormalities, edema or ablation, and acute ischemic optic neuropathy due to decreased blood supply to the prelaminar part of the optic nerve. Currently, more treatment is given for cortical blindness (Abu Samra, 2013; Ives et al., 2020).

The highest answer from the five respondents indicated that the complication of childbirth with pre-eclampsia that they felt was heartburn. Little attention is paid to symptoms in the diagnosis of pre-eclampsia, although "epigastric pain" is frequently mentioned, there is no accurate description in the literature of the specific diagnostic features that differentiate upper abdominal pain due to pre-eclampsia from other causes. These symptoms are defined as "preeclamptic angina" (PEA). This is closely related to severe pre-eclampsia but is often not realized, especially if the usual symptoms of pre-eclampsia do not accompany it, and is usually experienced as severe pain that begins at night, maximum in the lower retrosternum or epigastrium, constant and unrelenting for 1-6 hours. It may be diffuse or limited to the right hypochondrium or back. The liver is painful on palpation of the abdomen. Pain may precede the diagnosis of pre-eclampsia by seven days or more and may be the only abnormality present, so there is no understanding of the presence of pre-eclampsia. The prognosis is poor and associated with high rates of maternal and fetal complications. Laboratory and clinical results of pre-eclampsia are eventually seen in all cases, but the absence of stomach ulcer symptoms may lead to an incorrect alternative diagnosis. Recognition of these typical symptoms will lead to early diagnosis of pre-eclampsia in atypical cases, thereby potentially avoiding maternal and perinatal morbidity and mortality (Karumanchi, 2016).

The lowest response from respondents indicated that the perceived complications of childbirth with pre-eclampsia were seizures during pregnancy and delivery. Pre-eclampsia, by definition, is an early symptom of eclampsia, so hypertension and proteinuria are prerequisites for seizures during pregnancy. Eclampsia remains a life-threatening complication of pregnancy, but there are no tests or symptoms that can reliably predict the development of seizures. The prevention of eclamptic seizures in women with pre-eclampsia is clear and justified. The first seizures that occur during pregnancy and disappear within minutes can usually be treated without anticonvulsant medication. MgSO4 therapy is more effective than anticonvulsant drugs, including phenytoin, and is now considered the treatment of choice for preventing eclampsia in preeclamptic women. Therapy can be initiated with an initial dose of 4 to 6g of MgSO4, followed by 2g/hour infusion. An additional dose of 2g may be given if seizures recur (Cipolla & Kraig, 2011).

The relationship between childbirth complications and bleeding

Based on Table 3 and Figure 2, it can be seen that the respondents' highest answer indicated that the Complications of Childbirth with Bleeding that they felt were experiencing a lot of bleeding complications accompanied by bleeding that continued to flow, producing lots of blood clots, causing health workers to panic and immediately take action because of the sudden bleeding. Apart from that, some mothers also experience bleeding after giving birth. The WHO defines post-partum bleeding as blood loss of >500ml in the 24 hours after giving birth. Several other definitions state that >500ml is the blood lost through normal delivery, while >1000ml is lost in a cesarean section. Forty percent of deaths due to post-partum hemorrhage occur in the first 24 hours, and 66% occur during the first week. Post-partum bleeding is caused by 4Ts, namely the tonus (uterine atony accounts for 70% of PPH cases), tissue (placental retention and blood clots), trauma (birth canal tears), and thrombosis (blood clotting disorders) (Vastra et al., 2023).

Uterine atony can be anticipated after prolonged labor, especially with the use of oxytocin, in pregnancies complicated by chorioamnionitis, high parity, general anesthesia, and other factors that cause excessive uterine distension, such as multiple fetal pregnancies, polyhydramnios, and fetal macrosomia. Trauma occurs in 15–20% of cases and is mainly caused by perineal or cervical laceration, perineal

hematoma, episiotomy, or uterine rupture. This happens in uncontrolled labor or vaginal birth with surgery. Retained conception results can increase the risk of post-partum hemorrhage by 3.5 times. Risk factors include a succenturized placenta and previous instrumentation. Coagulation problems can be divided into genetic, such as von Willebrand's disease, hemophilia, and idiopathic thrombocytopenic purpura, and acquired, such as the use of anticoagulant therapy and the occurrence of disseminated intravascular coagulopathy after a placental abruption, severe pre-eclampsia, intrauterine fetal death, sepsis, or amniotic fluid embolism. Other aetiologies include uterine inversion and abnormal placentation (Escobar et al., 2022).

An essential cornerstone in managing post-partum hemorrhage is prompt diagnosis and rapid replacement of lost blood volume, as well as the blood's capacity to carry oxygen, accompanied by immediate medical and surgical measures to address the underlying cause and prevent further blood loss. The Shock Index (SI) has been introduced as a simple and clinically effective vital sign to assess the patient's condition. SI has been shown to have an inverse linear relationship with left ventricular stroke action in acute circulatory failure. SI is calculated by dividing heart rate by systolic blood pressure. SI is used to increase the predictive ability of clinical signs in pregnant women for the early prevention of women who are at risk of experiencing hypovolemia, which causes bleeding. SI was first used in 1967 to identify hypovolemic shock in patients following acute gastrointestinal bleeding. (Borovac-Pinheiro et al., 2019) (Escobar et al., 2022). SI, together with the rule of 30, is an essential tool that can help physicians in emergencies determine the amount of blood loss and the degree of hemodynamic instability. Before systolic blood pressure falls, the heart rate increases to compensate for blood loss, so SI increases. The rule of 30 is an estimated blood loss of 30% of normal (70 ml/kg in adults, 100 ml/kg during pregnancy), which is characterized by a 30% decrease in hematocrit, a 30% decrease in hemoglobin (approximately 3 g/dl), a decrease in systolic blood pressure by 30 mm Hg, and an increase in heart rate by 30 beats per minute (Escobar et al., 2022).

Proper history-taking and medical documentation skills can uncover shock-related symptoms such as pain and blood loss, as well as general malaise, anxiety, and dyspnea. In particular, in developing countries with limited health services for treating PPH and in cases of home birth, diagnosis, treatment, or referral must be carried out earlier than in hospitals to prevent maternal death. Therefore, SI may be a standard that can be used in developing countries with the highest maternal mortality rates and is often associated with delays in recognition of complications, transportation/referral, and service levels in health facilities, especially at the primary level (Borovac-Pinheiro et al., 2019) (Escobar et al., 2022).

The relationship between childbirth complications and dystocia

Based on Table 4 and Figure 3, it can be seen that the respondents' highest answer indicated childbirth complications by indicating that the complication of dystocia that was most felt during labor was experiencing long second-stage complications that required cesarean surgery, labor lasting more than 24 hours, and feeling heartburn for more than one day. one night without opening, prolonged labor a day, and a night causing labor dystocia. Apart from that, some mothers also experience breech births and births using vacuum or porcelain. Labor dystocia (LD), which occurs during the active phase of the first stage, is most often diagnosed as a labor abnormality. It is defined as abnormally slow or prolonged labor, the absence of progressive cervical dilatation, or the absence of descent of the fetal head. This causes complications for the mother and fetus, such as postnatal bleeding, infection, fetal distress, death, an increased cesarean section (CS), and unpleasant birth experiences (Cunningham et al., 2018).

Many specialists describe the start of the active phase as the period of increased opening in the 4-6 cm dilation phase, considered the active phase's first stage. However, for the last decade, it has been thought that the start of the active phase must be 6 cm, as defined by the American Association of Obstetrics and Gynaecology, although WHO defines the start of the active phase as an acceleration point of 5 cm. This is the method utilized in Indonesia for incorporating VT (vaginal toucher) findings in partograph documentation (Hanley et al., 2016).

Labor dystocia often occurs in the active phase; in this case, SC surgery is often performed to end labor. Even though SC surgery is easy to do and does not take much time, if it is not handled correctly, it will hurt the mother and fetus. Therefore, understanding the factors that cause labor dystocia, which occurs in the active phase, is necessary to improve natural birth and reduce the incidence of CS operations as well as the incidence of maternal and fetal deaths in the

perinatal period. Five risk factors, namely premature rupture of membranes, fetal abdominal circumference, prolonged latent phase, and the fetus's station/pointing and position in the early stages of the active phase, are risk factors for causing labor dystocia. Occurs in the active phase (ACOG, 2016).

Premature rupture of membranes before delivery is a common complication in the field of obstetrics. The incidence rate is around 2.7%–17.0%. This can cause premature birth, fetal distress, infection, dystocia, and even fatally threaten the health of the mother and fetus. Premature rupture of membranes is often considered a warning sign of dystocia, which mainly occurs in mothers giving birth without the descent of the fetal head. This is caused by the gap between the fetal and pelvic presentation, the relationship between the anterior and posterior amniotic fluids, and the uneven pressure on the anterior amniotic sac. Premature rupture of membranes causes the loss of amniotic fluid. The uterine wall is close to the carcass and is susceptible to uncoordinated uterine contractions or obstructed rotation of the fetal head, thereby increasing the possibility of dystocia (Liu et al., 2023).

Fetal weight is an essential factor that influences obstetricians in evaluating delivery success. Fetal abdominal circumference is the most influential parameter for evaluating fetal weight. The increase in fetal weight in the third trimester is mainly manifested by an increase in fetal abdominal circumference and not by changes in fetal head circumference or biparietal diameter, which is associated with the accumulation of abdominal fat and the continuous accumulation and storage of liver glycogen. The study's results showed that fetal abdominal circumference and estimated fetal body weight were accurate in predicting macrosomia. Fetal macrosomia is known to be a risk factor for intrapartum dystocia and other significant complications of labor in the mother and fetus (ACOG, 2016).

A prolonged latent period is an early indication of dystocia. However, because it happens early in labor, it is difficult to distinguish it from false abortion. As a result, it is neglected, and opportunities for early treatment to avoid dystocia and negative consequences for both mother and fetus are lost. A study of 10,677 women discovered that the longer the latent period, the higher the chance of CS surgery. Furthermore, the incidence of post-partum hemorrhage, chorioamnionitis, blood transfusions, and dystocia has increased. A protracted latent phase might result in uterine atony, cephalopelvic disproportion, and aberrant pelvic size (Liu et al., 2023).

Souka et al. reported that the anterior occipital station (pointing to the lowest part of the baby's head) was the most common position during labor, followed by the posterior occipital and transverse positions. This position can be changed to an anterior occipital position during labor. However, if stagnant, labor should be diagnosed as a persistent transverse or posterior occipital position. In the first stage of labor, it is associated with labor dystocia. An abnormal fetal position can affect the descent of the fetal head, causing the head to float high and resulting in labor dystocia. The position of the fetus is above the ischial spine during the active phase, thereby increasing the possibility of dystocia (Liu et al., 2023).

Apart from that, there are other risk factors for the occurrence of labor dystocia, namely, maternal height less than 160 cm, low income, labor induction, epidural analgesia, maternal anxiety, dehydration, and a lack of medical support during labor (Nahaee et al., 2020).

CONCLUSION

The highest mean answer for respondents who experienced birth complications with pre-eclampsia was high blood pressure; with bleeding, the respondent felt profuse bleeding; and with dystocia, the respondent felt a long second stage.

Suggestions for this research health workers, especially midwives, as the front line of maternal and child health, must constantly update their knowledge and skills, especially in treating birth complications, so midwives can make appropriate decisions and refer patients to primary referrals. There is a need to promote education about early detection in the community so that people, especially pregnant women, are aware of the importance of monthly pregnancy checks at health facilities so that birth complications can be prevented as early as possible. The participation of all levels of society so that if complications are found in their environment, they can immediately contact health workers so that the mother and fetus can receive immediate help. Continuing research on Determinants of Childbirth Complications experienced by women giving birth in Bandar Lampung

REFERENCES

Abu Samra, K. (2013). The eye and visual system in the pre-eclampsia/eclampsia syndrome: What to expect?. *Saudi Journal of Ophthalmology*, 27(1), 51–53. https://doi.org/10.1016/j.sjopt.2012.04.003

American College of Obstetricians and Gynecologists (ACOG). (2016). Fetal macrosomia. Practice Bulletin No. 173. *Obst Gynecol 128*:e195–e209.

Borovac-Pinheiro, A., Pacagnella, R. C., Cecatti, J. G., Miller, S., El Ayadi, A. M., Souza, J. P., Durocher, J., Blumenthal, P. D., & Winikoff, B. (2019). Post-partum Hemorrhage: New Insights for Definition and Diagnosis. *Obstetric Anesthesia Digest*, *39*(2), 67–67. https://doi.org/10.1097/01.aoa.0000557648.35006.16

Burch, R. (2019). Headache in Pregnancy and the Puerperium. *Neurologic Clinics*, *37*(1), 31-51. https://doi.org/10.1016/j.ncl.2018.09.004

Cipolla, M. J., & Kraig, R. P. (2011). Seizures in women with pre-eclampsia: Mechanisms and management. *Fetal and Maternal Medicine Review*, *22*(2), 91–108. https://doi.org/10.1017/S0965539511000040

Cunningham, F. G., Leveno, J. Kenneth., Bloom, L. Steven., Spong, Y. C., Dashe, S. Jodi., Hoffman, L. Barbara., Casey, M. Brian., & Sheffield, S. Jeanne. (2018). *Williams OBSTETRICS 25Th Edition* (Vol. 24).

Djaga, W., Tampubolon, R., & Prabowowati, H. (2020). Faktor-Faktor Penyebab Preeklamsia Studi Kasus Rekam Medik di Rumah Sakit Panti Wilasa Citarum Semarang. *Jurnal Keperawatan Muhammadiyah*, *5*(1), 313–319. https://doi.org/https://doi.org/10.30651/jkm.v5i2.4484

Elmeida, I. (2021). Tingkat Akurasi Jawaban Ibu Terhadap Pertanyaan tentang Komplikasi Persalinan di Provinsi Lampung. *[Dissertation]. Depok: Fakultas Kesehatan Masyarakat, Universitas Indonesia.*

Escobar, M. F., Nassar, A. H., Theron, G., Barnea, E. R., Nicholson, W., Ramasauskaite, D., Lloyd, I., Chandraharan, E., Miller, S., Burke, T., Ossanan, G., Andres Carvajal, J., Ramos, I., Hincapie, M. A., Loaiza, S., Nasner, D., Nassar, A. H., Visser, G. H., Barnea, E. R., … Wright, A. (2022). FIGO recommendations on the management of post-partum hemorrhage 2022. *International Journal of Gynecology and Obstetrics*, *157*(S1), 3–50. https://doi.org/10.1002/ijgo.14116

Firmansyah, Harahap, H., & Kurnia Juniarti, A. (2022). Studi Literature: Gambaran Determinan Kematian Maternal. *E-SEHAD*, *3*(1), 154–159. https://doi.org/https://doi.org/10.22437/esehad.v3i2.27767

Gyselaers, W. (2022). Hemodynamic Pathways of Gestational Hypertension and Pre-eclampsia. *American Journal of Obstetrics and Gynecology*, *226*(2), S988–S1005. https://doi.org/10.1016/j.ajog.2021.11.022

Hanley, G. E., Munro, S., Greyson, D., Gross, M. M., Hundley, V., Spiby, H., & Janssen, P. A. (2016). Diagnosing Onset of Labor: A Systematic Review of Definitions in The Research Literature. *BMC Pregnancy and Childbirth*, *16*(1). https://doi.org/10.1186/s12884-016-0857-4

Health Office Lampung Province. (2021). *Profil Kesehatan Provinsi Lampung Tahun 2021* Bandar Lampung: Dinas Kesehatan Provinsi Lampung.

Ives, C. W., Sinkey, R., Rajapreyar, I., Tita, A. T. N., & Oparil, S. (2020). Pre-eclampsia—Pathophysiology and Clinical Presentations: JACC State-of-the-Art Review. *Journal of the American College of Cardiology*, *76*(14), 1690–1702. https://doi.org/10.1016/j.jacc.2020.08.014

Karumanchi, S. A. (2016). Angiogenic factors in pre-eclampsia: From diagnosis to therapy. *Hypertension*, *67*(6), 1072–1079. https://doi.org/10.1161/HYPERTENSIONAHA.116.06421

Kurniadi, A., Tanumihardja, T., & Pradiptaloka, E. (2017). Status Proteinuria Dalam Kehamilan Di Kabupaten Sumba Barat Daya, Nusa Tenggara Timur Tahun 2016 Proteinuria Status in Pregnancy in Southwest Sumba District, East Nusa Tenggara in 2016. *Jurnal Kesehatan Reproduksi*, *8*(1), 53–61. https://doi.org/10.22435/kespro.v8i1.6332.53-61

Liu, Y., Gong, Q., Yuan, Y., & Shi, Q. (2023). Prediction model for labor dystocia occurring in the active phase. *Journal of Obstetrics and Gynaecology*, *43*(1). https://doi.org/10.1080/01443615.2023.2174837

Miller, E. C., & Vollbracht, S. (2021). Neurology of Pre-eclampsia and Related Disorders: an Update in Neuro-obstetrics. In *Current Pain and Headache Reports*, *25*(6). https://doi.org/10.1007/s11916-021-00958-z

Muzalfah, R., Santik Puspita, D. Y., & Wahyuningsih, S. A. (2018). Kejadian Preeklampsia pada Ibu Bersalin. *HIGEIA Journal Of Public Health Research and Development*, *2*(3), 417–428. https://doi.org/10.15294/higeia/v2i3/21390

Nahaee, J., Abbas-Alizadeh, F., Mirghafourvand, M., & Mohammad-Alizadeh-Charandabi, S. (2020). Pre-and during-labour predictors of dystocia in active phase of labour: A case-control study. *BMC Pregnancy and Childbirth*, *20*(1). https://doi.org/10.1186/s12884-020-03113-5

Nur, N. H., & Shahnyb, N. (2022). Faktor Risiko Kejadian Komplikasi Persalinan Ibu di Kabupaten Jeneponto. *Jambura Journal Of Health Science And Research*, *5*(1), 162–172. https://doi.org/https://doi.org/10.35971/jjhsr.v5i1.17161

Raffaelli, B., Siebert, E., Körner, J., Liman, T., Reuter, U., & Neeb, L. (2017). Characteristics and diagnoses of acute headache in pregnant women – a retrospective cross-sectional study. *Journal of Headache and Pain*, *18*(1). https://doi.org/10.1186/s10194-017-0823-1

Saputri, D., & Fransiska, P. (2023). Characteristics Of Pregnant Women With Pre-eclampsia. *Cendekia Medika : Jurnal STIKES Al-Ma'arif Baturaja*, *8*(1), 132–142. https://doi.org/10.52235/cendekiamedika.v8i1.221

Tanuwijaya, A. S., & Susanto, R. (2022). Prevalensi Komplikasi Kehamilan, Persalinan dan Nifas di Rumah Sakit X Jakarta Selama Periode Januari – Mei 2020. *Syntax Literate ; Jurnal Ilmiah Indonesia*, *7*(12), 18540–18557. https://doi.org/10.36418/syntax-literate.v7i12.10967

Vastra, A. R., Taufik, I., & Islamy, N. (2023). P3A0 Perdarahan Pasca Persalinan Pervaginam et causa Atonia Uteri: Laporan Kasus. *Medula*, *13*(6), 989–995. https://doi.org/https://doi.org/10.53089/medula.v13i6

Zwertbroek, E. F., Broekhuijsen, K., Langenveld, J., van Baaren, G. J., van den Berg, P. P., Bremer, H. A., Ganzevoort, W., van Loon, A. J., Mol, B. W. J., van Pampus, M. G., Perquin, D. A. M., Rijnders, R. J. P., Scheepers, H. C. J., Sikkema, M. J., Woiski, M. D., Groen, H., & Franssen, M. T. M. (2017). Prediction of progression to severe disease in women with late preterm hypertensive disorders of pregnancy. *Acta Obstetricia et Gynecologica Scandinavica*, *96*(1), 96–105. https://doi.org/10.1111/aogs.13051