

Healthy Childbirth Model Based on Husband's Support in Poor Families in Deli Serdang, North Sumatra Province, Indonesia

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Abstract Maternal mortality is a health problem still receiving global attention, especially in developing countries. The Indonesian government has made efforts to improve the health status of pregnant and childbirth women, yet an acceleration is needed so that the targets to decrease maternal mortality can be achieved. A total of 315 mothers with children aged 0–11 months old were randomly selected using cluster sampling. Data were collected through questionnaires and interviews upon respondents' consent. Questionnaires included the husband's support, mother's behavior, access to health services, mother's psychology, and healthy childbirth variables. Statistical analysis was performed using SmartPLS version 3.2.9, and a multivariate non-parametric statistical approach was employed. Our study observed a significant direct effect among all variables, namely: husband's support ($\beta=0.266$, $t=5.454$, and $p=0.001$), mother's behavior ($\beta=0.110$, $t=2.159$, and $p=0.031$), access to health services ($\beta=0.106$, $t=2.209$, and $p=0.028$), mother's psychology ($\beta=0.405$, $t=8.054$, and $p=0.001$), and healthy childbirth. The husband's support indirectly influences healthy childbirth through the mother's behavior ($\beta=0.022$, $t=1.990$, and $p=0.047$) and her psychology ($\beta=0.103$, $t=3.683$, and $p=0.001$). However, there was no significant effect between the husband's support and healthy childbirth through access to health services ($\beta=0.014$, $t=1.804$, and $p=0.072$). A

healthy childbirth model based on the husband's support could be used to increase maternal health and prevent maternal death in poor families.

Keywords Maternal Mortality, Husband's Support, Healthy Childbirth, Mother's Psychology, Mother's Behavior

1. Introduction

Maternal mortality is a health problem still receiving global attention, especially in developing countries with slow progress [1]. Efforts to reduce global maternal mortality have been launched since 1987 through a joint commitment by countries in the world through several actions and strategies such as the Safe Motherhood Initiative (SMI)[2], Millennium Development Goals (MDGs), Sustainable Development Goals (SDGs), and Ending Preventable Maternal Mortality (EPMM) Initiative, which were initiated by WHO [3]. The Indonesian government has also made efforts to improve the health status of pregnant and childbirth women, such as "Gerakan Sayang Ibu" (translated to Love Mother Movement) in 1996, "Suami Siaga" (translated to Alert Husband) in 1998[4], [5] and Making Pregnancy Safer (MPS) policy in

2000. Efforts that have been made so far have indeed decreased the maternal mortality rate, but an acceleration is needed so that the targets set can be achieved.

Globally, the maternal mortality rate (MMR) has declined from 342 deaths per 100,000 live births in 2000 to 211 deaths per 100,000 live births in 2017[6]. However, MMR in Indonesia in 2020 was recorded at 4.627 deaths, and this figure has increased compared to that in 2019, which was recorded as many as 4.221 deaths. North Sumatra Province is the largest contributor to MMR in Indonesia in 2020 for provinces outside Java [7]. MMR in North Sumatra Province showed a relatively stagnant trend from 2017 to 2020. In 2017, MMR was recorded at 194 people and then decreased slightly to 186 in 2018. It experienced another increase in 2019 to 202 and decreased slightly in 2020 to 187 [8]. Deli Serdang Regency is the second largest district in North Sumatra Province and also the third largest contributor to maternal mortality, of which the majority came from poor families.

One of the strategies to prevent maternal death is to provide healthcare at adequate health facilities accompanied by health professionals [3]. Additionally, some studies stated that the husband's support for pregnant wives has a significant relationship with the level of maternal health during pregnancy and after childbirth [9], [10]. The husband's support will reduce the stress and depression levels of pregnant and childbirth women [11] and can increase the utilization of health facilities and professional health workers to carry out pregnancy and childbirth care [3], [12]. A thorough study of the involvement of husbands in the care of pregnant women is important [28]. Therefore, this study aimed to analyze and develop a healthy childbirth model in the Deli Serdang District, based on the husband's support in a poor family to prevent maternal death.

2. Materials and Methods

2.1. Study Participants and Eligibility Criteria

This study used a cluster sampling technique to determine its participants. Of the 22 sub-districts in Deli Serdang Regency, seven were selected with the criteria of high MMR and the largest number of poor people. To calculate the sample size, Isaac and Michael's calculation formula was used with an error rate of 5 percent [13]. A total of 312 mothers were randomly selected, between 40 to 45 mothers in each sub-district. The inclusion criteria were mothers with children aged 0–11 months, who were recipients of Family Hope Assistance (government aid program for poor families), and residents of the Deli Serdang Regency. The exclusion criteria were widowed or divorced mothers with adopted children and a history of diseases such as heart disease, diabetes, epilepsy, hypertension, psychiatric disorders, kidney disease, HIV/AIDS, hepatitis, sexually transmitted diseases, and tuberculosis.

2.2. Data Collection and Study Variables

Data were collected through questionnaires and interviews from April to July 2022, which included the husband's support, mother's behavior, access to health services, the mother's psychology, and healthy childbirth variables. The husband's support variable consisted of instrumental, informational, emotional, and appreciation support. The mother's behavior variable consisted of nutritional intake using a modified food frequency questionnaire (FFQ), use of birth control, workload, age of pregnancy, birth spacing, and parity. Access to health services variable consisted of antenatal care (ANC), childbirth assistance, place of childbirth, and childbirth funding. Mother's psychology variable consisted of self-esteem assessed using the Rosenberg Self-Esteem (RSE) questionnaire, self-confidence and anxiety assessed using the Hamilton Rating Scale for Anxiety (HARS), and emotional levels. Finally, the healthy childbirth variable was assessed from the status of complications before the childbirth process.

2.3. Statistical Analyses

Statistical analysis was performed using SmartPLS version 3.2.9. A multivariate non-parametric statistical approach was implemented. The type of multivariate test used is structural equation modeling (SEM) with a partial least squares (PLS) approach using a structural model (inner model) for validation and reliability tests and a measurement model (outer model) for causality tests. This method can simultaneously test the measurement model as well as the structural model. The measurement model tests validation and reliability, while the structural model tests causality (testing hypotheses with predictive models). The type of multivariate studies of structural equation modeling (SEM) with a partial least squares (PLS) approach uses a structural model (inner model) for validation and reliability tests and a measurement model (outer model) for causality tests.

3. Results

3.1. Socio-demographic of Study Participants

Table 1 showed that the participants' religion was mostly Islam (83.5%), whereas the ethnicity of the majority of the participants was Javan (57.8%), followed by Batak (16.2%) and Malay (8.6%). Based on the age distribution, the majority of respondents and their husbands were 26–30 years old (36.8% and 33.6%, respectively). Both the respondents and their husbands mostly completed high school education (75.6% and 77.4%, respectively). The respondent's occupation was mostly housewives/not working (79.7%), and most husbands were self-employed (37.1%). Additionally, most of the husbands were smokers (64.1%).

Table 1. Socio-demography characteristics of participants (n=315)

No	Characteristics	N	(%)
1	Religion		
	– Islam	263	83.5
	– Christian	48	15.2
	– Catholics	4	1.3
2	Ethnicity		
	– Java	182	57.8
	– Batak	51	16.2
	– Malay	27	8.6
	– Karo	20	6.3
	– Mandailing	10	3.2
	– Others	25	7.9
3	Age		
	– < 20 years	7	2.2
	– 20 – 25 years	71	22.5
	– 26 – 30 years	116	36.8
	– 31 – 35 years	69	21.9
	– 36 – 40 years	39	12.4
	– > 40 years	13	4.2
4	Education		
	– Not completed primary school	2	0.6
	– Primary school	17	5.4
	– Junior high school	58	18.4
	– Senior high school	238	75.6
5	Occupation		
	– Housewives	251	79.7
	– Merchants	27	8.6
	– Private employees	13	4.1
	– Farmers	12	3.8
	– Others	12	3.8
6	Husband's education		
	– Not completed primary school	1	0.3
	– Primary school	18	5.7
	– Junior high school	52	16.5
	– Senior high school	244	77.4
7	Husband's age		
	– <20years	2	0.6
	– 20–25years	37	11.7
	– 26–30years	106	33.6
	– 31–35years	74	23.5
	– 36–40years	56	17.8
	– >40years	40	12.8
8	Husband's occupation		
	– Self-employed	117	37.1
	– Factory workers	88	27.9
	– Private Employees	28	8.9
	– Farmers	22	7.0
	– Drivers	16	5.1
	– Others	44	14.0
9	Husband's smoking habit		
	– Smoking	202	64.1
	– Nonsmoking	113	35.9

3.2. Study Variables

Table 2 shows the distribution of each characteristic in the study variables. Nutritional intake status of the respondents was moderate (35.9%), good (34.6%), and deficient (29.5%). More than half of the respondents ever used birth control (58.4%), and most respondents had a light workload (79.7%). The age of the respondents at the time of pregnancy was mostly not at risk (73.3%). Additionally, most respondents' birth spacing and parity were not at risk (86.4% and 57.7%, respectively).

One-third of the respondents had complete visits of ANC (4–7 times), and 31.5% had ANC more than eight times. Most respondents' childbirths were assisted by midwives/nurses (61.3%). Additionally, the place of childbirth was mostly at midwife clinics (45.7%) and hospitals (41.0%). The cost of childbirth was paid through national health insurance (58.7%), and maternity insurance (Jampersal) paid for 13.3% of childbirth, while 27.9% were self-paid. Our results showed that most husbands supported each variable characteristic. Most respondents felt husbands provided instrumental support (41.6%) and a lot of informational, emotional, and appreciation support (40.3%, 41.0%, and 46.7%, respectively). Half the respondents had high self-esteem, and only 17.1% had low self-esteem, whereas the confidence level of most respondents was moderate (43.8%). Respondents in our study felt mild anxiety (48.6%) and moderate emotional levels (41.9%). However, 53.7% of respondents reported having any complication symptoms during pregnancy.

3.3. Healthy Childbirth Model Based on Husband Support

All indicators in the study variables showed a loading factor value of more than 0.7, which indicated that the indicators in this study can measure the variables. Figure 1 shows the healthy childbirth model based on the husband's support. The model was tested based on the inner model (structural model), which includes the output of r-square, parameter coefficients, and t-statistics. The significance value between constructs, t-statistics, and p-values can be seen in the bootstrapping results with t-statistic > 1.96, p-value = 0.05, and positive beta coefficient (Table 3). Our study found a significant influence between the husband's support and the mother's behavior ($\beta = 0.202$, $t = 3.936$, and $p = 0.001$), between the husband's support and access to health services ($\beta = 0.132$, $t = 2.523$, and $p = 0.012$), and between the husband's support and the mother's psychology ($\beta = 0.254$, $t = 4.025$, and $p = 0.001$).

Table 2. Distribution frequency of variables and their characteristics (n=315)

No	Husband's support	n	(%)	Mother's behavior	n	%	Access to Healthcare	n	%	Mother's Psychology	n	%
1	Instrumental			Nutrient intake			ANC behavior			Self-esteem		
	- Not supportive	80	25.4	- Deficient	93	29.5	- Never	7	2.2	- Low	54	17.1
	- Supportive	104	33.0	- Moderate	113	35.9	- Incomplete	104	33.0	- Moderate	103	32.7
	- Very supportive	131	41.6	- Good	109	34.6	- Complete	105	33.3	- High	158	50.2
2	Informational			Use of birth control			Childbirth attendants			Confidence		
	- Not supportive	67	21.3	- Ever	184	58.4	- Midwife/ nurse	193	61.3	- Low	85	27.0
	- Supportive	121	38.4	- Never	131	41.6	- General practitioner	1	0.3	- Moderate	138	43.8
	- Very supportive	127	40.3				- Obstetrician specialist	121	38.4	- High	92	29.2
3	Emotional			Workload			Childbirth place			Anxiety		
	- Not supportive	79	25.1	- Light	251	79.7	- Midwife clinic	144	45.7	- Not experiencing	120	38.1
	- Supportive	107	34.0	- Moderate	41	13.0	- Hospital	129	41.0	- Low	153	48.6
	- Very supportive	129	41.0	- High	23	7.3	- Health center	40	12.7	- Moderate	42	13.2
4	Appreciation			Age of pregnancy			Childbirth funding			Emotional		
	- Not supportive	59	18.7	- At risk	84	26.7	- National insurance (BPJS)	185	58.7	- Low	53	16.8
	- Supportive	109	34.6	- Not at risk	231	73.3	- Self-paid	88	27.9	- Moderate	132	41.9
	- Very supportive	147	46.7				- Maternity insurance	42	13.3	- High	130	41.3
5				Birth Spacing								
				- At risk	43	13.6						
				- Not at risk	272	86.4						
6				Parity								
				- At risk	133	42.3						
				- Not at risk	182	57.7						

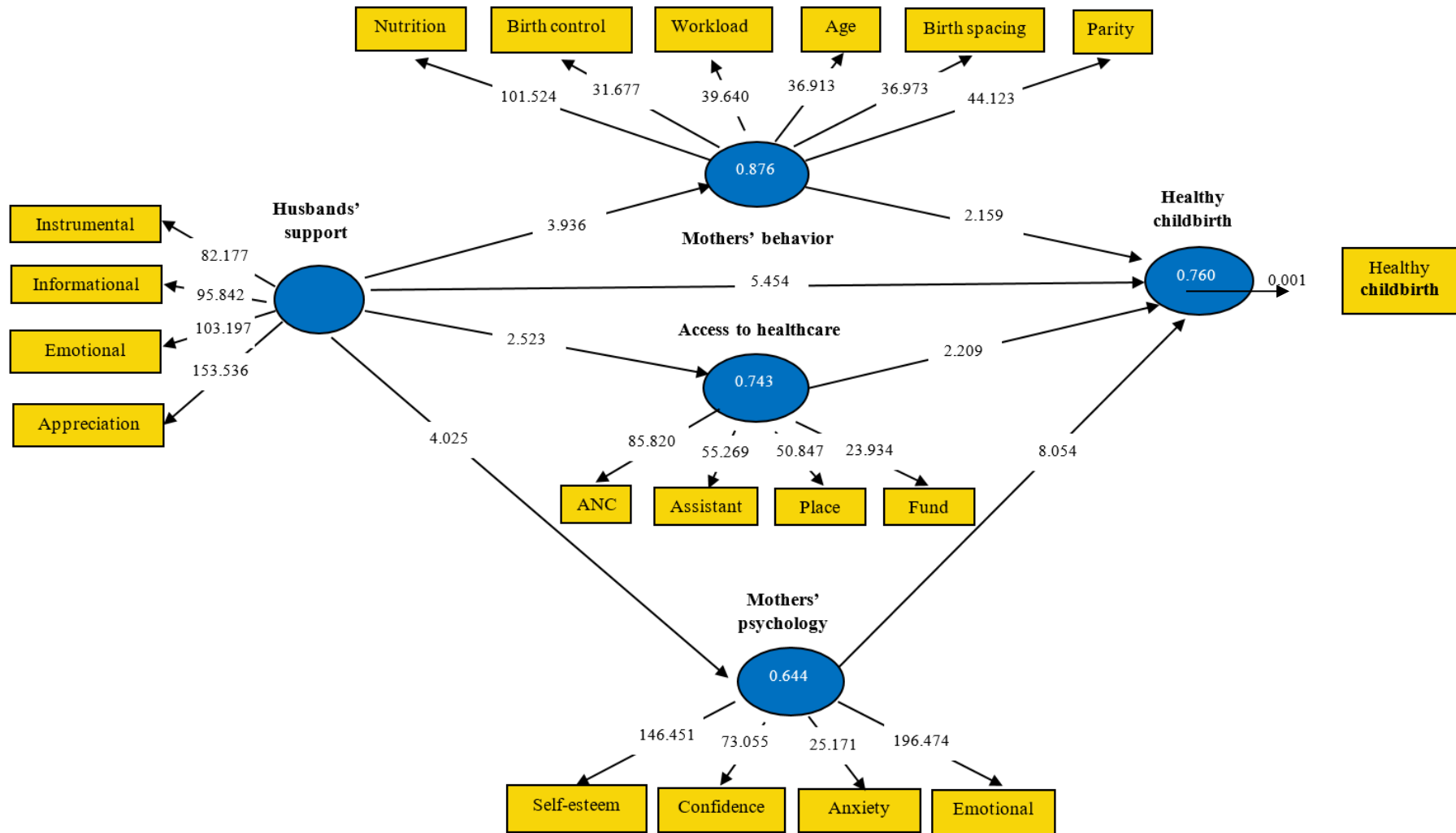


Figure 1. Path Analysis of Outer Model Relationships of Research Variable

Table 3. Model measurement of study variables

No	Variables	β	t value	p value
1	Husband's support → Mother's behavior	0.202	3.936	0.001*
2	Husband's support → Access to healthcare	0.132	2.523	0.012*
3	Husband's support → Mother's psychology	0.254	4.025	0.001*
4	Mother's behavior → Healthy childbirth	0.110	2.159	0.031*
5	Access to healthcare → Healthy childbirth	0.106	2.209	0.028*
6	Mother's psychology → Healthy childbirth	0.405	8.054	0.001*
7	Husband's support → Healthy childbirth	0.266	5.454	0.001*
8	Husband's support → Mother's behavior→Healthy childbirth	0.022	1.990	0.047*
9	Husband support → Access to healthcare→Healthy childbirth	0.014	1.804	0.072
10	Husband support → Mother's psychology→Healthy childbirth	0.103	3.683	0.001*

*: significant at the 0.05 level (2-tailed)

Significant direct effects among all variables, namely: husband's support ($\beta= 0.266$, $t= 5.454$, and the $p= 0.001$), mother's behavior ($\beta=0.110$, $t= 2.159$, and $p= 0.031$), access to health services ($\beta= 0.106$, $t= 2.209$, and $p= 0.028$), mother's psychology ($\beta= 0.405$, $t= 8.054$, and $p= 0.001$), and healthy childbirth were found. Additionally, significant indirect influences between the husband's support for healthy childbirth through the mother's behavior ($\beta= 0.022$, $t= 1.990$, and $p= 0.047$) and through the mother's psychology ($\beta= 0.103$, $t= 3.683$, and $p= 0.001$) were found in this study. However, there was no significant effect on the husband's support for healthy childbirth through access to health services ($\beta= 0.014$, $t= 1.804$, and $p= 0.072$). Our study found that the husband's support directly influenced healthy childbirths and also indirectly affected healthy childbirth through the mother's behavior and psychology. Additionally, the mother's behavior and psychology directly influenced healthy childbirth.

4. Discussion

Maternal death can occur during pregnancy, childbirth, and postpartum and in general, can be prevented. One of the preventions is through the husband's support. This study showed a positive influence between the husband's support for healthy childbirth, mother's behavior, and mother's psychology but did not show a significant influence between the husband's support and access to health services in the Deli Serdang Regency. Mothers who received their husbands' support during pregnancy had lower stress levels and increased healthy behaviors during pregnancy [14]. Additionally, the husband's support was not only in a form of financial fulfillment but also as a decision-maker when the mother gave birth [15]. The husband's support, such as instrumental support (providing money for examinations and childbirth, preparing vehicles at the time of childbirth, etc.), directly impacted healthy prenatal care and childbirth. The indirect effect of the

husband's support on healthy childbirth through the mother's behavior occurred through increased nutritional intake [14], use of birth control [16], light workload, not-at-risk age of pregnancy [17], not-at-risk birth spacing [18], and not-at-risk parity [19]. Material support from the husband increased the nutritional intake of the mother, whereas the husband's informational support (advice/suggestions) strengthened the wife's use of birth control, regulated healthy activity patterns, and influenced decisions regarding the age of pregnancy, birth spacing, and parity. Additionally, family planning, which can be seen from birth spacing, number of children, age of marriage, and nutrition consumed by the mother, was a supporting factor in reducing maternal mortality, as stated in an Indonesian study [20].

Husband's support indirectly influenced healthy childbirth through the mother's psychology by increasing the mother's self-esteem [21] and self-confidence [22], as well as reducing anxiety [23] and the emotional level [24]. This controlled psychological condition will increase the mother's readiness to face childbirth. Mothers often experienced psychological disturbances because they were worried about the impending childbirth. The husband's presence provided calmness and a companion (emotional support), as well as giving praise (appreciation support) improved the psychological condition and increased their readiness for childbirth.

Interestingly, despite the positive influence of husbands' support on healthy childbirths, MMR in the Deli Serdang Regency is still in the top position in North Sumatra [8], [9]. Even though husbands provided assistance and support to their wives, such as helping with household chores and taking them to health facilities for antenatal checks, providing education to husbands regarding maternal and child health is needed to anticipate pregnancy complications and utilize maternal health services by their partners [25] [26]. Another study conducted in Myanmar also showed similar results in which the majority of husbands supported their wives in the form of

accompanying them to health services and preparing for childbirth, yet the maternal mortality still reached 250 per 100,000 [27]. Maternal mortality in Indonesia in 2021 is 7.389 deaths, which is caused by several factors such as bleeding, hypertension in pregnancy, and other complications. Awareness of pregnancy complications, delays, and insensitivity of medical personnel to referral and treatment [29], and distance to health facilities are non-medical factors that can affect maternal mortality [30], [31], [32].

This study has some limitations. First, this study included only families who received family-hopeful assistance and mainly in rural areas, so the results obtained cannot be generalized to urban areas and various economic conditions. Second, the husband's knowledge of maternal and child health was not tested further. Therefore, the support provided by husbands tended to be general and not specific to the health of mothers and children.

5. Conclusions

The husband's support directly influenced healthy childbirth and indirectly influenced healthy childbirth through the mother's behavior and psychology. However, the husband's support did not significantly influence healthy childbirth through access to healthcare. A healthy childbirth model based on the husband's support could be used to increase maternal health and prevent maternal deaths in poor families.

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