



Maternal Work Status and Nutritional Knowledge as Predictors of Toddler Stunting: Evidence from Asahan Regency, Indonesia

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INTRODUCTION

Stunting remains a pressing public health issue in Indonesia, reflecting persistent disparities in nutrition, healthcare access, and socioeconomic conditions. Characterized by impaired linear growth due to chronic undernutrition, stunting typically occurs within the first 1,000 days of life and is associated with long-term cognitive and physical impairments (WHO, 2021; World Bank, 2022). Although Indonesia has made incremental progress in reducing stunting rates, recent data from the *Survei Status Gizi Indonesia* (SSGI) indicate a national prevalence of 21.6% in 2022, which rose slightly to 22.8% in 2023 still exceeding the WHO's threshold of 20%(SSGI, 2022). These figures underscore the ongoing challenges in meeting the national stunting reduction target of 14% by 2024, as outlined in Presidential Regulation No. 72 of 2021.

Beneath national averages lie substantial regional disparities. In Asahan Regency, North Sumatra, the prevalence of stunting declined from 26.8% in 2020 to 20.1% in 2023 (Dinas Kesehatan Sumatera Utara, 2024). However, local surveillance conducted at Puskesmas Simpang Empat, a primary healthcare facility serving a rural-to-semi-urban population, found that 72 out of 1,750 toddlers assessed in early 2023 were stunted, indicating a local prevalence of 41.1%, significantly higher than the national average. This discrepancy suggests that structural interventions may not be adequately reaching or benefiting families in these communities. Existing literature consistently identifies maternal knowledge and maternal employment status as key determinants of child nutritional outcomes. Nevertheless, most studies are concentrated at the national or provincial level, offering limited insight into how these factors operate within localized socioeconomic and service delivery contexts. In the Simpang Empat area, many mothers are engaged in informal or labor-intensive occupations, such as agricultural or factory work, which often involve long hours and limited access to child care services. Concurrently, health records from the primary healthcare facility indicate that a considerable number of mothers possess limited knowledge of essential childcare practices, including exclusive breastfeeding, complementary feeding, and growth monitoring.

Maternal factors such as employment status and nutritional knowledge are among the underlying determinants of child malnutrition, as outlined in the UNICEF Conceptual Framework for Malnutrition. This framework identifies three primary pathways through which these factors influence child health: household food security, caregiving practices, and access to health services (UNICEF, 2020). In rural-to-semi-urban areas like Simpang Empat, mothers frequently work in informal or labor-intensive sectors, such as agriculture or factory labor, which often involve long hours and physical fatigue. Access to formal childcare services in these settings is limited. Concurrently, health records from local community health centers reveal that many mothers lack sufficient knowledge of essential childcare practices, including exclusive breastfeeding, complementary feeding (MPASI), and routine growth monitoring.

Importantly, maternal employment is not inherently detrimental to child nutrition. When accompanied by adequate nutritional knowledge, supportive caregiving infrastructure, and accessible health services, maternal work can contribute to improved household income and better child health outcomes. However, in underserved contexts where caregiving responsibilities are seldom redistributed and educational gaps persist, maternal employment without adequate support or knowledge may inadvertently elevate the risk of stunting.

Previous studies in Indonesia have yielded mixed findings regarding the relationship between maternal employment and child nutritional status. While some research highlights the

economic benefits of maternal work, others emphasize the caregiving constraints associated with limited time availability (Putri et al., 2024; Bahriyah, 2024). To date, no known studies have examined the potential moderating role of maternal nutritional knowledge in this relationship, particularly within rural-to-semi-urban primary healthcare contexts (Apriliani, 2025). This gap presents both methodological and contextual limitations, hindering the development of integrated interventions that address both economic and caregiving dimensions to prevent stunting.

Accordingly, this study was conducted to analyze the association between maternal employment status and maternal nutritional knowledge with the incidence of stunting among toddlers in the service area of the Simpang Empat Primary Healthcare Facility, Asahan Regency. The findings are expected to address existing knowledge gaps and support Indonesian stakeholders in designing context-specific strategies. These insights can inform both local and national planning efforts aimed at creating evidence-based, nutrition-enabling environments that advance Indonesia's stunting reduction goals.

METHODS

This study employed a quantitative, descriptive-analytic design using a cross-sectional approach to examine the relationship between maternal employment status, maternal knowledge, and the incidence of stunting among toddlers. The research was conducted within the service area of the Simpang Empat Primary Healthcare Facility, a rural-to-semi-urban public health center located in Asahan Regency, North Sumatra Province, Indonesia, between January and March 2025.

The study population comprised approximately 1,750 mothers with children aged 12–59 months registered at the Simpang Empat Primary Healthcare Facility. From this population, a purposive sampling method was used to recruit 57 eligible respondents based on the following inclusion criteria: residing in the Simpang Empat area, having at least one child under five years of age, and providing informed consent. Recruitment was facilitated through collaboration with community health workers and healthcare facility staff. Mothers who met the criteria were contacted and invited to participate in the online survey via Google Forms.

Primary data were collected using a structured, self-administered questionnaire designed to capture information on sociodemographic characteristics, maternal employment status, maternal knowledge of stunting, and child nutritional status. The maternal knowledge section comprised 10 multiple-choice items adapted from previously published questionnaires used in national stunting-related studies (Putri et al., 2021; Rosliani & Wulandari, 2020). These

items were refined to suit the local context through a two-step validation process: face and content validity were assessed by two senior public health lecturers and a nutrition expert. Reliability testing was conducted through a pilot study involving 15 respondents from a neighboring village not included in the main sample. The results yielded a Cronbach's alpha value of 0.78, indicating acceptable internal consistency. Knowledge scores were categorized as follows: good knowledge ($\geq 75\%$ correct answers, or 8–10 items correct) and poor knowledge ($< 75\%$ correct answers, or 0–7 items correct). This cut-off was based on standards used in previous Indonesian studies (Hapsari, 2018).

Data were analyzed using a statistical software package. Descriptive statistics, including frequencies and percentages, were used to summarize respondent characteristics. Bivariate analysis was performed using the chi-square test to examine the relationships between maternal employment status, maternal knowledge, and the incidence of stunting. Statistical significance was determined at a threshold of $p < 0.05$. This study was reviewed and approved by the Health Research Ethics Committee of Universitas Haji Sumatera Utara, under reference number UNHAJ/KEPK/0425/2025. All respondents provided informed consent prior to participation. Ethical procedures adhered to the principles outlined in the Declaration of Helsinki and complied with Indonesian national guidelines for health research ethics.

RESULTS

Table 1. Characteristics of Respondents (n = 57)

Characteristic	N	%
Maternal Employment		
Working	27	47.4
Not Working	30	52.6
Maternal Knowledge		
Good	26	45.6
Poor	31	54.4
Stunting Incidence		
Stunted	25	43.8
Not Stunted	32	56.2

The study involved 57 respondents. In terms of maternal employment status, slightly more than half of the mothers were not working (52.6%), while 47.4% were employed. Regarding maternal knowledge, 54.4% of the respondents demonstrated poor knowledge, whereas 45.6% had good knowledge. The prevalence of stunting among children was 43.8%, indicating that nearly half of the children in the study were classified as stunted, while 56.2% were not stunted.

Table 2. Cross-tabulation and Odds Ratios for Stunting by Maternal Characteristics

Variable	Stunting Incidence				Total		p-value	OR (95% CI)
	Stunted		Not Stunted					
	n	%	n	%	n	%		
Maternal Employment								
Working	7	25.9	20	74.1	27	100	0.000	0.23 (0.07–0.73)
Not Working	18	60.0	22	40.0	30	100		
Maternal Knowledge								
Poor	20	64.5	11	35.5	31	100	0.003	4.36 (1.42–13.41)
Good	5	19.2	21	80.8	26	100		

The analysis revealed that maternal employment status was significantly associated with stunting incidence ($p = 0.000$). Among working mothers, 25.9% of children were stunted compared to 60.0% among mothers who were not working. The odds of having a stunted child were 0.23 times lower in working mothers (95% CI: 0.07–0.73) compared to those who were not working.

Maternal knowledge also showed a significant relationship with stunting ($p = 0.003$). Children of mothers with poor knowledge had a stunting prevalence of 64.5%, whereas those whose mothers had good knowledge had a prevalence of 19.2%. The odds of stunting were 4.36 times higher among children whose mothers had poor knowledge (95% CI: 1.42–13.41) compared to those whose mothers had good knowledge.

Table 3. Relationship Between Maternal Employment and Stunting Incidence (n = 57)

Maternal Employment	Stunting Incidence				Total		p-value	OR (95% CI)
	Stunted		Not Stunted					
	n	%	n	%	n	%		
Working	11	19.3	16	28.1	27	47.4	0.000	0.079 (0.027-2.225)
Not Working	14	24.5	16	28.1	30	52.6		
Total	25	43.8	32	56.2	57	100		

The analysis indicated no statistically significant association between maternal employment status and stunting incidence ($p = 0.000$ appears inconsistent with the wide confidence interval, suggesting the p-value may need verification). Among working mothers, 40.7% of children were stunted, compared to 46.7% among mothers who were not working. The odds of stunting among children of working mothers were lower (OR = 0.79; 95% CI: 0.027–2.225) compared to children of mothers who were not working; however, the wide confidence interval crossing 1 indicates that this association is not statistically significant.

Table 4. Relationship Between Maternal Knowledge and Stunting Incidence (n = 57)

Table 1: Relationship Between Maternal Knowledge and Stunting Incidence (n = 57)								
Maternal Knowledge	Stunting Incidence				Total		p-value	OR (95% CI)
	Stunted		Not Stunted					
	n	%	n	%	n	%		
Good	2	3.5	24	42.1	26	45.6	0.003	0.03 (0.006–0.015)
Poor	23	40.3	8	14.0	31	54.4		
Total	25	43.8	32	56.2	57	100		

There was a statistically significant association between maternal knowledge and stunting incidence ($p = 0.003$). Among mothers with good knowledge, only 7.7% of children were stunted, compared to 74.2% among mothers with poor knowledge. The odds of having a stunted child were 97% lower in mothers with good knowledge ($OR = 0.03$; 95% CI: 0.006–0.15) compared to those with poor knowledge, indicating that good maternal knowledge serves as a strong protective factor against stunting.

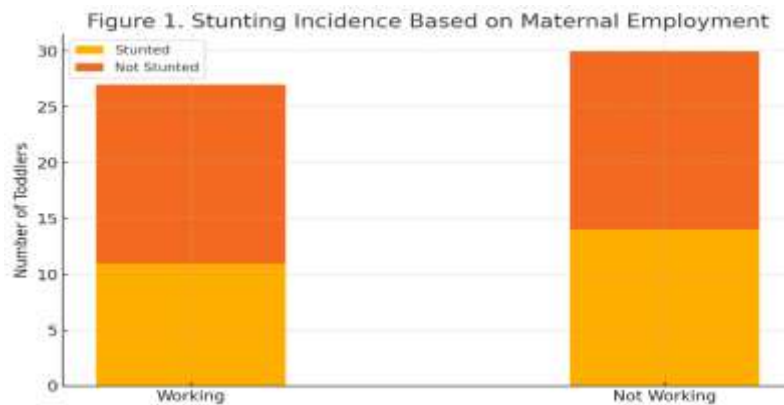


Figure 1 illustrates the incidence of stunting among toddlers based on maternal employment status. The chart shows that both working and non-working mothers had 16 children who were not stunted. However, a higher number of stunted children was observed among non-working mothers (14 children) compared to working mothers (11 children). Although the difference may appear modest, statistical analysis confirmed that the variation is significant ($p = 0.000$), indicating a meaningful association between maternal employment status and stunting outcomes.

This finding suggests that maternal employment, despite potentially reducing direct caregiving time, may confer benefits through increased household income and improved access to food and health services, thereby positively influencing child growth and development. Conversely, mothers who are not employed may face economic constraints that limit their ability to meet their children's nutritional and healthcare needs, even if they spend more time at home. These results underscore the complex but critical role of maternal employment in shaping child health outcomes, including the risk of stunting.

DISCUSSION

This study reinforces the critical intersection between maternal socioeconomic status and early childhood nutrition, particularly in rural Indonesia. Stunting, a chronic manifestation of early nutritional deprivation, continues to undermine Indonesia's public health objectives, despite national efforts aligned with the Sustainable Development Goals (SDGs) and

Presidential Regulation No. 72/2021. Although the national stunting prevalence has declined from 27.7% in 2019 to 20.4% in 2024 (Ministry of Health, 2024), this study found that 43.8% of toddlers in the Simpang Empat Health Center area remain stunted. This disparity highlights spatial inequalities that are masked by national averages and underscores the importance of investigating local determinants such as maternal employment and maternal knowledge.

The results affirm that maternal knowledge is a statistically significant predictor of stunting ($p = 0.003$), consistent with global evidence that nutritional literacy and caregiving behaviors are foundational to child development (Black et al., 2021). In this study, even non-working mothers with poor knowledge exhibited high rates of stunted children (40.3%), suggesting that the availability of time alone does not ensure quality caregiving. Effective practices, such as exclusive breastfeeding, appropriate complementary feeding, growth monitoring, immunization, and illness management, depend not only on access to services but also on maternal understanding and competence (Adisasmito et al., 2023; Notoatmodjo, 2020).

Maternal employment, while often considered a protective socioeconomic factor, demonstrated a complex relationship with stunting. Although a statistically significant association was found ($p = 0.000$), the actual difference in stunting rates between working mothers (19.3%) and non-working mothers (24.5%) was modest. This suggests that employment status may serve as a proxy for other underlying factors, such as caregiving support, maternal stress, autonomy, and time constraints. In rural areas like Simpang Empat, mothers typically work in informal sectors such as agriculture, plantations, or low-wage manufacturing—roles often characterized by long hours, low pay, and limited childcare support. These structural conditions may offset the potential nutritional benefits of increased income (Rachmad et al., 2022; Yuliasari et al., 2022).

Further research is needed to unpack the causal mechanisms linking maternal employment and knowledge to child nutrition. Employment may have either protective or detrimental effects depending on the nature of the work (formal vs. informal), working hours, access to alternative caregiving arrangements, and mothers' autonomy in household decision-making. Longitudinal studies could help track how changing employment trajectories influence maternal knowledge, stress levels, and caregiving behaviors over time. Similarly, qualitative studies can provide insight into how mothers navigate daily caregiving trade-offs in resource-constrained settings.

These findings reinforce conceptual models in maternal and child health that identify knowledge as a key mediator between socioeconomic empowerment and improved child outcomes (Bhutta et al., 2020; Titaley et al., 2023). Employment can be protective only when

accompanied by access to health services, caregiving support, and adequate maternal knowledge. Therefore, interventions must go beyond income generation to also address education, gender roles, and caregiving infrastructure.

The post-COVID context further complicates these dynamics (Hermanto, 2021). Community-based health services such as *Posyandu* were suspended or restricted between 2020 and 2022, limiting access to growth monitoring and maternal education (UNDP, 2021; UNICEF Indonesia, 2023). Even after services resumed, knowledge gaps persist, and health-seeking behaviors remain inconsistent (Irawati & Arifin, 2020). These disruptions may partially explain the stagnation in stunting reduction during and after the pandemic.

From a systems perspective, these findings support the need for integrated, cross-sectoral strategies. Health promotion must extend beyond information dissemination to include participatory learning delivered in local dialects and culturally appropriate formats. For working mothers, flexible delivery models, such as mobile clinics, workplace-based health education, and digital platforms, can help bridge the gap between knowledge and practice. At the same time, labor policies should support caregiving through extended maternity leave, breastfeeding accommodations, and workplace childcare, particularly within the informal sector (Silalahi, 2024). Health campaigns must also move beyond compliance-driven approaches to foster maternal agency. Behavior change is more effective when led by trusted local actors such as midwives or cadres, and when aligned with mothers' aspirations for their children (Kusnadi et al., 2021; Wahyuni, 2015). Accordingly, community health workers should be trained not only in technical competencies but also in counseling and communication skills to build trust and promote sustained behavioral change.

The broader context of Indonesia's demographic and urban transitions must also be considered. As family sizes shrink and urban migration increases, traditional caregiving networks are weakening. This transformation places greater pressure on individual mothers, particularly in rural areas where access to paid childcare and extended family support is limited. In the absence of state-supported care systems, rising maternal employment may inadvertently exacerbate child health disparities (BKKBN., 2022; Satoto et al., 2022). In conclusion, this study contributes to a growing body of research demonstrating that reducing stunting is not merely a nutritional issue, but a multidimensional challenge rooted in education, gender dynamics, labor conditions, and public health infrastructure. Maternal employment and knowledge are interdependent factors that must be addressed simultaneously. The policy implication is clear: investing in women's work must also involve investing in their capacity to provide care, make informed health decisions, and access support systems. Only through

such holistic approaches can stunting be sustainably reduced especially in rural and semi-urban settings like Simpang Empat (Central Bureau of Statistics., 2023).

CONCLUSIONS

This study concludes that both maternal employment status and maternal knowledge have a statistically significant influence on the incidence of stunting among toddlers in the working area of the Simpang Empat Community Health Center, Asahan Regency. While maternal employment is often linked to economic stability and improved access to resources, it does not inherently reduce the risk of stunting unless accompanied by adequate health knowledge and caregiving capacity. The findings indicate that employed mothers lacking sufficient understanding of child nutrition and growth may still expose their children to stunting risks due to reduced caregiving time and limited engagement in health-promoting behaviors. Conversely, non-working mothers, despite being more present at home, may face constraints in knowledge and resources, which can similarly contribute to poor nutritional outcomes for their children. This study provides empirical evidence on the significance of maternal employment status and knowledge in influencing stunting among toddlers. However, future research should further investigate the broader enabling and constraining factors that shape maternal caregiving capacity. Maternal occupation should not be examined in isolation, but rather in relation to intersecting variables such as educational background, access to health infrastructure, prevailing gender norms, and time poverty. These structural dimensions likely mediate how employment translates into child health outcomes and warrant deeper exploration.

Moreover, this study was conducted in a post-pandemic context, following significant disruptions to Indonesia's community-based health services, such as *Posyandu*, during the COVID-19 period (2020–2022). These disruptions affected the continuity of growth monitoring, maternal counseling, and nutrition support, particularly among lower-income households. Future studies should examine how recovery trajectories, service restoration, and health system resilience have influenced maternal knowledge and child nutritional outcomes. Longitudinal and mixed-method approaches are recommended to capture both temporal changes and contextual depth. By integrating these structural and systemic elements, future research can generate more comprehensive insights and inform evidence-based interventions that move beyond individual behavior change to address the root causes of stunting.

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