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The Role of Fetal Health Locus of Control and Obedience in Traditional Pregnancy Care Toward Low Birth Weight (LBW) Occurrence in Kupang

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ABSTRACT

Prevalence and mortality due to low birth weight (LBW) is still get a mark in Kupang. The multifactorial causes of LBW, can be grouped into these factors: physical and social environment, mother, fetus, placenta-umbilical cord, and health services. From maternal factors, there are subfactors of maternal characteristics, knowledge of pregnancy, maternal health status, and behavior in caring the pregnancy. Maternal behavior may be in the form of obedience in traditional pregnancy care, which may lead to LBW. Most studies on LBW risk factors are related to clinical medical factors. The purpose of this study was to predict the role of fetal health locus of control and obedience in traditional pregnancy care, toward LBW occurrence. This study was an analytic observational with case-control design, included 50 mothers who gave birth to LBW and 50 mothers who gave birth to normal babies, through interviews and tracing of maternal and infant medical records. Research was done in RSUD Prof. DR. W.Z. Johannes, RSIA Dedari and 2 basic emergency obstetric and newborn care (BEmONC) public health center. Data analysis done using SmartPLS 3.2.6. The results of the study proved that obedience to traditional pregnancy care was a mediator of the occurrence of LBW, whereas fetal health locus of control was not. Obedience to traditional pregnancy care in the form of non-standardize antenatal care and continued heavy workload during pregnancy, had been shown to cause LBW. This research also found 2 pathway models of LBW occurrence: 1) Mother's characteristic (education level, mother's income, total of family income) influence to LBW occurrence through variables: pregnancy knowledge, perceived behavioral control, and obedience to traditional pregnancy care. 2) Maternal characteristics have an effect on the occurrence of LBW through obedience to traditional pregnancy care.

Keywords: Low birth weight, Obedience, Traditional pregnancy care, Fetal health locus of control

INTRODUCTION

Low birth weight infant (LBW) is important indicator to general health status in the world and one of the main causes of neonatal death⁽¹⁾. The prevalence of LBW is 10-20% of all live birth every year with 95% occur in developing countries⁽²⁾. Riskesdas 2010 show the prevalence of LBW infant in Indonesia is 11.1%, with the highest prevalence is on East Nusa Tenggara (NTT) 19.2% and the lowest is on West Sumatra 6.0%⁽³⁾. On 2013, Riskesdas prevalence researched showed decrease of LBW infant to 10.2%⁽⁴⁾.

Preliminary study done on Prof. DR. W.Z. Johannes Hospital, Kupang with 28 participant during June 2015 showed 10 (35.71%) mothers had LBW infant. Most of the pregnant mothers (71.43%) done the antenatal care (ANC) since the first trimester and 45% of them still had LBW infant. Among mothers who had ANC less than 4 times during pregnancy, 40% had LBW infant. Among forty-two percent (42.86%) pregnant mothers were abstain for certain food, 50% of them had LBW infant. There were 17 (60.72%) pregnant mothers who still work with heavy intensity during pregnant and 29.4% of them had LBW infant. On January to March 2016 in Kupang city there were 27 (10.55%) low birth weight infant from 256 live births (unpublished data).

Health Locus of Control (HLOC) is the degree to which individuals believe that their health status is controlled by internal or external factors⁽⁵⁾. A person is said to have an internal HLOC if he/she believes that his/her health status is the result of behavior on his/her own decision. It is said to have an external HLOC, if he/she believes that his/her health status is determined by chance, fate, luck (*Chance HLOC*) or whether it is determined by forces outside itself, such as health system, health personels, culture, or other people (*Powerful others HLOC*). A person with dominant internal locus of control (ILOC) will tend to practice healthy behavior

and have a higher degree of health. Furthermore, in relation to the health of pregnancy and the fetus being conceived, it is known as the fetal health locus of control (FHLOC). Fetal Health Locus of Control scale is a scale that could predict maternal health-related behavior during pregnancy⁽⁶⁾.

Causes of LBW infant is multifactors, classified into: physical and social environment, mother, placenta-umbilical, and health service. Mother's education, mother's health status, mother's behavior is the mother's factors that could influence the unborn infant^{(1),(7),(8)}.

The theory of planned behavior (TPB) was proposed by Icek Ajzen in 1985 through his article "From intentions to actions: A theory of planned behavior." The theory was developed from the theory of reasoned action, which was proposed by Martin Fishbein together with Icek Ajzen in 1980. According to the theory of reasoned action, if people evaluate the suggested behavior as positive (attitude), and if they think their significant others want them to perform the behavior (subjective norm), this results in a higher intention (motivations) and they are more likely to do so. In fact, the theory of planned behavior differs from the theory of reasoned action in its addition of perceived behavioral control. Perceived behavioral control (PBC) plays an important part in the theory of planned behavior⁽⁹⁾.

Mother's behavior during pregnancy could influence by local culture. The culture could be strong enough and influence mother's behavior who live in the social network (family and kinship). Social dominance theory argues that the major forms of intergroup conflict, are all basically derived from the basic human predisposition to form and maintain hierarchical and group-based systems of social organization⁽¹⁰⁾.

Some statement said from mothers who gave birth of low birth weight babies in the preliminary study in Kupang:

"nenek bilang beta sonde bole makan gurita dan cumi, takut ada apa-apa dengan kaki beta pung anak" (ibu MF, 27 tahun). (My grandmother said that I must avoid eating octopus and squid, fear that something happened with my baby's feet, (Ms. MF, 27 years))

"mesti urut perut karna kandungan talalu di bawa, supaya lahir lancar" (ibu ET, 31 tahun). (Massage on abdomen during pregnancy must be done, it could make the delivery process smoothly, (Ms. ET, 31 years))

"orang hamil sonde bole banyak tidur, musti kerja: ambil air, angkat kayu, jalan-jalan, kerja berat supaya melahirkan tidak susah, kalo tidur musti hadap samping" (ibu WS, 19 tahun) (Pregnant mothers must works, not sleep too much; bring water, lift fire woods, walking, hard works so the delivery process will be smooth. You have to facing sideways during sleep (Ms. WS, 19 years)).

All of the statements above figure out that some local culture influence the behavior during pregnancy. In pregnancy behavior, the people on East Nusa Tenggara had culture that delivered from one generation to the next generation. In ethnography study, pregnant mothers in East Sumba beside do ANC in midwife also met traditional midwife every month to massage in the abdomen area. In Rote ethnic, there is no special treatment in pregnant mothers such as decreasing daily workload, eating the nutritious food, or doing certain ritual ceremony. In Limakoli-Rote, pregnant mothers do the heavy works since second trimesters until the third trimester. Most mothers there, works in field from 6 am to 7 pm where the location have difficult access⁽¹¹⁾. In Manggarai ethnic mostly in Wae Codi village, the reason why pregnant mothers have to works on the field for the whole day long is to avoid demons interfere their unborn infants⁽¹²⁾.

This study aimed to predict the role of mother's fetal health locus of control and the obedience in traditional pregnancy care, as the mediator variables of LBW occurrence in Kupang, East Nusa Tenggara.

METHODS

This study was an analytic observational with case control design. Sample on each group was 50 (LBW and normal birth weight). Inclusion criteria were: mother with spontaneous birth, singleton pregnancy, ever receive the comprehensive antenatal care. Exclusion criteria were: twisted umbilical cord, placenta weight less than 500 gram, congenital malformation, mothers with uncompleted medical record (body weight data). Data was collected using questionnaire and tracing of mother and infant medical records. The research location was on Kupang city, in Prof. DR. W.Z. Johannes hospital, Dedari hospital, Sikumana public health center and Bakunase public health center from December 2016 - May 2017. Data were analyzed with *Partial Least Squares* (PLS).

RESULTS

The respondent's characteristic showed in table 1. There were 50 mothers who gave birth to LBW and 50 mothers who gave the normal weight infant. Path analysis was done to explain the relationship pattern between variables and to predict the direct and indirect effect of a set of independent variables (exogenous) to the dependent variable (endogenous). It could explain the phenomena being studied and can predict the value of the dependent variable based on the independent variable. Path analysis in this research done using Partial Least Square (PLS) method. Model or path algorithm (path model) is a diagram that links independent variables, intermediate variables and dependent variables.

Table 1. The distribution of mother's characteristics

No	Respondent Characteristic	LBW		Normal weight		Total	
		Frequency	Percent	Frequency	Percent	Frequency	Percent
1.	Age						
	Risky (< 20 y, > 35 y)	12	24.0	4	8.0	16	16.0
	Not Risky (20-35 y)	38	76.0	46	92.0	84	84.0
2.	Education						
	Not graduated from elementary school	2	4.0	0	0.0	2	2.0
	Elementary school	8	16.0	17	34.0	25	25.0
	Junior high school	4	8.0	7	14.0	11	11.0
	Senior high school	32	64.0	18	36.0	50	50.0
	University	4	8.0	8	16.0	12	12.0
3.	Mother's income						
	Yes	16	32.0	17	34.0	33	33.0
	No	34	68.0	33	66.0	67	67.0
4.	Family's Income						
	< 1.500.000	32	64.0	29	58.0	61	61.0
	> 1.500.000	18	36.0	21	42.0	39	39.0
5.	Marital status						
	Legitimated	27	54.0	34	68.0	61	61.0
	Illegitimated	23	46.0	16	32.0	39	39.0
6.	Child value						
	Low	1	2.0	0	0.0	1	1.0
	High	49	98.0	50	100.0	99	99.0
7.	Parity						
	High	17	34.0	22	44.0	39	39.0
	Low	33	66.0	28	56.0	61	61.0
8.	Time between pregnancies						
	Bad	12	24.0	6	12.0	18	18.0
	Good	38	76.0	44	88.0	82	82.0
9.	History of having LBW						
	Yes	7	14.0	8	16.0	15	15.0
	No	43	86.0	42	84.0	85	85.0
10.	Family pattern						
	Core family	23	46.0	41	82.0	64	64.0
	With parent	11	22.0	3	6.0	14	14.0
	With parent in- law	5	10.0	2	4.0	7	7.0
	With brother/sister	11	22.0	4	8.0	15	15.0

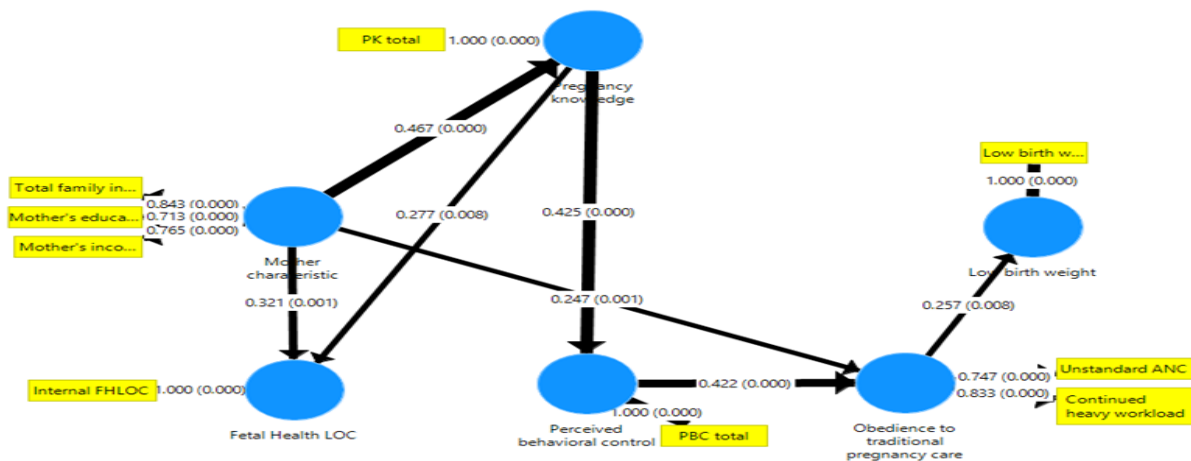


Figure 1. Path model of LBW occurrence

Figure 1. describe the model of LBW occurrence with the significant indicators of mother’s characteristic are: mother’s education level, mother’s own income, and total family income. Significant indicator for FHLOC is the internal FHLOC, and indicators for the obedience in traditional pregnancy care are: non standardized ANC and continued heavy workload during pregnancy. Table 2. and table 3 describe the loadings factor of the model and the path coefficient of the inner model.

Table 2. Factor loadings of the outer model

Latent variable	Indicator	Original Sample	T-statistics	p-value
Mother characteristic	Mother’s education	0.713	9.724	0.000
	Mother’s income	0.765	11.285	0.000
	Total family’s income	0.843	26.348	0.000
Obedience to traditional pregnancy care	Unstandardized antenatal care	0.747	9.247	0.000
	Continued heavy workload during pregnancy	0.833	16.787	0.000

Table 3. Path coefficient, T statistics and p value of the inner model

	Original Sample	T-statistics	p-value
Mother characteristic → Fetal Health LOC	0.321	3.314	0.001
Mother characteristic → Obedience to traditional pregnancy care	0.247	3.273	0.001
Mother characteristic → Pregnancy knowledge	0.467	4.776	0.000
Obedience to traditional pregnancy care → Low birth weight	0.257	2.665	0.008
Perceived behavioral control → Obedience to traditional pregnancy care	0.422	5.356	0.000
Pregnancy knowledge → Fetal Health LOC	0.277	2.655	0.008
Pregnancy knowledge → Perceived behavioral control	0.425	4.448	0.000

Cross tabulation also done for the purpose of confirmation and explanation the relationship between variables described in path model.

Table 4. Relationship between perceived behavioral control and non standardized ANC

Perceived behavioral control	Non standardized ANC		Total
	Yes	No	
Lack	2 (100.0%)	0 (0.0%)	2 (100.0%)
Good	42 (42.9%)	56 (57.1%)	98 (100.0%)

Table 5. Relationship between perceived behavioral control and workload during pregnancy

Perceived behavioral control	Heavy workload during pregnancy		Total
	Yes	No	
Lack	2 (100.0%)	0 (0.0%)	2 (100.0%)
Good	26 (26.5%)	72 (73.5%)	98 (100.0%)

Table 4 and 5 showed that there were two respondent with lack of PBC score, both had unstandardized antenatal care. Mothers with good PBC score had more standardized antenatal care (57.1%) than whom not (42.9%). Among mothers who had a good PBC 26,5% still continued heavy workload during pregnancy and also all mothers with lack PBC.

Table 6. Relationship between obedience in traditional pregnancy care and the occurrence of LBW infant

Obedience in traditional pregnancy care	LBW		Total
	Yes	No	
Non standardized ANC			
Yes	26 (59.1%)	18 (40.9%)	44 (100.0%)
No	24 (42.9%)	32 (57.1%)	56 (100.0%)
Heavy workload during pregnancy			
Yes	19 (67.9%)	9 (32.1%)	28 (100.0%)
No	31 (43.1%)	41 (56.9%)	72 (100.0%)

DISCUSSION

The relationship of respondent characteristics and LBW

The respondent’s age who classified as the risky age for pregnancy had more LBW babies than non risky age. This result along with another study that stated mother with risky age for pregnancies had more incidence of

LBW^{(13),(14),(15),(16)}. In this study, maternal age had no significant association with LBW which is consistent with studies conducted by Negi⁽¹⁷⁾ and Pinzon-Rondon, et al.⁽¹⁸⁾. Mother who had LBW infant had better education than whom not, with 72% of them had senior high school level and above. This study is contradiction with Rini and Trisna, where mothers who had low education had risk of 19.2 times to have LBW infant. Among mothers who had work during pregnancy, there more LBW infant than whom not (50% vs 32%)⁽¹⁹⁾. Irlandia studies result there were significant correlation between mothers who had heavy activities with LBW infant occurrence⁽²⁰⁾. Most respondent (67%) doesn't have her own income, with low total family's income but there were no significant difference of LBW occurrence in both groups. From marital status data, 39% of them had illegitimate status. Illegitimate status if there the marriage has not been settled customarily or religiously. The large number of illegitimate marital status because in all ethnic groups in NTT there were a dowry culture called *belis*, which is need much money and many family couldn't finished their marriage obligation. This illegitimated status could have an impact on the mother's psychological status and affect her pregnancy care practice. There were 30% respondent who lived in with parents and 8% lived in with parent-in-law. This study along with Sharma, et al. study in Nepal, which stated that extended family had more LBW-SGA infant birth than core family⁽²¹⁾.

The role of FHLOC and obedience to traditional pregnancy care toward LBW occurrence

Structural model from the whole study result, showed on figure 1.

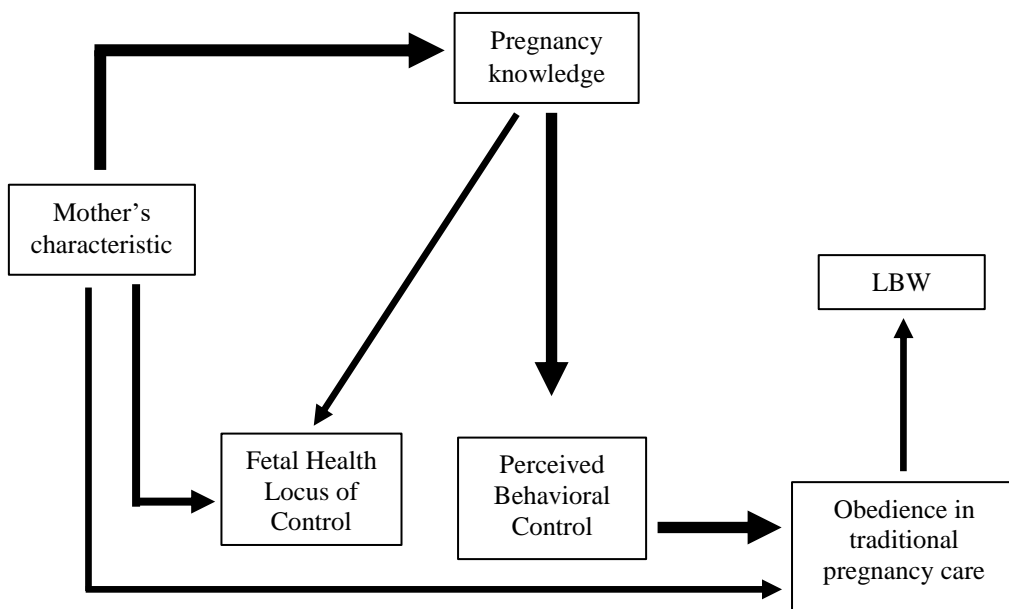


Figure 2. Pathways of the LBW occurrence

Figure 2 mentioned that there are two significant pathways for LBW occurrence. The first pathway is: the mother's characteristic affect the knowledge of pregnancy, knowledge of pregnancy will influence the PBC, PBC affect the obedience in traditional pregnancy care and ended with the occurrence of LBW infant. Second pathway is the characteristics of the mother will influence the obedience in traditional pregnancy care and correlated with LBW occurrence.

Mother's characteristic which are significant as the indicator are mother's education, family's income, and mother's own income. These indicators reflects the women's status in the community, which could affect her behavior in caring her pregnancy. Mother's characteristic also significant to predict the knowledge of mothers about pregnancy care with path coefficient 0.467 and p value 0.000. Mother's knowledge about pregnancy care had positive influence to perceived behavioral control with path coefficient 0.425 and p-value 0.000. The results of this study are in line with the research in Thailand, resulting in a positive and significant influence of environmental knowledge to consumer's PBC in purchasing the green products⁽²²⁾. From this study almost all of the respondent have good perceived behavioral control (PBC) and there were no significant difference between two groups. Perceived behavior control is a person's belief about his ability to perform an action, about the ease or difficulty in performing a behavior, or can be said also as a person's readiness to perform an action⁽²³⁾. Perceived behavioral control can predict the behavioral intention and then to the action or behavior, but the perception of behavior control can also be a direct antecedent of the action^{(9),(23)}.

Respondent's data about family patterns show that more LBW infant born from respondent who lived with extended family. Extended family pattern will influence the obedience of the mothers to traditional pregnancy care.

The path analysis proved that the obedience in traditional pregnancy care affect the LBW occurrence with the path coefficient of 0.257 and p value 0.009. Table 6. showed 44% of pregnant women had non standard antenatal care, and had the tendency to give birth to LBW compared to women with standard ANC (59.1% vs 42.9%). Roberts, et al. found that traditional beliefs associated with pregnancy in Malawi in the form of treatment by village elders, obedience to spouses and concealment of pregnancy are also supported by the same beliefs that are adhered to by health care workers. This causes the implementation of non standard antenatal care⁽²⁴⁾.

Fortier, et al. found that the risk of birth to LBW-SGA increased in pregnant women who worked at least 6 hours a day and with a standing position continuously⁽²⁵⁾. Mothers with heavy physical workload, in this case as farmers, are at risk of giving birth to LBW⁽¹⁶⁾. Risvi, et al. found that the proportion of mothers who could take a rest in the midday was greater in the group of mothers who gave birth to babies with normal birth weight⁽¹³⁾. Low family income and working mothers are risk factors for LBW-SGA also found by Li, et al. in a national-scale study in Sweden⁽²⁶⁾. Maternal employment in the field of transportation, food preparation services, factory workers is a LBW-SGA risk factor among Latin immigrants in Los Angeles, California⁽²⁷⁾. The results of several studies above in accordance with this study, where mothers who work hard during pregnancy tends to give birth to LBW, and amongs the LBW 80% is SGA.

The result of structural model analysis, found that the effect of FHLOC on the obedience in traditional pregnancy care was not significant. From the analysis also found stronger influence from PBC to obedience in traditional pregnancy care. It can be explained that FHLOC is something that is general, but if it is related to specific behavior, there are still many factors that can affect.

There are some study limitations. First, the location of research is in the city area where the access of information and education is good enough. The second limitation is the timing of mother's FHLOC measurement is after birth that could influence the results.

CONCLUSION

Obedience in traditional pregnancy care was proved as a mediator of the occurrence of LBW. Fetal health locus of control was not related to the occurrence of LBW in Kupang. Indicators of obedience in traditional pregnancy care were: non-standard antenatal care and continued of heavy workload during pregnancy. The study also produced two significant pathways for the LBW occurrence, that were: the characteristics of mothers affected to LBW occurrence through variables: knowledge about pregnancy, PBC and obedience in traditional pregnancy care. The second pathway was: maternal characteristics directly affects obedience in traditional pregnancy care, and further affect the LBW occurrence. Suggestions to be given are: strengthening women's position with improving skills and family income, counseling on pregnancy and child growth during marriage preparation courses, optimizing the use of KIA books as a source of knowledge about pregnancy, optimizing pregnant women's classes as a platform to increase knowledge and PBC, avoiding hard work during pregnancy, and performing standardized antenatal care.

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