A VALIDATION STUDY OF WOMEN'S REPORT AND RECALL OF MAJOR COMPLICATIONS TREATED AT LAMPUNG PROVINCE, INDONESIA

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Abstract

Background: Hypotension during pregnancy, obstructed labor, hemorrhage, and sepsis are the most common reasons for maternal mortality. Researchers in underdeveloped nations have long relied on health and demographic surveys to learn about perinatal and maternal health. Nevertheless, officially validated questionnaires have been utilized in very few countrywide demographic surveys. This study set out to answer the question, "How reliable are mothers' self-reports of obstetrical complications" Approach: A cross-sectional study was carried out with 300 pregnant women at two hospitals and one public health center. The mothers' perceptions of obstetrical issues were documented by a questionnaire, while the hospital medical records were reviewed. Predictive values, sensitivity, and specificity as well as percentage agreement were achieved for the obstetrical condition. Finding: Medical diagnoses of obstetrical problems did not always reflect what women reported. Reporting eclampsia had the highest level of agreement, while postpartum hemorrhage had the lowest. Conclusion: Because each study uses a unique questionnaire, the validity of the questionnaires differs. This restriction must be considered when interpreting health surveys that rely on mothers reporting their own health.

Keywords: Women Self-Reported; Near Miss; Obstetric Complication; Demographic Health Survey; Epidemiology.

INTRODUCTION

Maternal mortality rate in Indonesia is still high in the amount of 359/100.000 live birth or is the main health problem in the community. The decrease of maternal and neonatal death becomes the health indicator not only the mother and the kids, but also the community and the sign of strong or weak of health system of a country. The slow decrease of maternal and neonatal death makes maternal and neonatal death as the global issue (WHO, 2018a).

Obstetric complication on pregnant women and women in labor is the complex problem because the complication itself can cause death directly on the pregnant women or women in labor. In Nigeria, there are 50.000 women die every year because of pregnancy complication and labor (Daniel,et. al., 2012), in Nepal there are 4.500 women die every year with the same cause (Hibstu et. al., 2017). In the amount of 25% of mother's death occur during the first 24 hours since the labor and 50% death occurs in one week after the labor, both cases are caused by pregnancy complication (Kabakyenga, 2011). The same thing occurs in Nairobidengan, the main cause of the mother's death is pregnancy and labor complication such as abortion, haemorrhage, sepsis, eclampsia, and uterine rupture (Mbalinda, 2014).

The mother's statement about her perception and experience on obstetric complication experienced is the most frequent data used by most epidemiology research. Collecting the data in the form of the mother's report (self-reported) is the most general technique of data collection used by the researcher because it is the

most effective and the cheapest way compared to reviewing the mother's medical record.

Beside that, collecting the data of mother's perception makes the researcher capable of simultaneously collect other data that are not obtained in the mother's medical record such as the information about her life style. Even though the data of the mother's perception about the labor experience with obstetric complication are frequently used but the validity of these data are rarely confirmed.

Erdene et. al. (2013) who investigate about the validity of mother's perception in Canada concerning the labor experience towards the electronic medical record wrote that in Canada, the mother's perception about their labor experience is not validated on their medical record. Likewise in Indonesia, in most survey based research, the researcher only counted on the report of the mother's perception concerning their labor experience and rarely validated by their medical record.

The Objective of the study the main goal of this study was to validate interview data on obstetric complications by comparing women's reporting with data obtained from their medical records.

METHODS

This research was a longitudinal survey with cross-sectional design which is the part of observational study, namely dependent variable and independent variable were collected at the same time. The research location was at two hospitals namely RSUD Abdoel Moeloek and RSUD A. Dadi Tjokrodipo and one community health center namely Kotakarang Community Health Center in October 2019 until done. RSUD Abdoel Moeloek is type a hospital residing in Bandar Lampung City which becomes the highest reference in Lampung Province for the case of obstetric complication.

While RSUD A. Dadi Tjokrodipo is a hospital owned by municipality government of Bandar Lampung and it is type C hospital, also becomes the reference for obstetric complication case in Bandar Lampung City and Kotakarang Community Health Center is an inpatient community health center in Bandar Lampung and also accepts normal parturition patients.

In the amount of 300 mothers with details of 75 mothers deliver with pre-eclampsia or eclampsia, 75 mothers with post-partum haemorrhogic, and 75 mothers with dystosia, and 75 mothers of normal delivery without obstetric complication. These 300 mothers were asked by using arranged questionnaires. Their Spontaneouseous answers and probing answers were differentiated. The yes answer in Spontaneouseous answer will automatically include yes in the probing ones.

Statistical Analyses: We compared the answers to each question based on their sensitivity, specificity, PPV, and percentage of agreement. The sensitivity of a diagnostic test is defined as the proportion of women who accurately reported having a certain problem out of all those women who were tested.

One measure of specificity is the proportion of women who accurately reported not having a certain problem out of all those who did not have a diagnosis of that complication. The prevalence of a reported problem among women who were actually diagnosed with that complication is known as its positive predictive value. The % agreement measures how well the moms' self-reports matched up with the clinical diagnosis.

RESULTS

Out of 300 mothers in labor, 75 mothers are with pre-eclampsia and eclampsia, 75 mothers are with post-partum haemorrogic, 75 mothers are with dystocia and 75 mothers delivering without complication, then it can be concluded as follows:

1. The values of Sensitivity, Specificity, Positive Predictive Value (PPV), Negative Predictive Value (NPV), Accuracy and Kappa in group of Mothers with PEB

No	Question Item	Spontaneouseous		Total		Probing		Total	
		PEB	Normal			PEB	Normal		
1	A moment before the labor				Sensitivity :23%				Sensitivity :31%
	or during the labor, did you				Specificity : 93%				Specificity : 93%
	Feel pain in the epigastrium?				PPV: 77%				PPV: 82%
	Yes	17	5 (22,7)		NPP: 54%	23 (82,1)	5 (17,9)	28 (100)	NPP: 58%
	No	(77,3)	70 (54,7)	22 (100)	Accuracy: 58%	52 (42,6)	70 (57,4)	120 (100)	Accuracy: 62%
		58		128 (100)	Kappa: 0,16				Kappa:0,24
		(45,3)							
2	During this pregnancy or a				Sensitivity :71%				Sensitivity :75%
	moment before the labor, did				Specificity : 97%				Specificity : 95%
	you feel headache?	53	2 (3,6)	55 (100)	PPV: 96%				PPV: 93%
	Yes	(96,3)	73 (76,9)	95 (100)	NPP: 77%	56 (93,3)	4 (6,7)	60 (100)	NPP: 79%
	No	22			Accuracy: 84%	19 (21,1)	71 (78,9)	90 (100)	Accuracy: 84%
		(23,2)			Kappa: 0,68				Kappa: 0,70
3	During this pregnancy or a				Sensitivity :29%				Sensitivity :37%
	moment before the labor, did				Specificity : 95%				Specificity : 93%
	you feel that your eyes sight	22	4 (15,4)	26 (100)	PPV: 85%	28 (84)	5 (15,2)	33 (100)	PPV: 85%
	is blur?	(84,6)	71 (57,3)	124 (100)	NPP: 57%	47(40,2)	70 (59,9)	117 (100)	NPP: 59%
	Yes	53			Accuracy: 62%				Accuracy: 65%
	No	(42,7)			Kappa: 0,24				Kappa: 0,31
4	Did you ever suffer cramp				Sensitivity :78%				Sensitivity :85%
	(beside epilepsy) during the				Specificity : 96%				Specificity : 95%
	pregnancy?	59	3 (4,9)	62 (100)	PPV: 95%	64 (94,1)	4 (5,9)	68 (100)	PPV: 94%
	Yes	(95,1)	72 (81,9)	88 (100)	NPP: 82%	11 (13,4)	71 (86,6)	82 (100)	NPP: 87%

No	Q							
	No	16			Accuracy: 87%				Accuracy: 90%
		(18,2)			Kappa: 0,75				Kappa: 0,80
5	Did you ever suffer cramp				Sensitivity :84%				Sensitivity :93%
	(beside epilepsy) during the				Specificity : 97%				Specificity : 96%
	labor process?				PPV: 97%				PPV:96%
	Yes	63 (97)	2 (3,1)	65 (100)	NPP: 86%	70 (95)	3 (4,1)	73 (100)	NPP: 92%
	No	12	73 (85,9)	85 (100)	Accuracy: 91%	5(6,5)	72 (93,5)	77 (100)	Accuracy: 94%
		(14,1)			Kappa: 0,82				Kappa: 0,90
6	Was during the pregnancy or				Sensitivity :83%				Sensitivity :91%
	a moment before the labor				Specificity : 94%				Specificity : 93%
	your blood pressure is high?				PPV: 94%				PPV: 93%
	Yes	62 (93)	4 (6,1)	66 (100)	NPP: 85%	68 (93,1)	5 (6,9)	73 (100)	NPP: 90%
	No	13	71 (84,5)	84 (100)	Accuracy: 88%	7 (9,0)	70 (90)	77 (100)	Accuracy: 92%
		(15,5)			Kappa: 0,78				Kappa : 0,84
7	Did the result of laboratory				Sensitivity :88%				Sensitivity :96%
	examination on your urine				Specificity : 95%				Specificity : 93%
	show that there is protein in				PPV: 94%				PPV: 94%
	it?	66 (94)	4 (5,7)	70 (100)	NPP: 88%	72 (93,5)	5 (6,5)	77 (100)	NPP: 95%
	Yes	9 (11,3)	71(88,8)	80 (100)	Accuracy: 91%	3 (4,1)	70 (95,9)	73 (100)	Accuracy: 95%
	No				Kappa: 0,83				Kappa: 0,90

In table 1 seen that the value of Sensitivity is low (29% and probing 37%), there is a question "During this pregnancy or a moment before the labor, did you feel your eyes sight is blur?" this question item is not sensitive because the mother will be difficult in remembering if during their pregnancy or during the labor their eyes sight got blur. Most of the mothers close their eyes when they pushing even though the midwife will remind them to keep their eyes open when they push.

The sensitivity value is also small (23% and probing 31%) in the question item "A mong before the labor or during the labor, did you feel pain in your epigastrium?". This question is also not sensitive because in general the labor mother will feel pain in all their stomach and not only in epigastrium, but also in the waist and back also feeling the pain.

The kappa value in both of these questions are also small namely 0,16 and 0,24. The value of sensitivity, Specificity, PPV, NPV, and Kappa in the other question item have high value.

Table 2: The Value of Sensitivity, Specificity, Positive Predictive Value (PPV), Negative Predictive Value (NPV), Accuracy, and Kappa in the group of Mothers with haemorrhage

No	The Question Item	Spontaneouseous		Total		Probing		Total	
		PEB	Normal			PEB	Normal		
1	Did you feel that you experience				Sensitivity :28%				Sensitivity :39%
	so much haemorrhage?				Specificity : 92%				Specificity : 88%
	Yes				PPV: 78%				PPV: 76%
	No	21 (77,8)	56	27 (100)	NPP: 56%	29 (76,3)	9 (23,7)	38 (100)	NPP: 59%
		54 (43,9)	(22,2)	123 (100)	Accuracy: 60%	46 (41,1)	66 (58,9)	112 (100)	Accuracy: 63%
			69 (56,1)		Kappa: 0,20				Kappa
2	Did you experience haemorrhage				Sensitivity :83%				Sensitivity :89%
	that keep flowing?				Specificity : 96%				Specificity : 89%
	Yes	62 (95,4)	3(4,7)	65 (100)	PPV: 95%				PPV: 89%
	No	13 (15,3)	72 (84,7)	85 (100)	NPP: 85%	67 (89,3)	8 (10,7)	75 (100)	NPP: 89%
					Accuracy: 89%	8 (10,7)	67 (89,3)	75 (100)	Accuracy: 89%
					Kappa: 0,79				Kappa: 0,79
3	Did you experience pouring out				Sensitivity :80%				Sensitivity :88%
	haemorrhage?				Specificity : 93%				Specificity : 93%
	Yes	60 (92,3)	5 (7,7)	65 (100)	PPV: 92%				PPV: 93%
	No	15 (17,6)	70 (82,4)	85 (100)	NPP: 82%	66 (92,9)	5 (7,1)	71 (100)	NPP: 88%
					Accuracy: 86%	9 (11,4)	70 (88,6)	79 (100)	Accuracy: 91%
					Kappa: 0,74				Kappa: 0,82
4	Did you feel like releasing so				Sensitivity :81%				Sensitivity :92%
	much blood clots after the labor?				Specificity : 92%				Specificity : 91%
	Yes	61 (91,1)	6 (8,9)	67 (100)	PPV: 91%	69 (90,8)	7(9,2)	76(100)	PPV: 91%
	No	14(16,9)	69 (83,1)	83 (100)	NPP: 83%	6 (8,1)	68 (91,9)	74 (100)	NPP: 91%
					Accuracy: 87%				Accuracy: 91%
					Kappa: 0,73				Kappa: 0,84
5	Did the midwife or the medical				Sensitivity :89%				Sensitivity :96%
	health seem panic and said to you				Specificity : 93%				Specificity : 89%
	that you experience	67 (93,1)	5 (7)	72 (100)	PPV:93%	72 (90)	8 (10)	80 (100)	PPV: 90%
	haemorrhage?	8 (10,3)	70 (89,8)	78 (100)	NPP: 89%	3 (4,3)	67 (95,7)	70 (100)	NPP: 96%
	Yes				Accuracy: 91%				Accuracy: 93%
	No				Kappa: 0,83				Kappa: 0,85
6	Did during the labor you release				Sensitivity :69%				Sensitivity :94%
	so much blood until you feel that				Specificity :89%				Specificity : 89%

	PEB	Normal	Total		PEB	Normal	Total	
you will die that time?				PPV:86%				PPV: 91%
Yes				NPP: 74%				NPP: 94%
No	52 (86,7)	8 (13,3)	60 (100)	Accuracy: 79%	71 (89,9)	8 (10,1)	79 (100)	Accuracy: 92%
	23 (25,6)	67 (74,5)	90 (100)	Kappa: 0,59	4 (5,7)	67 (94,4)	71 (100)	Kappa: 0,84

In table 2 seen the lowest value of Sensitivity is obtained at question "Did you feel experiencing much haemorrhage?" this occurs because the mother who delivers the baby feels that in the labor they must release much blood, until they do not feel that releasing much blood is something dangerous for them.

Table 3: The Values of Sensitivity, Specificity, Positive Predictive Value (PPV), Negative Predictive Value (NPV), Accuracy and Kappa on the group of Mothers with Dystocia

No	Question Item	Spontaneous		Total		Probing		Total	
		PEB	Normal			PEB	Normal		
1	Was your labor more than 24 hours?				Sensitivity :91%				Sensitivity :98%
					Specificity : 94%				Specificity : 92%
	Yes	68 (94,4)	4 (5,6)	72 (100)	PPV: 91%				PPV: 92%
	No	7 (8,9)	71 (91)	78 (100)	NPP: 91%	74 (92,5)	6 (7,5)	80 (100)	NPP: 98%
					Accuracy: 93%	1 (1,4)	69 (98,6)	70 (100)	Accuracy: 95%
					Kappa: 0,85				Kappa: 0,91
2	Was your labor time one day one				Sensitivity :81%				Sensitivity :94%
	night or more than that?				Specificity : 97%				Specificity : 95%
	Yes				PPV: 96%				PPV:95%
	No	61 (96,8)	2 (3,2)	63 (100)	NPP: 84%	70 (94,6)	4 (5,4)	74 (100)	NPP: 93%
		14 (16,1)	73 (83,9)	87 (100)	Accuracy: 89%	5 (6,6)	71 (93,4)	76 (100)	Accuracy: 94%
					Kappa: 0,79				Kappa: 0,89
3	Did you deliver the baby with breech position?				Sensitivity :64%				Sensitivity :86%
					Specificity : 96%				Specificity : 95
	Yes	48 (94,1)	3 (5,9)	51 (100)	PPV: 94%	65 (94,2)	4 (5,8)	69 (100)	PPV:94%
	No	27(27,3)	72 (72,7)	99 (100)	NPP: 73%	10 (12,3)	71 (87,6)	81 (100)	NPP: 88%
					Accuracy: 80%				Accuracy: 91%
					Kappa: 0,60				Kappa: 0,82
4	Did your labor take much time until the labor process was				Sensitivity :16%				Sensitivity :69%
					Specificity : 96%				Specificity : 95%

#	Question								
	assisted with vacuum or				PPV: 80%				PPV: 92%
	"aspirated" or using "pliers"?	12 (80)	3 (20)	15 (100)	NPP: 53%	52 (92,9)	4 (7,2)	56 (100)	NPP: 76%
	Yes	63 (46,7)	72 (53,3)	135 (100)	Accuracy: 56%	23 (24,5)	71 (75,5)	94 (100)	Accuracy: 82%
	No				Kappa: 0,21				Kappa: 0,65
5	Did your labor take much time				Sensitivity :82%				Sensitivity :97%
	and there was no aperture until				Specificity : 96%				Specificity :92%
	caesar surgery must be done?				PPV: 95%				PPV: 92%
	Yes	62 (95,4)	3 (4,7)	65 (100)	NPP: 85%	73 (92,4)	6 (7,6)	79 (100)	NPP: 97%
	No	13 (15,3)	72 (84,8)	85(100)	Accuracy: 89%	2 (2,8)	69 (97,2)	71 (100)	Accuracy: 95%
					Kappa: 0,79				Kappa: 0,90
6	Did your heartburn feeling take				Sensitivity :88%				Sensitivity :97%
	one day one night and the baby				Specificity : 96%				Specificity : 93%
	had no intention to force you				PPV: 95%				PPV: 93%
	pushing?	66 (95,7)	3 (4,4)	69 (100)	NPP: 89%	73 (93,6)	5 (6,4)	78 (100)	NPP:97%
	Yes	9 (11,1)	72 (88,9)	81 (100)	Accuracy: 56%	2 (2,8)	70 (97,2)	72 (100)	Accuracy: 95%
	No				Kappa: 0,79				Kappa: 0,90

In table 2 seen the value of low Sensitivity is 16% in question item "Did your labor take much time until the labor process must be assisted by using vacuum or "aspirated" or using "pliers"?

This question is not sensitive during the Mother's spontaneous answer because recently the treatment using vacuum and forcep is rarely found, but when probing or read, the sensitivity increases to 69%.

While the highest sensitivity value is 88% in question item "Was your laber more than 24 hours?" this proves that the labor mother with dystocia because of long parturition will strongly remember that they had endured pain or heartburn for 24 hours, but the baby was not born yet.

DISCUSSION

Results of this study suggest that women are able to report accurately on multiple aspects of care received during the postnatal period. In this research the highest Sensitivity value is obtained in the mother with long parturition (dystocia). The highest Sensitivity value is 88% obtained in question item "Was your labor time more than 24 hours?" this proves that the labor women with dystocia because of long parturition will strongly remember that they had endured pain or heartburn for 24 hours but they baby was not born yet.

This research proves that in a couple of things, the perception of mother did not same with the medical diagnosis enforced by the doctor at the hospital.

The average perception of mothers in the group of dystocia obstetric complication has the highest accuracy compared to the haemorrhage group, Pre-eclampsia and eclampsia, and normal.

This research can inform the factor which plays roles on the women who experience obstetric complication. The problem solution of the complication service in certain area considers the factors of result findings from this research that play roles during the survey research until revealing the true occurance in order to do precise treatment or implication.

For the ministry of health and Public Health Office of Lampung Province, through the findings on the validity of mother's perception concerning obstetric complication, expected to be the valuable feeback in the program plan and program intervention and guide the strategy in improving the access and quality of maternal health service. The information about accuracy level of perception towards obstetric complication is namely haemorrhage, pre-eclampsia/eclampsia, and dystocia owning influence towards the mother's perception on the importance of the effort fo search for help, if the mother's perception about obstetric complication is not accurate, then it will slow down to obtain help.

For the survey about the cause of mother's death will give different description about the prevalence of the obstetric complication, until it can influence the priority of the management program. To the community about the validity of the mother's experience report about obstetric complication, compared to the medical diagnosis, and giving information to the community that pregnancy and labor have risk of complication, until it is necessary to do regular pregnancy check, following the class of pregnant women to know the treatment and sign of pregnancy and labor complication, doing labor at the health facility and if owning risk factor, do the labor at the hospital. And a week after the labor, do post labor check at the health facility.

CONCLUSION

In this research the highest Sensitivity value is obtained in the mother with long parturition. This research proves that in a couple of things, the perception of mother did not same with the medical diagnosis enforced by the doctor at the hospital.

The average perception of mothers in the group of Pre-eclampsia and eclampsia obstetric complication has the highest accuracy compared to the haemorrhage group, dystocia, and normal. The validity of the surveys questionnaires varies between studies due to differences in the questionnaire. Health surveys based on maternal self-report must be interpreted with consideration of this limitation.

References

1) Bat-Erdene U, Metcalfe A, McDonald SW, Tough SC. (2013). Evidence from electronic health data to support the recollection of labor and delivery events by Canadian moms. BMC Pregnancy Childbirth ;13(Suppl

2) Buka SL, Goldstein JM, Spartos E,Tsuang MT. (2004) The retrospective measurement of prenatal and perinatalevents: acuracy of maternal recall. Schizophr res; 71:417-26

3) Dietz P.,Bombard J., Mulready WC., Gauthier J., Sackof J., Brozicevic P., Gambatse M.,Funke MN., England L., Harrison L., Taylor A (2014). Validation of self-reported maternal and infant helath indicators in the pregnancy risk assesment monitoring. Matern Child Health J. 18:2489-2498.

4) Duckitt, K., & Harrington, D. (2005). Risk factors for pre-eclampsia at antenatal booking: systematic review of controlled studies. Bmj, 330(7491), 565.

5) Ellison GT, Wet T,matshitze Kp,Cooper P.The reliability and Validityof selfreported

6) Erdene UB., Metcalfe A., McDonald SW.,Tough SC., (2013). Evidence from electronic health records supporting the recollection of labor and delivery events by a Canadian mother. BMC Pregnancy and childbirth.13. 1471-2393.

7) Filippi V, Ganaba R, Baggaley R, Marshall T, Storeng KT, Sombie I, Ouattara F, Oueddraogo T, Akoum M, Meda N. (2007). A longitudinal research on the health of women in Burkina Faso following severe maternal complications. The Lancet;Oct ;370,9595; Proquest.

8) Filippi V, Ronsmans C, Gandaho T, Graham W,Alihonou E< Santos P.(2000). Womens Reports of severe (near-miss) obstetric complications in Benin. Stud Fam Plann; 31:309-24.

9) Filippi V, Marshall T, Bulut A, Graham W, Yolsal N. (1997). Asking question about womens reproductive health: validity and reliability of survey findings from Istanbul. Trop Med Int Helath ;2.47-56

10) Firoz, T., Chou, D., von Dadelszen, P., Agrawal, P., Vanderkruik, R., Tunçalp, O., . . . Say, L. (2013). Measuring maternal health: Focus on maternal morbidity.World Health Organization.Bulletin of the World Health Organization, 91(10), 794-6. Retrieved from https://remotelib.ui.ac.id:2155/docview/1447243697?accountid=17242

11) Joao P. Souza, Mary A. Parpinelli, Aliana Amaral, Jose G. Cecatti. (2007). To better understand the frequency of maternal morbidities, population surveys employing validated questionnaires have been conducted. Journal of clinical epidemiology;61.169-176

12) Keenan K., Hipwell A., McaloonR., Hoffmann A., Mohanny A., Magee K., (2015). Concordance between maternal recall of birth complication and data from obstetrical records. Early human development.105; 11-15.

13) Ronsmans C., (2009). Severe acute maternal morbidity in low-income countries. Best Practice & Research Clinical Obstetrics and Gynaecology 23. 305–316

14) Ronsmans C, Achadi E,Cohen s, Zazri A.(1997) Womens Recall of Obstetric Complications in South Kalimantan Indonesia. Stud Fam Plann; 28:203-14.

15) Rosenstein, M. G., Romero, M., & Ramos, S. (2008). Maternal mortality in Argentina: a closer look at women who die outside of the health system. Maternal and child health journal, 12(4), 519-524.

16) Soeane G, Castrillo M, O'Rourke K, (1998). A Validationstudy of maternal self-reports of obstetrical complications: implications for health surveys. Int J gynecol Obstet; 62:229-36.

17) Sloan NL, Amoaful E, Arthur P,Winikoff B, Adjei S.lidity of womens self-reported obstetric complicationin Rural Ghana. J Health Popul Nutr 2001; 19(2):45-51

18) Stewart MK, Festin M. Validation study of womens reportingand recall of major obstetric complication treated at the Philippine General Hospital. Int J Gynecol Obstet 1995;48 (suppl): S53-66

19) Souza, J. P., Jose, G. C., Haddad, S. M., Parpinelli, M. A., Costa, M. L., Katz, L., . . . by the Brazilian Network for Surveillance of Severe Maternal Morbidity Group (2012). Models for maternal severity index (MSI) and the World Health Organization's maternal near-miss strategy: Methods for evaluating the care of high-risk mothers. PLoS One, 7(8) doi: http://remote-lib.ui.ac.id:2090/10.1371/journal.pone.0044129

20) Sou SC, Chen WJ, Hsieh WS, Jeng SF. Severe obstetric complica- tions and birth characteristics in preterm or term delivery were accurately recalled by mothers. J Clin Epidemiol 2006; 59:429e35.

21) Yego Faith, et al (2014). Causes of maternal death at a tertiary care hospital in Kenya: a randomized controlled trial. BMC Labor and delivery, 1-26 http://doi.org/10.1016/SO140-6736 (10)60747-7

Appendixes:

Research Variables of Obstetric Complication

• **Pre-eclampsia or eclampsia**

No.	Question	Spontaneous Answer	Probing Answer (read)
1	A moment before the labor or during the labor, did you feel pain in the epigastrium?	Yes /No	Yes /No
2	During this pregnancy or a moment before the labor, did you feel headache?	Yes /No	Yes /No
3	During this pregnancy or a moment before the labor, did you feel your eyes sight blur?	Yes /No	Yes /No
4	Did you ever suffer cramp (beside epilepsy) during pregnancy?	Yes /No	Yes /No
5	Did you ever suffer cramp (beside epilepsy) during the labor process?	Yes /No	Yes /No
6	Was during pregnancy or a moment before the labor your blood pressure is high? (150 or more)	Yes /No	Yes /No
7	Was the result of laboratory check on your urine shows there is protein in it?	Yes /No	Yes /No

• **Haemorrhage**

1	Did you feel that you experience so much haemorrhage?	Yes /No	Yes /No
2	Did you experience haemorrhage which keeps flowing?	Yes /No	Yes /No
	Did you experience pouring out haemorrhage?	Yes /No	Yes /No
4	Did you release many blod clots after the labor?	Yes /No	Yes /No
5	Did the midwife or medical staff seem panic and say that you experience haemorrhage?	Yes /No	Yes /No
6	Did during the labor you release so much blood until you feel that you will die?	Yes /No	Yes /No

• **Dystocia**

1	Was your labor time more than 24 hours?	Yes /No	Yes /No
2	Was your labor time one day one night or more?	Yes /No	Yes /No
3	Did you deliver the baby in breech position?	Yes /No	Yes /No
4	Did your labor take long time until the labor process was assisted with vacuum tool or "aspirated" or using "pliers"?	Yes /No	Yes /No
5	Did your labor take long time and there was no "aperture" until must be done caesar surgery?	Yes /No	Yes /No
6	Was your heartburn more than one day one night and the baby still does not trigger you to do pushing?	Yes /No	Yes /No