



DETERMINANT OF NEONATAL VISIT COVERAGE RATE IN SERDANG BEDAGAI REGENCY NORTH SUMATRA INDONESIA

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ABSTRACT

Neonatal mortality is a leading cause of infant deaths, particularly in developing countries. In Serdang Bedagai Regency, the coverage of neonatal visits remains low, contributing to the high neonatal mortality rate and causing economic losses. This study aims to identify factors related to the neonatal visit coverage rate in Serdang Bedagai Regency, North Sumatra, Indonesia. This study used a cross-sectional design with multivariate analysis. Data were collected from 200 mothers with babies aged 0-28 days in five health centers in Serdang Bedagai Regency. The variables analyzed include age, education, economic status, knowledge, maternal attitudes, culture, family support, midwife attitudes, access to health facilities, and service quality. The data were analyzed using logistic regression. The results showed that the variables consistently and significantly affecting the increase in neonatal visit coverage were maternal education, knowledge about neonatal visits, local culture, husband/family support, and the quality of visit services. Factors that significantly contributed to increasing coverage of neonatal visits were maternal education (p-value = 0.004, OR = 14.285), maternal knowledge (p-value = 0.000, OR = 75.920), local culture (p-value = 0.000, OR = 57.105), husband/family support (p-value = 0.000, OR = 77.763), and service quality (p-value = 0.000, OR = 47.474). These factors have a major influence in supporting the success of the neonatal visit program, with maternal knowledge and family support being the most dominant factors. Efforts to increase coverage should involve educating mothers, involving families, and enhancing services while considering local wisdom.

Keywords: culture, knowledge, maternal education, neonatal visits, service quality

Introduction

Neonatal mortality remains a significant health concern globally, particularly in developing countries. The first 28 days of a newborn's life are critical, as infants are highly vulnerable to health complications that, if undetected or untreated, can result in death.¹ The WHO estimates that 75% of neonatal mortality occurs during the neonatal period, making neonatal healthcare quality improvement crucial. The 2022 North Sumatra Province Health Profile recorded the neonatal mortality rate at 2,3 per 1000 live births. Meanwhile, 2023 Serdang Bedagai District Health Profile data shows the neonatal mortality rate is 2,8 per 1000 live births. In Serdang Bedagai District, the primary causes of neonatal mortality include Low Birth Weight and Prematurity (11 cases), Asphyxia (6 cases), Congenital Abnormalities (1 case), and Other Causes (8 cases).²

Neonatal who do not undergo neonatal monitoring are at higher risk of undetected health issues such as infections, asphyxia, and other complications that can lead to death. In Indonesia, for example, high neonatal mortality rates are largely due to low coverage of neonatal visits, compounded by limited maternal awareness, lack of family support, and insufficient healthcare workers in remote areas. The long-term consequences of this situation are extensive, impacting economic, social, and health domains. Economically, the rising neonatal mortality and morbidity rates add to the financial burden of long-term care for families and the healthcare system. Socially, high mortality rates affect family well-being, cause psychological stress, and reduce parental productivity, as parents must care for children with preventable complications. From a health perspective, infants who do not receive neonatal visits are more vulnerable to long-term health problems, including recurrent infections and developmental delays, which may affect their quality of life into adulthood. Thus, low neonatal visit coverage is not only a short-term health issue but also impedes the development of a high-quality human resource base and has widespread impacts on society and the economy overall.^{3,4}

Neonatal visits are an important intervention in reducing neonatal mortality because they allow health workers to assess the growth of newborns and detect potential health problems early.⁵ This examination is crucial to ensure immediate intervention if indications of health problems are found. Unfortunately, coverage of neonatal visits in Indonesia, including in Serdang Bedagai Regency, is still low.⁶ Many mothers do not understand the importance of this examination or face various obstacles, such as difficult access to health facilities, lack of family support, and suboptimal service quality.⁷

Various social, economic and cultural factors influence a mother's decision to have a neonatal visit. Educational factors, economic status, knowledge, and family support play a significant role in shaping the health behavior of mothers and babies. Mothers with higher education and adequate family support tend to better understand the importance of neonatal examinations. On the other hand, mothers with limited knowledge or not supported by the family

are at risk of not having regular visits, which can increase the baby's vulnerability to health problems. In addition, cultural norms are also an important factor influencing maternal behavior regarding neonatal visits.⁸ Certain traditions or beliefs may hinder the utilization of health services during the neonatal period. Another obstacle is the accessibility of health services in remote areas, which are often difficult to reach due to lack of infrastructure.⁹

Suboptimal coverage of neonatal visits indicates serious gaps in the health system that can have fatal consequences. If not treated immediately, this can increase the mortality rate of neonatal significantly, which is certainly very worrying. Without better efforts to increase coverage of neonatal visits, many babies will remain at high risk, especially in remote areas that face various barriers such as difficult access to health facilities, lack of maternal knowledge, and minimal family support.¹⁰

This study aims to analyze the factors influencing the low coverage of neonatal visits in Serdang Bedagai District, to provide solutions for improving maternal awareness, access to healthcare services, and serving as a basis for effective policies to reduce neonatal mortality.^{11, 12}

Methods

This research employed quantitative methods with observational analysis using a cross-sectional research design. The population in the study were mothers who had neonates (babies aged 0-28 days) in Serdang Bedagai Regency. The sample size is 200 mothers who have newborns and live in the sub-districts of Dolok Merawan, Tebing Syahbandar, Kotarih, Naga Kesiangan, and Pon Village, taking into account that the coverage rate for neonatal visits in these sub-districts is the ² August 2023. The sample size was estimated using the Lemeshow formula to determine the proportion and population of the study. In a preliminary study, the prevalence of neonatal mortality rate in Serdang Bedagai Regency was reported to be 82%, taking into account ($Z = 1.96$ for $\alpha = 0.05$ and error = 10%), the calculation results obtained from 200 samples in this study.²

$$n = \frac{\{Z_{1-\alpha/2} \sqrt{2 \cdot P_2 (1-P_2)} + Z_{1-\beta} \sqrt{P_1 (1-P_1) + P_2 (1-P_2)}\}^2}{(P_1 - P_2)^2}$$

$$n = \frac{\{1,96 \sqrt{2 \cdot 0,82 \times 0,18} + 0,842 \sqrt{0,901 \times 0,099 + 0,82 \times 0,18}\}^2}{(0,901 - 0,82)^2} = 200$$

The respondents criteria were mothers who had neonates aged 0-28 days and lived in Dolok Merawan, Tebing Syahbandar, Kotarih, Naga Kesiangan, and Pon Villages in Serdang Bedagai Regency. Meanwhile, exclusion criteria include mothers who have neonatal complications, mothers who have impaired communication and cognitive function, and mothers who do not agree to participate in the study.

The research was carried out as follows: 1) Developing a questionnaire designed by the researcher after reviewing relevant literature, and 2) Validating the questionnaire in the early stages, where face validity was conducted to ensure that the questions could be easily understood. The

validity and reliability tests were conducted on 30 respondents. Based on the validity test, all items showed a correlation coefficient greater than the table correlation value (0.361), and the reliability test yielded a Cronbach's Alpha value greater than 0.6. Data was collected using a two-part questionnaire. The first part included questions/statements about age, education, economic status, knowledge, attitudes, culture, husband/family support, access to healthcare services, midwife attitudes, service delivery, and the quality of neonatal visits. The second part measured compliance with neonatal visits.

The variables in this study were measured using Guttman and Likert scales. Maternal age was categorized as "at risk" if <20 years or >35 years and "not at risk" if between 20–35 years. Education was classified as "low" if the mother had not completed high school and "high" if she had a diploma or higher degree. Economic status was assessed based on income, categorized as "not prosperous" if below the regional minimum wage and "prosperous" if equal to or above the regional minimum wage. Knowledge was measured using a 10-statement questionnaire and categorized as "good" if the score was $\geq 50\%$. Maternal attitudes and cultural factors were assessed using Likert scales and categorized as "positive" if the score was $\geq 50\%$. Family support was evaluated through 23 statements, categorized as "supportive" if the score was $\geq 50\%$. Access to healthcare facilities was categorized as "near" if the score was $> 50\%$. At the same time, the quality and coverage of neonatal visit services were assessed through questionnaires and observations, categorized as "up to standard" and "compliant" if the score was $\geq 50\%$. Midwife attitudes were also measured using a Guttman scale and categorized as "positive" if the score was $> 50\%$.

The Ethics Committee of the Faculty of Medicine, Andalas University approved this study with Approval Letter No. 44/UN.16.2/KEP-FK/2023. The researchers obtained verbal and written consent from all respondents before distributing the questionnaires. The collected data was carefully managed to maintain confidentiality and accuracy, and all research procedures were carried out following applicable ethical guidelines.

Data was processed using Microsoft Excel and the SPSS version 24 program. Descriptive statistics were used to describe the characteristics of respondents. The chi-square test is used to assess the relationship between the independent variable and the dependent variable. Multivariate analysis uses logistic regression to identify variables that significantly influence increasing coverage of neonatal visits. The significance level was set at a value of less than 0.05

Results

The following are the results of univariate analysis that serve to describe the distribution of the variables in this study, which can be seen in table 1.

Table 1. Respondents Characteristic and Factor of Neonatal Visit Coverage in Serdang Bedagai

Variable Category	Frequency (n=200)	Percentage (%)
Age		
Risk	105	52.5
No Risk	95	47.5
Education		
Low	108	54.0
High	92	46.0
Economic Status		
Prosperous	108	54.0
not prosperous	92	46.0
Knowledge		
Less	73	36.5
Good	127	63.5
Attitude		
Negative	102	51.0
Positive	98	49.0
Culture		
Negative	105	52.5
Positive	95	47.5
Husband's support /family		
Not very support	102	51.0
Support	98	49.0
Access to Health Service Facilities		
Far	107	53.5
Near	93	46.5
Midwife's Attitude		
Negative	96	48.0
Positive	104	52.0
Visiting Services		
Limited	108	54.0
Unlimited	92	46.0
Visiting Quality		
Not accordance	79	39.5
in accordance	121	60.5
Neonatal visit		
Obedient	104	52
Not Obey	96	48

The table 1 analysis highlights several key factors influencing neonatal health service utilization. A majority of mothers fall within the risk age category (52.5%), with low education levels (54%) and a slight economic advantage for those in prosperous households (54%). Good knowledge about neonatal health is evident in 63.5% of respondents, suggesting a positive influence on service use. However, attitudes remain mixed, as 51% hold negative views, and cultural barriers persist, with 52.5% influenced by negative cultural norms. Family or husband support is limited for 51% of mothers, potentially impacting motivation to seek care. Access to facilities poses a challenge, with 53.5% facing distance issues, though midwives' positive attitudes (52%) could improve service engagement. Visiting services are often limited (54%), but the quality of those visits is generally good (60.5%), fostering trust. In summary, improving neonatal visit coverage will require attention to education, family support, accessibility, and service quality to

encourage greater use of neonatal health services. The majority of respondents (52%) are compliant with neonatal visits, while 48% are not

Table 2. Factors Related to Compliance with Neonatal Visits

Variable Category	Neonatal Visit				Total		p-value	Odds Ratio (OR)	CI 95%																																																																																																																																																																																																																																																																																															
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Risky	64	61	41	39	105	100	0.012	2.146	1.219	3.778																																																																																																																																																																																																																																																																																														
No Risk	40	42.1	55	57.9	95	100					Education											Low	78	72.2	30	27.8	108	100	0.000	6.600	3.554	12.258	High	26	28.3	66	71.7	92	100	Economic Status											Not Prosperous	62	57.4	46	42.6	108	100	0.129	1.605	0.916	2.809	Prosperous	42	45.7	50	54.3	92	100	Knowledge											Not Enough	68	93.2	5	6.8	73	100	0.000	34.378	12.815	92.220	Good	36	28.3	91	71.7	127	100	Attitude											Negative	81	79.4	21	20.6	102	100	0.000	12.578	6.438	24.574	Positive	23	23.5	75	76.5	98	100	Culture											Negative	91	86.7	14	13.3	105	100	0.000	41.000	18.207	92.326	Positive	13	13.7	82	86.3	95	100	Husband's Support /Family											Not Very Supportive	73	71.6	29	28.4	102	100	0.000	5.440	2.970	9.966	Support	31	31.6	67	68.4	98	100	Access To Service Facilities											Far	80	74.8	27	25.2	107	100	0.000	8.519	4.504	16.110	Near	24	25.8	69	74.2	93	100	Midwife's Attitude											Negative	58	60.4	38	39.6	96	100	0.032	1.924	1.096	3.380	Positive	46	44.2	58	55.8	104	100	Visiting Services											Limited	66	61.1	42	38.9	108	100	0.008	2.233	1.266	3.938	Unlimited	38	41.3	54	58.7	92	100	Visiting Quality											Accordance	74	93.7	5	6.3	79	100	0.000	44.893	16.594	121.451	Not Accordance	30	24.8
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Positive	46	44.2	58	55.8	104	100					Visiting Services											Limited	66	61.1	42	38.9	108	100	0.008	2.233	1.266	3.938	Unlimited	38	41.3	54	58.7	92	100	Visiting Quality											Accordance	74	93.7	5	6.3	79	100	0.000	44.893	16.594	121.451	Not Accordance	30	24.8	91	75.2	121	100																																																																																																																																																																																																																																				
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Table 2 showed that most variables had a significant influence on the frequency of neonatal visits. Maternal age, education, knowledge, attitude, culture, family support, access to health facilities, midwife attitude, visit service, and visit quality were statistically significant with a p-value below 0.05. This means that these factors are important components in encouraging families to conduct neonatal visits. Parental education and knowledge about the importance of neonatal visits were significant in increasing the number of visits, as were positive attitudes from mothers, families, and midwives. Family support and a supportive culture are also strong drivers for the frequency of these visits. In addition, easy access to health facilities and good quality of care during neonatal visits were shown to play an important role in increasing family participation in visits. However, economic status did not show a statistically significant effect on the frequency of

neonatal visits, but was still considered in the multivariate analysis where the test p-value was <0.25.

In this study, multivariate analysis helps us identify the most dominant factors affecting neonatal visit coverage by considering the effect of each independent variable while controlling for all other variables, as shown in Table 3.

Table 3. Multivariate Modelling Analysis Factors Influencing the Improvement of Neonatal Visit Coverage Rate

Variabel	Modelling		
	B	Sig	Exp (B)
Education	2.659	.004	14.285
Knowledge	4.330	.000	75.920
Culture	4.045	.000	57.105
Husband/family support	4.354	.000	77.763
Quality of visit	3.860	.000	47.474

Table 3 shows that the education variable indicates that mothers with higher education levels are 14.285 times more likely to attend neonatal visits compared to mothers with lower education levels. This suggests that education plays an important role in increasing mothers' awareness of the benefits of neonatal visits. Additionally, knowledge is a very strong factor, where mothers with good knowledge are 75.920 times more likely to improve neonatal visit attendance.

Culture also has a significant influence, with a 57.105 times higher likelihood of increased neonatal visits in communities with cultural practices that support health. This emphasizes that local wisdom that promotes health is crucial in encouraging positive behaviors. Support from husbands or families is the most influential variable, increasing the likelihood by 77.763 times. This support includes emotional motivation, logistical assistance, and facilities that enable mothers to attend neonatal visits regularly. Finally, the quality of healthcare services also plays an important role, with an increased likelihood of 47.474 times.

Discussion

Education has been proven to be one of the most important factors in determining the frequency of neonatal visits. The OR value for the education variable is 14.285, indicating that mothers with higher education levels are more likely to attend neonatal visits. This aligns with the theory that individuals with better education typically have a deeper understanding of the importance of health and child care and are better able to access information about healthcare services. Interventions focusing on improving maternal education, particularly health education, can have a significant impact on increasing neonatal visit coverage.^{13, 14}

Culture also has a highly significant influence in this study, as evidenced by the OR value of 57.105. This indicates that cultural norms and practices within the community play a crucial role in decision-making regarding neonatal visits. In many communities, cultural beliefs and values can

influence health behaviors, including the willingness to access healthcare services. A culture that supports child health will encourage families to make more frequent neonatal visits. Therefore, interventions that are sensitive to local culture, as well as involving traditional or community leaders, are essential to improve neonatal visit coverage.¹⁵

Support from husbands and families proved to be highly significant in the modeling. The high OR value (77.763) indicates that family support, particularly from husbands, plays an essential role in increasing the frequency of neonatal visits. Family support can take the form of emotional, logistical, or financial encouragement, all of which are crucial to ensuring that mothers can access healthcare services for their babies. Intervention programs targeting increased husband involvement in maternal and child healthcare can yield significant results in improving neonatal visit rates.¹⁶

The quality of care during neonatal visits showed a highly significant influence in all models. The OR value of 47.474 indicates that the quality of care received during neonatal visits greatly affects families' decisions to make subsequent visits. This highlights the importance of health services that are friendly, effective, and responsive to the needs of mothers and babies. To increase the coverage of neonatal visits, improvements in the quality of healthcare services are needed, including enhancing the competence of midwives, providing better facilities, and offering more family-centered services.^{7,17}

Age appears to have little impact on neonatal visits and may not always be a primary determinant in decision-making. However, in policy interventions, it remains important to focus on specific age groups, such as adolescent mothers or older mothers, who may require additional support to ensure they can access healthcare services optimally.^{18, 7} Economic status does not statistically have a significant impact on neonatal visits. While there is a general assumption that economic status greatly influences access to healthcare services, these findings suggest that other factors, such as education, knowledge, and family support, may have a greater influence. This also indicates that access to neonatal healthcare services in the study area may be fairly equitable, making economic status not a major barrier.^{19, 20}

Maternal or family attitudes towards health and neonatal visits were also not significant in most models, despite positive attitudes theoretically being important in motivating health behaviour. These results indicate that while favourable attitudes remain relevant, this variable may not be strong enough on its own to influence the frequency of neonatal visits if not supported by other factors such as knowledge, culture, and family support.^{21, 22} Access to health facilities was not significant in all models, indicating that the availability of health facilities may not be a major barrier in this study area. This could mean that health facilities in the area are quite accessible to most families, so access is not a major determinant of the frequency of neonatal visits.²³

From this discussion, it appears that the factors that are highly significant in influencing the frequency of neonatal visits are education, knowledge, culture, family support, and quality of visits. Interventions that focus on improving maternal education, more effective health counseling, promotion of cultural norms that favor child health, increased family support, and improved quality of health services will be instrumental in increasing neonatal visit coverage.⁵ In contrast, age, economic status, attitudes, and access to health facilities were not shown to have a consistently significant effect, although they remain relevant in the broader context of health policy.^{24, 25}

This study has several limitations, such as the limited scope of the study area, which was confined to a few health centers in Serdang Bedagai Regency, making the findings potentially ungeneralizable. Additionally, the use of self-reported data poses the risk of information bias. Furthermore, external factors such as local policies and healthcare infrastructure were not thoroughly examined. However, the findings of this study have significant implications, including the need for education- and knowledge-based interventions to enhance maternal awareness, strengthening family support, particularly from husbands, culturally sensitive approaches involving community leaders, and improving the quality of healthcare services by ensuring family-friendly facilities and adequate competence of medical personnel. These findings can serve as a foundation for local governments in designing evidence-based policies to sustainably increase neonatal visit coverage.

Conclusion

Based on the results of this study, it can be concluded that the factors that have the most influence on increasing neonatal visit coverage rates are education, knowledge, culture, family support, and quality of health services. Health interventions that focus on improving maternal education and knowledge, engaging communities in promoting cultural norms that support neonatal health, and improving the quality of health services can significantly increase neonatal visit coverage. Although variables such as age, economic status, attitudes, and access to health facilities are also relevant, their influence is not as great as the other factors mentioned. Holistic and comprehensive efforts are needed to improve neonatal visit coverage and ultimately reduce neonatal morbidity and mortality.

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Conflict of Interest

No conflict interest

Reference

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