ONLINE FIRST

SHORT SURVEY

Determinants of Maternal Characteristics Associated with Labor Complications

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ABSTRACT

OBJECTIVE: To determine which questions are most appropriate for describing the complications of childbirth experienced in research.
METHODOLOGY: An instrument was formed for a quantitative questionnaire for data collection with a cross-sectional study design of 300 respondents. The study was conducted at Abdoel Moeloek Regional Hospital, A. Dadi Tjokrodipo Regional Hospital and Kotaarang Community Health Center in January-June 2024. Inclusion criteria were women giving birth in the hospital obstetrics room with a diagnosis of postpartum hemorrhage, pre-eclampsia or eclampsia, Dystocia caused by uterine atony, uterine abnormalities, and mothers giving birth normally. The exclusion criteria were plans to move domicile from Lampung Province during the research and home addresses that were difficult to reach. Logistic regression was used to determine the most predictive questions regarding complications and each question item's accuracy, sensitivity, and specificity values . We use SPSS software to analyze data.
RESULTS: The study showed that this questionnaire could be used for survey research that asks about the accuracy of mothers' answers about complications of pre-eclampsia, bleeding, and Dystocia, with the highest accuracy value of 0.93, se. 90.7% and sp.98.2% on the questionnaire for pre-eclampsia; accuracy: 0.84, se.73.3%, and sp. 99.1% for the bleeding questionnaire, and accuracy values of 0.96, se.97.3%, sp. 98.7% for the dystocia questionnaire.
CONCLUSION: The questionnaire for the three groups of labor complications had a high accuracy value (> 70%). The survey times at the hospital and the mother's home were equally good.
KEYWORDS: Self-Reported, Childbirth Complications, Accuracy, Maternal Answers, Questionnaire

INTRODUCTION

The mother's statement regarding her answers and experiences regarding birth complications experienced by the mother is data that is very often used by most epidemiological studies because it is effective and relatively cheap compared to reviewing the mother's medical records[1]. In addition, collecting data on the mother's answers allows researchers to simultaneously collect other data not contained in the mother's medical records, such as lifestyle information. Although data on mothers' answers regarding their experience of giving birth with complications are often used, the validity of these data has rarely been confirmed [2]. Research regarding the level of accuracy of answers and mothers' experiences regarding the birth complications they experience is seldom conducted in Indonesia.

Childbirth complications and high risks, which are estimated to occur in 15-20% of pregnant women, are not detected early [3]. Not all of those detected have been handled promptly and adequately. Delays in the detection and treatment of birth complications can threaten the mother and the fetus [4]. Hemorrhage is the leading cause of death, primarily due to placental retention. The consequences of infections indicate inadequate efforts to prevent and treat infections during pregnancy and childbirth [5].

Accuracy of Mothers' Answers about Childbirth Complications A person's answers about health are generally good regarding the importance of maintaining health, understanding health problems, and the benefits of health for oneself and those around them [6]. People with negative answers about health tend to have low levels of compliance [7]. However, people with a positive answer to health will tend to be more compliant with what health workers recommend, including compliance with antenatal care visits [8]. Knowledge will influence a person's answers about what they see and feel and will result in changes in behavior according to the answer. The better the mother's level of knowledge about high-risk pregnancies, the better the importance of regular prenatal check-ups so that high-risk pregnancy factors or other pregnancy problems do not arise for her. This can make pregnant women enthusiastic about knowing the condition of their pregnancy and complying with antenatal care visits [9].

Pregnant women rarely know the severity of the complications they will experience. However, with the information received from the midwife or health worker who handles previous pregnancy checks, information on the severity of complications can be predicted, which allows pregnant women to improve their answers and perspectives regarding the severity of birth complications due to a lack of planning for delivery [10]. There are also many mothers' answers regarding birth complications that are inaccurate because some people think that blood spots coming out of the vagina are normal, even though it is a severe issue and should be checked by a gynecologist. Measuring the incidence of birth complications is quite tricky, especially if it is done; not all women give birth in health facilities, and the results show that most mothers find it challenging to report valid memory information about bleeding due to placenta previa [11]. Mothers who are vulnerable to birth complications must know the possible complications that may occur during delivery. The mother's memory at 4 months after giving birth was in the outstanding category for baby characteristic variables, namely sex, birth weight of the baby, gestational age, and multiple births [12].

This research aimed to find out what questions are most appropriate for describing birth complications experienced by mothers to be used in survey research. Hopefully, this research can guide the design of relevant and sensitive questions regarding maternal childbirth complications. In addition, it is hoped that the results of this research will contribute to improving the quality of maternal health services in the community.

METHODOLOGY

Research Design

The approach used in this study is quantitative. In this study, subjects were grouped into each group of birth complications, namely mothers with a history of labor with pre-eclampsia, bleeding, Dystocia, and labor without complications. After the questionnaire was formed, the subjects were interviewed using a questionnaire that had been formed, and each mother was asked using three questionnaires, namely, questionnaires about pre-eclampsia, bleeding, and Dystocia.

Research Location and Time

The study was conducted at two hospitals and one health center, Abdoel Moeloek Regional Hospital, A. Dadi Tjokrodipo Regional Hospital and Kotaarang Community Health Center, from January to June 2024.

Sample

The sample for cases in this study were women giving birth who came to the hospital and were diagnosed with bleeding, pre-eclampsia, eclampsia, or Dystocia who met the inclusion and exclusion criteria and mothers who gave birth without labor complications. Inclusion criteria were women giving birth in the hospital obstetrics room with a diagnosis of postpartum hemorrhage, pre-eclampsia or eclampsia, Dystocia (prolonged labor) caused by uterine atony (no surgery and only bimanual massage), uterine abnormalities, or other reasons; mothers giving birth normally; and mothers and husbands agreeing to be respondents. The exclusion criteria were plans to move domicile from Lampung Province during the research and home addresses that were difficult to reach, women who gave birth by operative procedures due to labour dystocia (unable to respond well within a specific time due to surgery). The quantitative sample size was determined according to the Lemeshow research formula for testing hypotheses of different proportions: 75 people for the type of birth complication of bleeding, 75 people of the kind of birth complication pre-eclampsia and eclampsia, 75 people for the type of birth complication of Dystocia, and 75 people for delivery without complications. The minimum sample size was 75 × 4 (300 people).

Data collection technique

A consecutive sampling method was used. Namely, the researcher took all subjects who met the requirements. Data were collected from two measurements. The first measurement was carried out while the mother was still in the hospital after the mother had undergone surgery during the birth process and had been moved to a room to rest. The second measurement was carried out at the mother's residence and 3 months after the mother gave birth, assuming the mother had passed the postpartum period. At this time, a postpartum mother is able to care for herself and her baby independently and adapt. This phase occurred when the mother returned home. The information obtained three months after the mother gave birth was also still at the recall bias level, which was insignificant. This information can be used for community survey methods.

Data analysis

The variables of bleeding, pre-eclampsia, eclampsia, and Dystocia, the validity of which was measured using the sensitivity and specificity of the questionnaire. Univariate analysis determined the frequency distribution or proportion according to the characteristics studied for all research variables. The measures used in this analysis are absolute numbers and

percentages because they are categorical data presented in tabular form. A multivariate logistic regression test, namely this analysis, is needed to determine which answers are most predictive for each group of birth complications. All answers to variable questions were linked to the gold standard: clinical diagnosis at the hospital. We use SPSS software to analyze data.

Research Instrument

The instrument used at this stage was a structured questionnaire that contained questions created based on literature reviews, previous research results, and qualitative study results. The interviewers were enumerators recruited from the midwifery alums of the Tanjungkarang Ministry of Health Polytechnic, a total of eight people who had been given training on answering equations and filling out questionnaires before the start of the research. The question items in the questionnaire were determined based on discussions with experts and validity tests, reliability tests, source triangulation, method triangulation, and data triangulation. The triangulation of sources was obtained by discussing with experts who worked in hospitals, health services, and educational elements. The triangulation discussion method explores information about the experience of the resource person while handling complicated cases in determining the question items and narrative sentences in the questionnaire. Data triangulation ensures that the obtained data are correctly included in the research criteria.

RESULTS

The mother respondents in this study varied, with the youngest age being 18 years and the oldest being 43 years, with an average age of 28 years. The highest number of gravidas was six pregnancies, and the highest parity was five, with an average of two to three pregnancies and births. Regarding knowledge scores about pregnancy and childbirth, some respondents still had low knowledge, with the lowest score being 2 and the highest being 16, with the average correct answer being 6-7. Further details can be found in **Table I**.

Table I: Sociodemographic Distribution of Age, Gravida, Parity Variables

Variable	Average	Min-max	Standard deviation
Age	28.1 years	18 – 43 years	6.7 years
Gravida	2.3 times	1 – 6 times	1.1 times
Parity	2.2 times	1 – 5 times	1.0 times
Knowledge	6.35 is correct	2 – 16 correct	2.4 correct

According to **Table II**, mothers with poor knowledge, limited access to information about pregnancy conditions, insufficient utilization of antenatal care (ANC), poor quality of ANC services, and last place of delivery have higher odds of experiencing pre-eclampsia complications. Mothers who did not use ANC had higher odds of experiencing complications. Lastly, mothers who gave birth at a health centre had lower odds of experiencing complications.

Factors such as education level, occupation, knowledge, referral decisions, pregnancy check location, ANC use, and delivery location significantly influenced mothers' responses to bleeding complications. Mothers with low education were more likely to report bleeding complications, whereas those without work and those with poor knowledge were more likely. Referral decisions made by others and not checked by health workers were also more probable. Lastly, mothers who gave birth at a health centre had lower odds of experiencing bleeding complications.

Factors such as decision-making for referral, history of previous complications, access to information about pregnancy conditions, use of antenatal care (ANC), last place of delivery, and chronic diseases (diabetes and cancer) significantly influenced maternal responses to dystocia complications. Mothers with a history of complications were more likely to answer these questions. Those without access to information or quality ANC were less likely to respond. Mothers who gave birth at a health centre or hospital were less likely to answer these questions.

Table II: Bivariate Analysis of Factors Associated with Mother's Answers about Pre-eclampsia Complications, Bleeding Complications, Complications of Dystocia

Variable	Category	Mother's Answers about Pre-eclampsia Complications		Total (%)	p-value	OR (95%CI)	Mother's Answer about Bleeding Complications		Total (%)	p-value	OR (95%CI)	Mother's Answer about Complications of Dystocia		Total (%)	p-value	OR (95%CI)
		No (%)	Yes (%)				No (%)	Yes (%)				No (%)	Yes (%)			
Age	Unrisky	157 (72.7%)	59 (27.3%)	216 (100%)	0.493	0.8 (0.4 – 1.4)	158 (73.1%)	58 (26.9%)	216 (100%)	0.331	1.4 (0.8 – 2.3)	155 (71.8%)	61 (28.2%)	216 (100%)	0.674	0.9 (0.4 – 1.5)
	Risky	65 (77.4%)	19 (22.6%)	84 (100%)			56 (66.7%)	28 (33.3%)	84 (100%)			63 (75%)	21 (25%)	84 (100%)		
Mother's Education Level	High	76 (76.2%)	25 (24.8%)	101 (100%)	0.832	1.1 (0.6 – 1.9)	82 (81.2%)	19 (18.8%)	101 (100%)	**0.011***	2.2 (1.2 – 3.9)	76 (75.2%)	25 (24.8%)	101 (100%)	0.564	1.2 (0.7 – 2.1)
	Low	146 (73.4%)	53 (26.6%)	199 (100%)			132 (66.3%)	67 (33.7%)	199 (100%)			142 (71.4%)	72 (28.6%)	199 (100%)		
Mother's Job	Yes	174 (74%)	61 (26%)	235 (100%)	1,000	1.0 (0.5 – 1.9)	176 (74.9%)	59 (25.1%)	235 (100%)	**0.015***	2.1 (1.2 – 3.8)	175 (74.5%)	60 (25.5%)	235 (100%)	0.240	1.5 (0.8 – 2.7)
	No	48 (73.8%)	17 (26.2%)	65 (100%)			38 (58.5%)	27 (41.5%)	65 (100%)			43 (66.2%)	22 (33.8%)	65 (100%)		
Knowledge of danger signs in pregnancy and childbirth	Good	179 (84.4%)	40 (18.3%)	219 (100%)	**<0.001***	3.9 (2.3 – 6.9)	70 (86.4) 144 (65.8%)	11 (13.6%)	81 (100%)	**0.001***	3.3 (1.7 – 6.6)	64 (79%)	17 (21%)	81 (100%)	0.176	1.6 (0.8 – 2.9)
	Poor	43 (53.1%)	38 (46.9%)	81 (100%)			70 (86.4) 144 (65.8%)	75 (34.2%)	219 (100%)			154 (70.3%)	65 (29.7%)	219 (100%)		
Gravida	Primigravida	70 (76.1)	22 (23.9)	92 (100%)	0.685	1.2 (0.7 – 2.1)	72 (78.3%)	20 (21.7%)	92 (100%)	0.104	1.7 (0.9 – 3.0)	63 (68.5%)	29 (31.5%)	92 (100%)	0.346	0.7 (0.4 – 1.3)
	Multigravida	152 (73.1%)	56 (26.9%)	208 (100%)			142 (68.3%)	66 (31.7%)	208 (100%)			155 (74.5%)	53 (25.5%)	208 (100%)		
Parity	≥ 4 times	27 (84.4%)	5 (15.6%)	32 (100%)	0.229	2.0 (0.8 – 5.5)	24 (75.0%)	8 (25.0%)	32 (100%)	0.781	1.2 (0.5 – 2.9)	23 (71.9%)	9 (28.1%)	32 (100%)	1,000	0.9 (0.4 – 2.2)
	1 – 3 times	195 (72.8%)	73 (27.2%)	268 (100%)			190 (70.9%)	64 (29.1%)	268 (100%)			195 (72.8%)	73 (27.2%)	268 (100%)		
Decision making refers	The decision to refer is determined by the mother	147 (71.4%)	57 (28.6%)	199 (100%)	0.185	0.7 (0.4 – 1.2)	151 (75.9%)	48 (24.1%)	199 (100%)	**0.021***	1.9 (1.1 – 3.2)	155 (77.9%)	44 (22.1%)	199 (100%)	**0.007***	2.1 (1.3 – 3.6)
	Referring decisions are	80 (79.2%)	21 (20.8%)	101 (100%)			63 (62.4%)	38 (37.6%)	101 (100%)			63 (62.4%)	38 (37.6%)	101 (100%)		

	determined by others															
Previous history of complications	No	195 (72.5%)	74 (27.5%)	269 (100%)	0.124	0.4 (0.1 – 1.1)	192 (71.4%)	77 (28.6%)	269 (100%)	1,000	1.0 (0.4 – 2.3)	202 (75.1%)	67 (24.9%)	269 (100%)	**0.010***	2.8 (1.3 – 6.0)
	Yes	27 (87.1%)	4 (12.9%)	31 (100%)			22 (71.0%)	9 (29.0%)	31 (100%)			16 (72.7%)	15 (48.4%)	31 (100%)		
Access information about Pregnancy Conditions	Have Access to Information	213 (76.1%)	67 (23.9%)	280 (100%)	**0.005***	3.9 (1.5 – 9.8)	201 (71.8%)	79 (28.2%)	280 (100%)	0.695	1.4 (0.5 – 3.6)	199 (71.1%)	81 (28.9%)	280 (100%)	**0.039***	0.1 (0.1 -0.9)
	No access to information	9 (45%)	11 (55%)	20 (100%)			13 (65%)	7 (35%)	20 (100%)			19 (95%)	1 (5%)	20 (100%)		
Access information about danger signs in pregnancy and childbirth	Have Access to Information	208 (73.2%)	76 (23.9%)	284 (100%)	0.255	0.4 (0.1 – 1.8)	206 (72.5%)	78 (27.5%)	284 (100%)	0.083	2.6 (0.9 – 7.3)	204 (71.8%)	80 (28.2%)	284 (100%)	0.251	0.4 (0.1 – 1.6)
	No access to information	14 (87.5%)	2 (12.5%)	16 (100%)			8 (50%)	8 (50%)	16 (100%)			14 (87.5%)	2 (12.5%)	16 (100%)		
Access information obtained from the KIA book	Yes	22 (53.7%)	19 (46.3%)	41 (100%)	**0.003***	0.3 (0.2 – 0.7)	37 (90.2%)	4 (9.8%)	41 (100%)	**0.007***	4.3 (1.5 – 12.4)	28 (68.3%)	13 (31.7%)	41 (100%)	0.626	0.8 (0.4 – 1.6)
	No	200 (77.2%)	59 (22.8%)	259 (100%)			177 (68.3%)	82 (31.7%)	259 (100%)			190 (73.4%)	69 (26.6%)	259 (100%)		
Place where mothers check their pregnancy (ANC place)	Competent Health Personnel	204 (75.3%)	67 (24.7%)	271 (100%)	0.126	1.9 (0.8 – 4.1)	199 (73.4%)	72 (26.6%)	271 (100%)	**0.025***	2.6 (1.2 – 5.6)	197 (72.7%)	74 (27.3%)	271 (100%)	1,000	1.0 (0.4 – 2.4)
	Not a Health Personnel	18 (62.1%)	11 (37.9%)	29 (100%)			15 (51.7%)	14 (48.3%)	29 (100%)			21 (72.4%)	8 (27.6%)	29 (100%)		
ANC utilization	Yes	159 (79.5%)	41 (20.5%)	200 (100%)	**0.003***	2.3 (1.3 – 3.9)	151 (75.5%)	49 (24.5%)	200 (100%)	**0.034***	1.8 (1.1 – 3.0)	137 (68.5%)	63 (31.5%)	200 (100%)	**0.031***	0.5 (0.3 – 0.9)
	No	63 (63%)	37 (37%)	100 (100%)			63 (63%)	37 (37%)	100 (100%)			81 (81%)	19 (19%)	100 (100%)		
ANC Service Quality	Good ANC	114 (79.7%)	29 (20.3%)	143 (100%)	**0.043***	1.8 (1.1 – 3.0)	95 (66.4%)	48 (33.6%)	143 (100%)	0.096	0.6 (0.4 – 1.0)	112 (78.3%)	31 (21.7%)	143 (100%)	**0.049***	1.7 (1.0 – 2.9)
	Poor ANC	108 (68.8%)	49 (31.2%)	157 (100%)			119 (75.8%)	38 (24.2%)	157 (100%)			106 (67.5%)	51 (32.5%	157 (100%)		
Chronic disease	No	212 (74.9%)	71 (25.1%)	283 (100%)	0.158	2.1 (0.8 – 5.7)	200 (70.7%)	83 (29.3%)	283 (100%)	0.412	0.5 (0.1 – 1.8)	202 (71.4%)	81 (28.6%)	283 (100%)	**0.048***	0.2 (0.02 – 1.2)
	Yes	10 (58.8%)	7 (41.2%)	17 (100%)			14 (82.4%)	3 (17.6%)	17 (100%)			16 (94.1%)	1 (5.9%)	17 (100%)		

Table III shows that the multivariate analysis revealed six variables directly related to a mother's answers about pre-eclampsia complications: knowledge of danger signs, decision-making, access to information, utilization of ANC, and quality of ANC services. The most influential variable was the utilization of ANC, with an OR value of 3.0 times greater after controlling for other variables. The study found four variables directly related to a mother's answer about bleeding complications: knowledge about danger signs in pregnancy and childbirth, access to information about these signs, quality of ANC services, and last place of delivery. The confounding variables included gravity and the decision maker's referral. Access to information is the most influential variable. The study revealed three variables directly related to a mother's perception of dystocia complications: decision to refer, use of ANC, and quality of ANC services, and four confounding variables: mother's occupation, history of complications, access to information, and chronic diseases. The decision to refer had the most significant influence on dystocia perception.

Table III: Final modelling

Final Modeling of Multivariate Analysis of Factors Influencing Mother's Answers about Pre-eclamptic Complications						
Variable	**B**	**S.E**	**P-value**	**OR**	**95% confidence interval**	
					Lowest	**Highest**
Knowledge of danger signs in pregnancy and childbirth	-1.3	0.5	0.009	0.3	0.1	0.7
Decision making refers	0.8	0.3	0.014	0.4	0.2	0.8
Access information about pregnancy conditions	1.1	0.5	0.036	2.9	1.1	7.8
Access information obtained from the KIA book	-1.5	0.4	<0.001	0.2	0.1	0.5
Place where the mother checks her pregnancy (ANC place)	0.7	0.5	0.135	1.9	0.8	4.8
ANC utilization	1.1	0.3	0.001	3.0	1.5	5.8
ANC service quality	0.8	0.3	0.017	2.2	1.1	4.0
Constant	0.6	0.5	0.232	1.8		

Final Modeling of Multivariate Analysis of Influencing Factors with Mother's Answers about Bleeding Complications						
Variable	**B**	**S.E**	**P-value**	**OR**	**95% confidence interval**	
					Lowest	**Highest**
Mother's job	0.5	0.3	0.124	1.7	0.9	3.2
Knowledge of danger signs in pregnancy and	1.0	0.4	0.011	2.7	1..3	5.9

childbirth						
Gravida	0.4	0.3	0.244	1.5	0.7	2.8
Decision making refers	0.5	0.3	0.084	1.7	0.9	3.0
Access information about danger signs in pregnancy and childbirth	0.9	0.6	0.133	2.3	0.8	7.2
Access information obtained from the KIA book	1.0	0.6	0.072	2.9	0.9	9.2
Place where the mother checks her pregnancy	0.6	0.4	0.151	1.9	0.8	4.4
(ANC place)	0.4	0.3	0.265	1.4	0.8	2.7
ANC utilization						
ANC Service Quality	-1.1	0.3	<0.001	0.3	0.2	0.6
Constant	-2.9	0.6	0,000	0.052		

Final modeling of Multivariate Analysis of Influencing Factors with Mother's Answers about Dystocia Complications

Variable	B	S.E	P-value	OR	95% confidence interval	
					Lowest	Lowest
Mother's job	0.5	0.3	0.161	1.6	0.8	3.2
Decision making refers	0.8	0.3	0.005	2.3	1.3	4.1
Previous history of complications	0.8	0.4	0.062	2.2	0.9	5.1
Access information about pregnancy conditions	-2.0	1.1	0.056	0.1	0.1	1.1
ANC utilization	-1.0	0.4	0.003	0.4	0.2	0.7
ANC Service Quality	0.8	0.3	0.007	2.2	1.2	3.9
Chronic disease	-1.8	1.1	0.089	0.2	0.1	01.3
Constant	-1.5	0.2	<0.001	0.2		

DISCUSSION

The results of the accuracy test show that this questionnaire is highly accurate in distinguishing between mothers with normal labor and mothers with obstetric complications. The highest accuracy achieved was 95%. In statement item no. 6 on questions for pre-eclampsia by 96%, question no. 4 for bleeding by 98% no: 1 (96%), and 5 (91%) on the questionnaire for Dystocia. This accuracy value shows that approximately 95% of mothers interviewed using this questionnaire will obtain the same results as the results of the gold standard examination. The specificity and sensitivity of the questionnaire further support its effectiveness in distinguishing between normal labor and complications [13].

The highest sensitivity was 98%. This sensitivity value shows that this questionnaire can detect around 98% of cases of obstetric complications from all mothers who are declared to have experienced obstetric complications based on the gold standard examination. The highest sensitivity value is found in statement item no: 1 on the questionnaire for Dystocia. This indicates that the questionnaire is highly effective in accurately identifying cases of Dystocia. The high sensitivity value suggests the questionnaire can be a valuable tool in detecting and intervening in obstetric complications [14].

The specificity value obtained was 97%. This specificity value shows that the questionnaire can detect around 97% of mothers giving birth normally (not experiencing obstetric complications) from all mothers declared normal (not experiencing obstetric complications) based on the gold standard examination. The highest specificity values are found in statement items 1, 3 and 4 on the questionnaire for pre-eclampsia and eclampsia. These values show that this questionnaire has relatively good accuracy in differentiating mothers with obstetric complications such as Pre-eclampsia, bleeding and Dystocia. By utilizing targeted questioning, healthcare professionals can better prioritize resources and provide individualized care to pregnant women at risk for pre-eclampsia and eclampsia [15].

In this accuracy test, sensitivity, specificity and accuracy values are obtained. Sensitivity is an index that shows the accuracy of a measuring instrument in identifying people who are categorized as positive by the gold standard. Specificity is an index that shows the accuracy of a measuring instrument in identifying people who are categorized as unfavourable by the gold standard [16]. A measuring instrument has high validity if it has a sensitivity and specificity score close to 100% [17]. A measuring instrument with a sensitivity and specificity closer to 100% indicates that the instrument is increasingly valid [18]. A high validity score suggests that the instrument can accurately identify both true positive and true negative cases, making it a reliable tool for measurement and assessment [19].

After comparing the results of the accuracy test of the mother's questionnaire with Pre-eclampsia between the time at the hospital and home, it is found in question item No. 6, namely, "Did the health worker say that the mother's blood pressure was high during pregnancy or just before giving birth?" (150 or more)." The results showed a significant difference in responses between the hospital and home settings, with a higher percentage of mothers reporting that health workers mentioned high blood pressure at home. This discrepancy highlights the importance of consistent and accurate communication between healthcare providers and patients in both settings. Ensuring that information about pre-eclampsia is consistently conveyed to patients in both hospital and home settings can help improve awareness and early detection of this condition. Clear communication can also help in providing appropriate care and support to pregnant women at risk of pre-eclampsia [20].

The best sensitivity and specificity values are in questions about Pre-eclampsia No. 6 . with sensitivity values: 90.7% (in hospital) with 96.0% (at home) CI 83.4-97.0%, specificity: 96.0% (in hospital) with 95.6% (at home) CI97.5-100, Positive predictive value: 98.6 95% CI 90.7-99.8%, Negative predictive value:97.4% with 95% CI 94.5-98.8%, accuracy value in RS

93%, at home 96%. This accuracy value shows that around 93% and 96% of mothers interviewed using this questionnaire will get the same results as the gold standard examination results. The high sensitivity, specificity, and positive and negative predictive values further support its effectiveness as a screening tool for Pre-eclampsia [21].

After comparing the results of the accuracy test in the hospital with those at home, it turned out that the best results in the accuracy value of the bleeding questionnaire were found at home. This suggests the patient may feel more comfortable and relaxed in their home environment, leading to more accurate responses. It is essential to consider these factors when evaluating the effectiveness of medical assessments in different settings. Additionally, the familiar surroundings of the home may reduce any anxiety or stress that could affect the accuracy of the responses [22]. Considering these environmental factors can help healthcare providers make more informed decisions regarding patient care.

The best sensitivity and specificity in the hospital was found in question No. 2, namely "Did the mother experience bleeding that continued to flow?" with a sensitivity value of 73.3% CI: 61.9% - 82.9% and a specificity of 95.6%. CI: 92% - 97.8% and accuracy value 84%. Meanwhile, when the mother is at home, the highest accuracy value is found in question No. 4, namely, "Does the mother seem to have a lot of blood clots after giving birth?" with a sensitivity value of 100% CI: 95.2% -100%, specificity 95.1% CI: 91.4 – 97.5%, accuracy value of 98%. The high sensitivity and specificity values further support its reliability in identifying potential cases of excessive bleeding postpartum [23]. These findings suggest that question No. 4 is a strong indicator for identifying excessive bleeding postpartum in mothers at home. The high accuracy value reinforces the importance of this question in assessing postpartum hemorrhage risk.

The best sensitivity and specificity values for the question about dystocia complications in the hospital were found in question No. 2, namely "Was the mother's labor time more than or a day and a night?" with a sensitivity value of 97.3% CI: 90.7% – 99.7% and a specificity of 93.8% CI: 89.9% - 96.6% and an accuracy value of 96%%. Meanwhile, when the mother is at home, the highest accuracy value is found in question No. 1, namely "Is the mother's delivery time more than 24 hours?" with a sensitivity value of 96.0% CI: 88.8% -99.2%, specificity 96.4% CI: 93.1 – 98.5%, accuracy value of 96%. These results indicate that asking about the duration of labor can be a valuable indicator for predicting dystocia complications in hospital and home settings. The high sensitivity and specificity values suggest this question is reliable in identifying potential issues [24].

CONCLUSION

Analysis of Se, Sp and Accuracy for Pre-eclampsia/eclampsia shows that all questions are accurate. Of the seven questions, it turns out that four questions are most predictive of pre-eclampsia/eclampsia complications based on multivariate analysis. The Se, Sp and Accuracy on Bleeding analysis results show five questions with high accuracy. Of the five questions about bleeding, it turns out that all the questions above have a high predictive level for bleeding complications based on multivariate analysis. The results of the Se, Sp and Accuracy analysis of Dystocia showed that 5 out of 6 questions had high accuracy. Of the six questions, it turned out that five questions were predictive of dystocia complications based on multivariate analysis. This list of questions has a high level of accuracy; it is recommended that survey organizers use these questions for survey research on childbirth complications so that the picture of complications can be seen entirely and authentically so that program planning can be more precise.

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AUTHOR CONTRIBUTION

Elmeida IF**:** Acquisition, analysis, interpretation of data for the work, Drafting the work and revising, Final approval
Nurlaila N: interpretation of data for the work, Drafting the work, Revising Manuscript
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