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Effectiveness of a Community-Based Intervention Model in Increasing Neonatal Visit Coverage

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ABSTRACT

Background: Low neonatal visit coverage remains a challenge in improving newborn health. Community-based interventions using the *Pondok Dalam* approach may provide a solution to enhance awareness and access to neonatal healthcare services.

Objective: This study aims to evaluate the effectiveness of the *Pondok Dalam* community-based intervention model in increasing neonatal visit coverage.

Methods: This study employed a quasi-experimental design with a pretest-posttest approach without a control group to assess the effectiveness of the community-based intervention. The sample consisted of 60 mothers with neonates aged 0-28 days residing in the working areas of five public health centers (puskesmas) in Serdang Bedagai Regency. Data were collected using questionnaires before and after the intervention and analyzed using the Paired Samples t-Test.

Results: The study results indicated a significant increase in knowledge scores ($p < 0.001$), attitudes ($p < 0.001$), cultural practices ($p < 0.001$), husband/family support ($p < 0.001$), and the quality of neonatal visit services ($p < 0.001$) following the *Pondok Dalam*-based intervention.

Conclusion: The *Pondok Dalam* community-based intervention model has proven to be effective in increasing neonatal visit coverage. Wider implementation in primary healthcare services is necessary to enhance the quality of neonatal care.

Keywords: *Intervention model, neonatal visits, maternal and child health, Pondok Dalam, program evaluation.*

1. INTRODUCTION

1.1 Background

Neonatal health is a crucial indicator in assessing the quality of maternal and child healthcare services. The neonatal period, which refers to the first 28 days of an infant's life, is highly vulnerable to various health complications, including infections, asphyxia, and prematurity[1]. According to WHO reports, more than 2.4 million infants die during the neonatal period each year, with the majority of deaths occurring in developing countries due to inadequate access to proper healthcare services[2]. The primary causes of neonatal mortality include prematurity, infections, and poorly managed birth complications[3]. Therefore, effective interventions to improve access to neonatal healthcare services are essential in reducing neonatal mortality rates[1][4].

In Indonesia, neonatal mortality remains a significant challenge within the healthcare system. According to data from the Ministry of Health of the Republic of Indonesia (2024), the neonatal mortality rate in Indonesia is approximately 12 per 1,000 live births. Despite the implementation of neonatal visit programs, coverage remains below the optimal target[5]. The key factors contributing to the low coverage of neonatal visits include maternal awareness, limited access to healthcare facilities, sociocultural influences, and inadequate family support for neonatal health[4]. The challenges in increasing neonatal visit coverage in Indonesia involve multiple dimensions. Socioeconomic factors, such as maternal education level, family economic status, and access to healthcare facilities, significantly influence the frequency of neonatal visits[6]. Studies indicate that mothers with higher education levels tend to have better awareness of the importance of neonatal visits and are more proactive in accessing healthcare services[7].

Furthermore, cultural factors also play a role in determining maternal behavior regarding neonatal healthcare visits. In several Indonesian communities, traditional beliefs still discourage mothers from taking their newborns to healthcare facilities immediately after birth[8]. The shortage of healthcare personnel in remote areas also poses a significant barrier to providing optimal neonatal care services. Community-based approaches have proven effective in raising awareness and increasing the utilization of neonatal healthcare services[9], [10]. Community-based intervention models help improve access to maternal and newborn healthcare services, particularly in areas with limited healthcare infrastructure. Various community-based intervention strategies implemented in different countries include health worker-led education, home visit programs by medical personnel, and community group-based health counseling[11].

In Indonesia, a community-based intervention model known as *Pondok Dalam* has been introduced as a strategy to increase neonatal visit coverage. This model integrates healthcare workers, *posyandu* (integrated health post) cadres, and local wisdom-based education to support mothers and families in improving the utilization of neonatal healthcare services. The *Pondok Dalam* model aims to enhance maternal knowledge about the importance of neonatal visits, change societal attitudes and behaviors regarding neonatal health, and increase family involvement in supporting newborn health[12].

This study was conducted in Serdang Bedagai Regency, North Sumatra, Indonesia, covering five public health center (*puskesmas*) areas: Dolok Merawan, Tebing Syahbandar, Kotarih, Naga Kesiangan, and Desa Pon. These five *puskesmas* were selected due to their suboptimal neonatal visit coverage and sociocultural characteristics that may influence the success of community-based interventions.

Research Objective

This study aims to evaluate the effectiveness of the *Pondok Dalam* intervention model in increasing neonatal visit coverage. The primary focus of this research is to assess the impact of the intervention model on improving knowledge, attitudes, cultural perspectives, family support, and the quality of neonatal healthcare services. It is expected that the findings of this study will contribute to the development of more effective healthcare policies to improve neonatal health in Indonesia.

2. METHODS

This study employed a quasi-experimental one-group pretest–posttest design with an intervention. In this design, a single group of subjects was measured before (pretest) and after (posttest) the intervention, without a separate control group. This type of pretest–posttest design is commonly used to evaluate the effectiveness of health intervention programs when randomization is not feasible[13]. By conducting baseline and follow-up measurements, changes in the dependent variables can be observed, which are presumed to be the effects of the given intervention. This pre-post intervention design provides a clearer causal direction than cross-sectional studies; however, it is classified as quasi-experimental due to the absence of full randomization[13].

2.1 Population and Sample

The population in this study consisted of mothers with newborns (neonates) in Serdang Bedagai Regency, North Sumatra, Indonesia, covering five public health center (*puskesmas*) areas: Dolok Merawan, Tebing Syahbandar, Kotarih, Naga Kesiangan, and Desa Pon, with an estimated total of approximately 200 mothers. The sample size was determined using the two-sample proportion test formula proposed by Lemeshow et al. (1990). It was assumed that there would be a 20% increase

in outcome proportion, from 50% in the pretest condition to 70% in the posttest after the intervention. Based on this assumption, with a 95% confidence level and 80% statistical power, the minimum required sample size was calculated to be approximately 60 participants. This sample size was deemed sufficient to detect a significant difference of 0.20 in proportion according to Lemeshow et al. (1990). A purposive sampling technique was used, whereby subjects were deliberately selected based on predetermined inclusion criteria. All selected respondents were mothers in the neonatal period who met the criteria (residing in the study location, willing to participate in the program, and having a stable neonatal condition). The use of purposive sampling in a pretest–posttest design like this is commonly applied to ensure that the subject characteristics align with the intervention objectives. However, as a consequence, the findings are primarily applicable to populations with characteristics similar to those of the study sample.

2.2 Intervention (Pondok Dalam Model)

The primary intervention in this study was the implementation of the *Pondok Dalam* model, a community-based neonatal health assistance program rooted in local wisdom. The *Pondok Dalam* model was designed to improve neonatal visit coverage (a minimum of three neonatal check-ups) through the active involvement of healthcare workers, families, and the community. The intervention components of *Pondok Dalam* included the following activities:

- Maternal and family education on the importance of neonatal visits. Healthcare workers provided counseling sessions for postpartum mothers and their family members regarding the benefits of routine neonatal check-ups, early warning signs of neonatal health complications, and appropriate neonatal care practices. This education aimed to enhance maternal knowledge and foster a positive family attitude toward neonatal healthcare services.
- Assistance by midwives and posyandu cadres through neonatal visits (referred to as *Pondok Dalam* visits). Each mother was closely monitored by village midwives and local posyandu cadres through periodic *Pondok Dalam* visits during the neonatal period. During each visit, healthcare workers assessed the baby's condition, identified early neonatal health issues, and provided counseling to mothers. This approach aligns with evidence that home-visit-based interventions significantly improve healthcare service coverage and newborn care practices in the community.
- Provision of locally adapted health information through the *Pondok Dalam* guidebook. Mothers and families were given the *Pondok Dalam* model book, which contained neonatal health materials presented in a way that incorporated local language, traditions, and beliefs. The information was structured to align with traditional values, making it more acceptable to mothers and families. This culturally sensitive approach is crucial, as traditional community practices can influence healthcare service utilization[14]. By integrating local values (such as traditional postpartum rituals), families were expected to be more motivated to follow neonatal visit recommendations without feeling conflicted with their cultural beliefs.
- Community activities involving husbands and other family members. The *Pondok Dalam* intervention also included sessions that engaged husbands and other family members (such as grandmothers or mothers-in-law) in neonatal health support. Group education and discussions were held for fathers to emphasize their role in supporting their wives and newborns—for instance, ensuring that mothers and babies attended all neonatal visits, addressing harmful cultural taboos, and providing emotional support. The inclusion of husbands in neonatal health programs is backed by empirical evidence showing that spousal support is associated with higher adherence to neonatal visit recommendations[14]. By making neonatal health a shared family responsibility, the home environment was expected to become more conducive to achieving complete neonatal visits.
- Pretest–posttest intervention procedure. The *Pondok Dalam* model was implemented throughout the neonatal period (the first 28 days postpartum). Before the intervention, all respondents completed a pretest questionnaire to assess their knowledge, attitudes, cultural beliefs, family support, and perceptions of service quality. The respondents then participated in the intervention activities described above (education, regular assistance, etc.). After the intervention period ended (by the end of the neonatal month), respondents completed the same posttest questionnaire. Each mother thus served as her own control, and changes in pretest-to-posttest scores across various variables were analyzed to evaluate the effects of the *Pondok Dalam* intervention.

The *Pondok Dalam* model, which integrates family and community-based approaches, is expected to improve neonatal visit coverage and service quality. Similar approaches have been proven effective in enhancing neonatal healthcare-seeking behaviors. For example, a postpartum family support program in India increased neonatal/postpartum outpatient visits by 27% compared to pre-intervention levels[15]. Additionally, various studies have demonstrated that community-based interventions (e.g., home visits by community health workers) significantly improve neonatal care practices and ultimately contribute to reducing neonatal mortality. Therefore, the implementation of the *Pondok Dalam* model is expected to enhance not only the quantity of neonatal visits but also the quality of services and overall neonatal health outcomes.

2.3 Measurement and Data Analysis

This study used a structured questionnaire to measure all research variables: maternal knowledge level, maternal attitudes, cultural beliefs related to neonatal care, family support, and the quality of neonatal visit services. The questionnaire was developed by the researchers based on literature reviews and relevant guidelines, and it was pretested for content validity and reliability before use. Each variable was measured using a set of questions or statements on a Likert scale, where higher scores reflected better conditions (e.g., higher knowledge, more positive attitudes, stronger support, and more satisfactory service quality). The use of questionnaire-based data collection is widely applied in neonatal health research and has been demonstrated to produce reliable and valid data. For reference, a survey study in China using a questionnaire to assess maternal knowledge and attitudes toward neonatal health obtained a Cronbach's alpha of approximately 0.80 and a Content Validity Index (CVI) of approximately 0.96, indicating high instrument reliability and validity[16]. This supports the use of questionnaire instruments to consistently measure abstract concepts such as knowledge, attitudes, and service quality perceptions.

Before analysis, normality tests were conducted on pretest and posttest data using the Kolmogorov–Smirnov test. The results showed that the data distribution for all variables was non-normal ($p < 0.05$). This finding aligns with similar studies where respondents' knowledge and attitude scores often do not follow a normal distribution. Therefore, non-parametric statistical methods were used for data analysis. Specifically, the Wilcoxon signed-rank test was applied to compare paired median/mean values between pretest and posttest within the same group. The Wilcoxon test was chosen as it is suitable for examining pretest–posttest differences in paired data that are not normally distributed. A significance level of alpha 0.05 (two-tailed) was set for statistical analysis. All data analyses were conducted using statistical software, with results presented in p-values and changes in median variable scores. This analytical approach allowed for a comprehensive evaluation of the effectiveness of the *Pondok Dalam* intervention, encompassing knowledge, cultural behavior, social support, and neonatal healthcare service quality.

3. RESULTS

3.1 Respondent Characteristics

The majority of mothers were aged 20–35 years, had a secondary education level, and had experienced more than one childbirth.

3.2 Comparison of Pretest and Posttest

The analysis results indicated a significant improvement in all measured variables following the *Pondok Dalam* intervention:

Table 1. Comparison of Pretest and Posttest Mean Scores

Variable	Pretest (Mean)	Posttest (Mean)	Difference	p-value
Knowledge	6,23	8,63	2,4	0,000
Attitude	25,57	35,08	9,51	0,000
Cultural Beliefs	3,32	4,40	1,08	0,000
Family Support	14,17	19,88	5,71	0,000
Service Quality	6,05	8,50	2,45	0,000

The results indicated statistically significant improvements ($p < 0.001$) in all five variables—knowledge, attitude, cultural beliefs, family support, and service quality—following the *Pondok Dalam* intervention. The greatest increase was observed in attitude (9.51 points), followed by family support (5.71 points), indicating a strong positive impact of the intervention in these areas.

These findings suggest that the *Pondok Dalam* model effectively enhances maternal awareness, cultural acceptance, and family engagement in neonatal healthcare.

4. Discussion

The findings of this study indicate that the *Pondok Dalam* intervention significantly increased neonatal visit coverage. There was a notable rise in the proportion of newborns receiving healthcare visits during the neonatal period after the intervention compared to pre-intervention conditions. This increase suggests the effectiveness of the *Pondok Dalam* model in encouraging mothers and families to utilize neonatal visit services as scheduled. Statistically, the difference between pretest and posttest scores showed a significant improvement (with p-value < 0.05, as per the statistical analysis in this study). These findings

align with the hypothesis that a community-based approach incorporating local wisdom can enhance access to and utilization of neonatal healthcare services. Mothers who were previously reluctant or lacked understanding of the importance of postnatal visits became more proactive after receiving education and support through the *Pondok Dalam* program. In other words, this intervention successfully facilitated behavioral changes at the individual and family levels, as reflected in the increased frequency of neonatal home visits. This aligns with the continuum of care concept, which emphasizes that maternal and neonatal health support should not cease after childbirth but should continue into the neonatal period to ensure optimal monitoring and care for newborns[17].

The positive outcomes of the *Pondok Dalam* program are consistent with previous studies that have implemented community-based interventions to improve neonatal healthcare services. For example, a quasi-experimental study conducted in rural Ethiopia reported that strengthening the link between healthcare facilities and communities through postnatal home visits by health workers significantly increased neonatal visit coverage. The study recorded a 23.5% rise in neonatal visit coverage after the intervention compared to control areas[18], confirming that community-based interventions effectively encourage new mothers to utilize postnatal care services. A similar study in Bangladesh found that home visits by health workers during the neonatal period not only improved essential newborn care practices but also contributed to a reduction in neonatal mortality.

Baqui et al. (2009) reported that infants who received health worker visits on the first or second day of life had a significantly lower risk of 28-day mortality compared to those who did not receive such visits. A home visit on the first day of life was associated with a 70% lower risk of neonatal death, while a visit on the second day reduced the risk by approximately 60%[19]. These findings align with randomized trials conducted in South Asia and Africa, which demonstrated that home-visit strategies effectively reduce neonatal mortality rates. A meta-analysis of multiple field trials estimated a 12% reduction in neonatal mortality with large-scale home visit interventions [19][20].

Additionally, the increased neonatal visit coverage observed in this study supports global health recommendations. WHO and UNICEF advocate for home visits during the first week of life as a key strategy to improve neonatal survival[21]. This recommendation is based on evidence suggesting that up to two-thirds of newborn deaths could be prevented through simple, community-based interventions that reach mothers and babies immediately after birth[22]. Thus, the findings of this study reinforce the scientific consensus that community-level interventions, whether through home visits by midwives/health workers, family health education, or traditional community engagement, consistently improve neonatal service coverage and quality. Such approaches have been successfully implemented across different contexts: in Africa through health extension workers[18] and in Asia through community health volunteers[23], both leading to improved neonatal health monitoring during the critical early days of life[24].

4.1 Implications of Study Findings

From a practical standpoint, the success of the *Pondok Dalam* intervention in increasing neonatal visit coverage has significant implications for maternal and child healthcare services. Increased coverage means that more newborns receive early and regular health check-ups, allowing potential health issues to be detected and addressed promptly. The direct implication is a reduced risk of delayed treatment for neonatal complications (e.g., infections or low birth weight), as babies are monitored during the crucial first 28 days of life. Previous research has shown that early postnatal contact is associated with reduced neonatal morbidity and mortality [23]. Therefore, the increased neonatal visit coverage observed in this study has the potential to contribute to overall improvements in infant health outcomes. Mothers and families participating in the *Pondok Dalam* program also received education on newborn care (e.g., exclusive breastfeeding, umbilical cord care, and recognizing neonatal danger signs), which improved their knowledge and caregiving skills. Consequently, the impact of this intervention extends beyond visit frequency; it also enhances home-based newborn care practices, representing a long-term investment in child health.

From a public health policy perspective, these findings are highly relevant for health program planning at both regional and national levels. Neonatal visit coverage in Indonesia remains lower than other maternal and child health interventions[23]. herefore, the *Pondok Dalam* model presents an innovative intervention strategy that can help achieve national targets for improving neonatal visit coverage. Integrating this program into the existing healthcare system (e.g., through *posyandu*, *puskesmas*, or midwife-led home visit programs) aligns with efforts to meet Minimum Service Standards in neonatal healthcareLocal health policies could adopt similar approaches while adapting to the cultural context of each region. For instance, involving community leaders or utilizing traditional ceremonies (such as Aqiqah celebrations in Muslim communities) as opportunities for newborn health education and service delivery[25], [26]. With policy support, initiatives like *Pondok Dalam* could be scaled up to broader regions, thereby making a more significant contribution to reducing neonatal mortality rates and advancing the Sustainable Development Goals (SDGs) related to child health. Overall, these findings underscore the importance of a collaborative approach between healthcare facilities and communities. Empowering families and communities, as demonstrated in the *Pondok Dalam* model, can serve as a key strategy to ensure that every newborn has access to postnatal healthcare services—ultimately enhancing overall public health[27].

4.2 Limitations and Recommendations

Although the findings of this study demonstrate the success of the *Pondok Dalam* model, several limitations should be acknowledged. One of the primary limitations is the lack of a control group, making it difficult to completely rule out the influence of external factors on the study results. Therefore, future research is recommended to employ an experimental design with a control group to further validate these findings.

Additionally, this study only measured the short-term impact of the intervention. Follow-up studies examining the long-term effects of the *Pondok Dalam* model would be highly valuable in assessing the sustainability of maternal and family behavioral changes regarding neonatal visits. Furthermore, qualitative research exploring the experiences of mothers, healthcare workers, and families in implementing this model could provide deeper insights into the factors influencing intervention effectiveness[18][28]. Lastly, certain cultural factors remain a challenge. For instance, some communities have traditional beliefs that restrict newborns from being taken outside the home before reaching a certain age. This cultural norm may hinder neonatal home visits unless properly anticipated by healthcare workers. Possible adaptations include midwives conducting home visits without requiring newborns to be brought to facilities or educating families that health check-ups do not violate traditional taboos[29][30].

With these findings, the *Pondok Dalam* model is expected to be further developed and adapted to diverse social and cultural contexts to improve neonatal visit coverage and ultimately reduce neonatal morbidity and mortality rates.

4. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The *Pondok Dalam* intervention model has proven effective in increasing neonatal visit coverage by improving maternal knowledge, attitudes, cultural acceptance, family support, and the quality of neonatal services. These findings suggest that community-based approaches can be an effective strategy for enhancing access to and quality of neonatal healthcare services, particularly in areas with limited healthcare facilities.

5.2 Recommendations

1. Expand the implementation of this model in primary healthcare services to reach a broader population.
2. Conduct longitudinal studies to evaluate the long-term impact of the intervention.
3. Develop more interactive educational modules to support community-based interventions.

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