



ANALYSIS OF CONGENITAL HYPOTHYROID SCREENING PROGRAM IN INDEPENDENT MIDWIFERY PRACTICES

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ABSTRACT

Congenital Hypothyroidism Skrining (CHS) is a national program aimed at the early detection of thyroid dysfunction in newborns to prevent growth and developmental delays. Permenkes (2014) In Tangerang City, the program coverage remains far below the national target, highlighting the need to examine the factors influencing its implementation (Kemenkes RI, 2023). This study aims to analyze the relationship between individual and systemic factors and the success of CHS, while also exploring the experiences of midwives in carrying out the program. This research employed a mixed methods design with an explanatory sequential approach. The qualitative phase was carried out through in-depth interviews with selected informants to gain a more comprehensive understanding of the dynamics of program implementation, namely the Health Office, Community Health Centers, BPM, and mothers of infants who underwent SHK in Tangerang City. Analysts used the NVivo application. The quantitative phase was followed by distributing questionnaires. The sample was taken using a purposive sampling method (inclusion and exclusion), resulting in 144 PMBs. Data analysis used descriptive and inferential statistics (chi-square test or logistic regression) using SPSS. Quantitative findings indicated that factors such as education, training, knowledge, attitudes, referral compliance, availability of equipment, reporting practices, and family support were not statistically associated with program success. However, socialization efforts showed a tendency toward stronger influence, though not yet statistically significant. Meanwhile, the qualitative phase generated six main themes reflecting the participants' perspectives and experiences, namely understanding of CHS, implementation processes, patient responses, strategies for socialization and education, challenges in implementation, and evaluation with expectations for improvement. The success of CHS is influenced by complex factors beyond individual midwife characteristics. Strengthening socialization strategies, enhancing cross-sector collaboration, and improving coordination among stakeholders are essential to expand coverage and improve program effectiveness.

Keywords: hypothyroid skrining (CHS); independent midwifery practice (IMP); tangerang city

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INTRODUCTION

Congenital hypothyroidism (CH) is a condition characterized by thyroid hormone deficiency at birth, leading to possible intellectual retardation and stunted growth if untreated. Early screening detects CH to initiate timely intervention, minimizing irreversible neurodevelopmental damage (Ahri & Batara, 2024; Hiola et al., 2022). Indonesia's national CHS program faces low coverage; in 2023, coverage was 20.7% nationally and 26.85% in Tangerang City (Kemenkes, 2024). As of November 2024, only 48.9% of infants have been screened for SHK, from the total target of 90%. (Dinas Kesehatan Kota Tangerang, 2025). The complexity of factors affecting program success, particularly in midwifery independent practices (Praktek Mandiri Bidan - PMB), necessitates comprehensive analysis to guide improvements (Kemenkes RI, 2023) The purpose of this study is to analyze the implementation of the Congenital Hypothyroidism Screening (SHK) program in midwife private practices.

METHOD

This research employed an exploratory sequential mixed methods design. This research was conducted from April 1 to June 30, 2025. The qualitative phase involved interviews with 19 informants including health officials, Puskesmas staff, independent midwives, and mothers. Themes from qualitative analysis guided the construction of a quantitative questionnaire. The quantitative phase surveyed 144 IMWs in Tangerang area, using validated and reliable instruments measuring variables such as education, training, knowledge, attitude, referral compliance, tool availability, socialization, documentation, and program success. Data analyzed using chi-square tests and multiple logistic regression.

RESULT

Qualitative Findings (NVivo Analysis), Six themes emerged:

1. Understanding of CHS

Healthcare providers, including officials from the health office, community health centers, and MIPs, demonstrate a solid understanding of the purpose and benefits of CHS as a method of early detection for thyroid disorders in newborns. However, parental knowledge remains limited and unevenly distributed, with many parents aware only of the blood sampling procedure but not the full scope of its purpose and benefits. The predominant sources of information for parents are midwives and healthcare personnel at health facilities (Soekmasari et al., 2024).

The results of this study are consistent with the research by Putri et al. (2023), which states that the success of neonatal screening programs is largely determined by the understanding and competence of health workers in conveying information to the community. This research has been conducted through ethical consideration. Registration number: KEPK/UMP/369/III/2025. There was no conflict of interest that might influence the results or interpretation of the result.

2. Implementation Process

The technical procedures for CHS adhere to established Standard Operating Procedures (SOPs), including heel blood sampling of newborns aged between 48-72 hours, which can commence as early as 24 hours under special circumstances. Coordination between the facilities is facilitated by WhatsApp groups and network meetings, although specimen delivery sometimes faces delays due to limited delivery schedules. Specimen handling follows a tiered management system from MIPs and community health centers to the health office and onward to referral laboratories (Soekmasari et al., 2024). The Indonesian Ministry of Health (2020) emphasizes that screening results must be reported in a timely manner to enable immediate detection and treatment, given that thyroid dysfunction can have long-term effects on child growth and development. According to the WHO, (2018) neonatal screening systems must be supported by integrated, rapid, and responsive services. If there are obstacles in any stage, such as delays in delivery or reporting of results, the effectiveness of early detection will be compromised, and the risk of complications in infants will increase. Therefore, it is important to establish a solid coordination and logistics system among various levels of service.

3. Family Response and Attitudes

Emotional reactions among families vary, encompassing anxiety, fear, and reluctance concerning blood sampling of their infants. Nevertheless, most families agree to proceed upon receiving proper explanations from midwives. Additionally, families generally accept the screening results, including referral procedures if abnormalities are detected (Soekmasari et al., 2024). This is reinforced by research from Sulistyani et al. (2024) which states that the success of neonatal screening programs is largely determined by the attitudes and beliefs of parents, particularly in accepting medical procedures on newborns. Therefore, active family involvement in the education and risk communication process is essential to increase acceptance of this program.

4. Socialization and Education Strategies

CHS educational activities are conducted through antenatal classes, integrated health posts (posyandu), direct communication by midwives, as well as via social media and digital platforms. The community expresses a preference for more structured, interactive education formats delivered through accessible media such as TikTok and Instagram (Soekmasari et al., 2024). This is in agreement with research by Sulistyani et al. (2024) which proves that the use of Android-based educational applications helps pregnant women understand the benefits of SHK independently.

5. Challenges in Implementation

The program faces multiple challenges, including technical, logistical, and human resource constraints. These include delays in specimen delivery and result reporting, shortage of equipment and facilities, lack of structured training for midwives in MIPs, and partial community resistance or misunderstanding toward the program (Soekmasari et al., 2024). Theoretically, these implementation challenges are consistent with the Program Implementation Theory framework (Etemadi et al., 2021), which emphasizes that the success of a health intervention is largely determined by three main components: support systems (logistics, regulations, infrastructure), implementer capacity (workforce competence and training), and community response and engagement. An imbalance in any of these aspects can reduce the overall effectiveness of the program.

6. Evaluation and Recommendations

Despite improving service coverage, gaps persist in equitable distribution, reporting system robustness, and government support. It is anticipated that MIP midwives will become more active and properly trained to conduct CHS autonomously. The development of continuous training programs, equitable equipment provision, enhanced coordination amongst health services, and better education for parents from pregnancy onward are essential to sustain and expand the program's purpose (Soekmasari et al., 2024). Theoretically, health program evaluation is closely related to the principles of health program evaluation, which emphasize three main indicators: input, process, and output (Cankaya et al., 2021).

Quantitative Findings (SPSS Statistical Analysis)

Tabel 1

Distribusi of education, training, knowledge, attitude, compliance with referrals, availability of equipment, program socialization, recording and reporting, as well as perceptions of the success of the CHS program.

Variabel	Kategori	F	%
Education	≤ D3	55	38,2
	> D3	89	61,8
Training	Never	88	61,1
	Trained	56	38,9
Ability of Equipment	Not Available	102	70,8
	Available	42	29,2
Referral Compliance	Not Referring	25	17,4
	Referring	119	82,6
Program Socialization	No Socialization	53	36,8
	Socialization	91	63,2
Recording and Reporting	No Recording	71	49,3
	With Recording	73	50,7
Knowledge	Poor	4	2,8
	Good	140	97,2
Attitude	Negative	70	48,6
	Positive	74	51,4
CHS Program	Unsuccessful	85	59
	Successful	59	41

Data source: SPSS v.27 output, analyzed by the author(s) (2025)

Most midwives hold an educational qualification above Diploma 3 (61.8%) and possess good CHS knowledge (97.2%). However, a majority have never attended CHS training (61.1%). Moreover, 70.8% of MIPs lack CHS equipment, though 82.6% have performed referrals. Program socialization activities were conducted by 63.2% of midwives, with 50.7% engaging in documentation and reporting (Soekmasari et al., 2024). This is in accordance with regulations in Law No. 4 of 2019 concerning Midwifery. With the government regulation that independent midwives must at least complete the professional level to be able to continue their practice, this resulted in many midwives returning to school when this study was conducted. This regulation is very good for improving the competence of midwives (Kemenkes, 2019).

Table 2

The correlation between education, training, knowledge, attitude, referral compliance, availability of equipment, program socialization practices, recording-reporting, and the success of the CHS program

Variabel	CHS Program					P Value	OR 95%CI
	Unsuccessful		Successful		Total		
	N	%	N	%			
Education							
≤ D3	31	56.4	24	43.6	55	100	0.736 0,837 (0,423–1,656)
> D3	54	60.7	35	39.3	89	100	
Training							
Never	55	62.5	33	37.5	88	100	0.374 1.444 (0.732-2.850)
Trained	30	53.6	26	46.4	56	100	
Ability of Equipment							
Not Available	62	60.8	40	39.2	102	100	0.630 1,280 (0,619–2,647)
Available	23	54.8	19	45.2	42	100	
Referral Compliance							
Not Referring	16	64	9	36	25	100	0.740 1,288 (0,527–3,150)
Referring	69	58	50	42	119	100	
Program Socialization							
No Socialization	36	67.9	17	32.1	53	100	0.139 1,815 (0,893–3,688)
Socialization	49	53.8	42	46.2	91	100	
Recording and Reporting							
No Recording	42	59.2	29	40.8	71	100	1.000 1,010 (0,520–1,963)
With Recording	43	58.9	30	41.1	73	100	
Knowledge							
Poor	2	50	2	50	4	100	1.000 0,687 (0,094–5,018)
Good	83	59.3	57	40.7	140	100	
Attitude							
Negative	44	62.9	26	37.1	70	100	0,460 1,362 (0,699–2,654)
Positive	41	55.4	33	44.6	74	100	

Data source: SPSS v.27 output, analyzed by the author(s) (2025)

Correlation Between Variables and the success of the CHS program: No significant relationships were identified between midwife education, training, equipment availability, referral adherence, socialization, documentation/reporting, knowledge, or attitudes and the success of CHS implementation ($p > 0.05$). Socialization exhibited the highest odds ratio (2.088), indicating a positive, albeit statistically non-significant, impact on program success (Soekmasari 2025). This is not in accordance with research by Retnosari et al. (2025) showing that health education and training have a significant effect on improving midwives' knowledge and attitudes towards SHK, which ultimately makes program implementation more effective. Similarly, research by Siti et al. (2025) which states that the support of health workers is one of the dominant factors in the success of SHK. (Siti Rochmah, Istiana Kusumastuti, 2025)

Even though midwives referred patients according to SOPs, babies did not arrive at health centers. According to the Health Belief Model theory (Rosenstock et al., 1988), public awareness and understanding of the importance of a health program is influenced by intensive and continuous socialization by health workers and related institutions. Permenkes No. 78 of 2014 and WHO guidelines emphasize that socialization and education for the community and health workers are an integral part of encouraging increased screening coverage and compliance and also emphasize accurate reporting and recording as a key requirement to ensure that detected infants receive follow-up (Permenkes, 2014).

Multivariate analysis was performed using multiple logistic regression to determine the most influential independent variables on the success of the congenital hypothyroidism screening program (SHK) after controlling for all variables. The variables included in the model were midwife education, CHS training, availability of CHS equipment, referral compliance, CHS socialization, recording and reporting, knowledge, and attitude.

Tabel 3
Data source: SPSS v.27 output, analyzed by the author(s) (2025)

Variabel	CHS Program				Total T	P Value	OR 95%CI
	Unsuccessful		Successful				
	N	%	N	%			
Education							
≤ D3	31	56.4	24	43.6	55	100	0.736 0,837 (0,423–1,656)
> D3	54	60.7	35	39.3	89	100	
Training							
Never	55	62.5	33	37.5	88	100	0.374 1.444 (0.732-2.850)
Trained	30	53.6	26	46.4	56	100	
Ability of Equipment							
Not Available	62	60.8	40	39.2	102	100	0.630 1,280 (0,619–2,647)
Available	23	54.8	19	45.2	42	100	
Referral Compliance							
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Program Socialization							
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With Recording	43	58.9	30	41.1	73	100	
Knowledge							
Poor	2	50	2	50	4	100	1.000 0,687 (0,094–5,018)
Good	83	59.3	57	40.7	140	100	
Attitude							
Negative	44	62.9	26	37.1	70	100	0.460 1,362 (0,699–2,654)
Positive	41	55.4	33	44.6	74	100	

Logistic Regression Model

The logistic regression model was not simultaneously significant ($p = 0.618$) and had a low explanatory power (Nagelkerke $R^2 = 5.7\%$), suggesting that other unmeasured factors substantially influence the program's success (Soekmasari et al., 2024). Statistical tests showed no significant association ($p > 0.05$) between education, training, knowledge, attitude, referral, tool availability, socialization, documentation and CHS success. Logistic regression indicated socialization had the highest odds ratio (2.088). This indicates that midwives who conducted socialization were twice as likely to succeed in the program compared to those who did not conduct socialization, although this result was not statistically significant.

Therefore, triangulation between the results of this study, theory, and previous studies shows that socialization and compliance factors remain important aspects that need to be considered, even though they have not been statistically proven to be significant in this study. Overall, the model explained only 5.7% of the variance in CHS success, indicating other external factors influence program outcomes.

DISCUSSION

The mixed findings highlight that despite good knowledge and positive attitudes among midwives, successful CHS implementation depends on broader systemic support including sufficient training coverage, adequate logistical support, and effective communication strategies (Kemenkes 2022). This is not in accordance with research of (Hiola et al. 2022) on logistical factors and family approval factors that influence the success of SHK implementation. Strengthened coordination across health facilities and enhanced education for families are essential to optimize early detection and intervention.(Indah Lugita Sari, Istiana Kusumastuti, 2024) (Radhia et al. 2023)

The lack of statistically significant correlations in quantitative data may indicate limitations in current program implementation frameworks or insufficient sample size/power. Emphasizing quality assurance, ongoing capacity-building, and community engagement, as underscored by Green's health promotion model and Health Belief Model, may advance CHS goals. (Green et al. 2021). The results of this study are in line with the findings of Soeripto (2019) which explain that in the maternal and child health care system, referral compliance and communication factors are still often not optimal. Although referral compliance was not significant in this study, the relatively lower significance value compared to other variables still indicates a potential influence.

Therefore, the multivariate results indicate that although the model used is considered fit, there are no independent variables that have a significant effect either simultaneously or partially. The low Nagelkerke R^2 value confirms that the success of the SHK program at PMB Kota Tangerang is likely influenced by factors outside the scope of this study, such as the quality of supervision, local policy support, or organizational commitment to supporting health programs.

CONCLUSION

The success of CHS implementation in Tangerang is influenced by complex, multifaceted factors beyond individual midwife characteristics such as education, knowledge, attitude, training, equipment, socialization, and record-keeping. Socialization shows promising potential for enhancing program effectiveness but requires improved implementation. Logistical constraints, training deficits, coordination issues, and community acceptance remain primary barriers. Efforts must focus on sustained training for midwives, equitable resource distribution, improved health service communication, and comprehensive parental education starting in pregnancy.

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