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Knowledge, Motivation, and Accuracy of Anthropometric Measurement among Village Health Volunteers to Prevent Stunting in Aceh

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Abstract
Early detection and prevention of stunting are top priorities in improving child health outcomes in Indonesia. The village health volunteers play a strategic role in monitoring toddler growth through accurate anthropometric measurements. However, their levels of knowledge, motivation, and measurement precision vary considerably. This study aims to describe the knowledge, motivation, and accuracy of anthropometric measurements among village health volunteers in the early detection and prevention of stunting. A cross-sectional study design was employed, involving 110 village health volunteers in a rural district of Aceh, Indonesia. Data were collected through questionnaires and direct observations and analysed using univariate tests. The results indicate that the village health volunteers possess a medium level of knowledge, motivation, and accuracy in anthropometric measurement. The findings underscore the importance of enhancing the capacity of health volunteers through ongoing training, intensified supervision, and support from multiple stakeholders, thereby enabling village health volunteers to play a more effective role in the early detection and prevention of stunting.

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Introduction

One of the significant public health challenges in Indonesia is chronic malnutrition, commonly referred to as stunting (Harahap, Amelia, Andayani, Lubis, & Aulia, 2022). According to the 2022 Indonesian Nutritional Status Survey (SSGI), the national prevalence of stunting reached 21.6%. This figure remains significantly above the national target of 14% by 2024 (Ministry of Health of the Republic of Indonesia, 2022). Stunting has long-term consequences on children's physical growth and cognitive development, ultimately impacting the quality of the nation's human resources (World Health Organization, 2021). Therefore, early detection and prevention of stunting have become critical priorities in improving child health in Indonesia.

Village health volunteers play a crucial role in supporting stunting prevention programs by monitoring the growth of toddlers at the village level (Priyono, 2020). One key aspect of this monitoring is the accurate and precise measurement of anthropometric indicators. However, research has indicated that gaps remain in the knowledge, motivation, and precision of Village health volunteers in conducting anthropometric measurements (Mintarsih, Susiloretni, Ismawanti, Ambarwati, & Wijayanti, 2025); (Rahayu et al., 2021) (Rahmadi, Rusyantia, & Wahyuni, 2023). Measurement errors may lead to misclassification of children's nutritional status and result in inappropriate interventions.

Preliminary data obtained from interviews with the head of the health promotion division of the Sabang City Health and Family Planning Agency revealed that 230 Village health volunteers are distributed across six community health centers in Sabang City, yet they have not received optimal guidance. Interviews with one of the village health volunteer leaders indicated that some village health volunteers had participated in refresher activities organized by the community health centers, which focused on effective counseling techniques and reporting mechanisms. However, no prior assessments have explored the village health volunteers' knowledge, motivation, and precision in anthropometric measurement for early detection and prevention of stunting. This prompted the researchers to investigate these aspects among Village health volunteers in Sabang City.

Method

This study employed a survey-based cross-sectional design conducted in Sabang City. The research was conducted in three sub-districts served by six community health centers, with village selection based on the highest prevalence of stunting.

Data collection and processing took place over one month in March 2025. The study population consisted of Village health volunteers in Sabang City. Using a power analysis with 0.80 power, an effect size of 0.40, and an alpha value of 0.05, the minimum sample size was calculated to be 99. After adjusting for a 10% dropout rate, the final sample size was determined to be 110 (Cohen, 1988). The inclusion criteria were: officially registered village health volunteers at the village office, willingness to complete the program, ability to read and write, and no prior formal village health volunteer training experience.

Data were collected using structured questionnaires and observation sheets. The knowledge variable was measured using a questionnaire adapted from a study by Wildiningsih, Ni Luh, and Ni Ketut A.M. (2023), which comprised nine items validated through face validity testing (r-value > r-table) with a Cronbach's alpha of 0.74. The motivation variable was assessed using a 13-item questionnaire adapted from Liyunzira (2023), also validated through face validity (r-value > r-table) and a Cronbach's alpha of

0.87. Measurement precision was assessed by enumerators using an observation checklist adapted from the standard procedures outlined in the Basic Health Village Health Volunteer Skills Manual, published by the Ministry of Health in 2023. This checklist includes three domains: height (Cronbach's alpha 0.978, rxx = 0.883), length (Cronbach's alpha 0.984, rxx = 0.912), and weight (Cronbach's alpha 0.87, rxx = 0.924), all of which had been tested for face validity and inter-rater reliability. Descriptive statistics were used to analyze the collected data, and the results were presented using median values and interquartile range (IQR).

Result and Discussion

1. Result

This study involved 110 respondents. The most dominant age group was 36–45 years (37.3%). The majority of participants had completed senior high school (73.6%). In terms of occupation, the most common category was "others," which primarily referred to housewives (67.3%). Additionally, 40% of respondents had served as Village health volunteers for 7–10 years. The detailed demographic characteristics of the respondents are presented in Table 1.

The analysis revealed a median knowledge score of 60.00 with an interquartile range (IQR) of 20, indicating considerable variability in the village health volunteers' understanding, with some exhibiting lower levels of knowledge. The median motivation score was 33.00 (IQR 7), indicating that village health volunteers' motivation levels were generally moderate but varied, with some volunteers showing relatively low motivation. The median measurement precision score for the Village health volunteers was 80.00 (IQR 20). This variability in measurement skills suggests that disparities persist in the village health volunteers' ability to perform anthropometric measurements accurately, which could potentially lead to errors in identifying children at risk of stunting.

Table 1
Frequency Distribution of Respondent Characteristics (n=110)

Respondent Characteristics	Frequency	Percentage (%)
Age		
26-35 Years	38	34.5
36-45 Years	41	37.3
46-59 Years	31	28.2
Educational level		
JHS	7	6.4
SHS	81	73.6
College	22	20.0
Employment status		
Unemployed / Retired	18	16.4
Farmer / Trader / Laborer	18	16.4
Other	74	67.3
Years of Service as a Village health volunteer		
1-3 Years	39	35.5
4-6 Years	27	24.5
7-10 Years	44	40.0

Table 2
Univariate Analysis of Knowledge, Motivation, and Measurement Precision Among Village Health Volunteers in the Early Detection and Prevention of Stunting in Toddlers in Sabang City (n = 110)

Variable	Median	IQR
Knowledge	60.00	20
Motivation	33.00	7
Measurement Precision	80.00	20

2. Discussion

Knowledge of Village Health Volunteers on Stunting Prevention

The study found that the median knowledge score among village health volunteers regarding stunting prevention was 60.00 on a scale of 0–90, with an interquartile range (IQR) of 20. This variability in scores indicates differing levels of understanding among the village health volunteers in recognizing risk factors, early signs, and appropriate prevention strategies for stunting. While the majority demonstrated an adequate level of knowledge, a subset of village health volunteers still exhibited relatively low knowledge scores. Therefore, continuous capacity-building efforts, particularly through sustainable training programs, remain essential. These findings are supported by a study conducted by Setianingsih et al. (2022), which examined the knowledge levels of health village health volunteers involved in stunting prevention programs in Semarang Regency, Central Java . The study concluded that strengthening knowledge and providing ongoing mentorship are vital to enhancing the effectiveness of such initiatives (Setianingsih, Musyarofah, & Indrayati, 2022). Similarly, Fitri and Zulisa (2022) found a significant correlation between the knowledge levels of Village health volunteers and their ability to conduct early detection of stunting in the working area of the Susoh Community Health Center in Southwest Aceh (Fitri & Zulisa, 2023).

Further support is provided by Rospiati and Urnia (2023), who demonstrated that empowering Village health volunteers significantly improved their knowledge related to stunting prevention efforts (Era & Urnia, 2023). In addition, Weningtyas, Ma'rufa, and Fauziah (2023) reported that short-term training interventions, specifically short courses, had a statistically significant impact on increasing the knowledge of village health volunteers in the early detection of stunting (Weningtyas, Lina Ma'rufa, & Fauziah, 2023).

Motivation of Village Health Volunteers

The median motivation score of the Village health volunteers was 33.00, with an interquartile range (IQR) of 7. This indicates that the general motivation level of village health volunteers was moderate, with individual variations among respondents. Most village health volunteers had a senior high school education background (73.6%), which may influence their perception of village health volunteer responsibilities as part of their social obligation. Additionally, their length of service plays a role in shaping their motivation. The study found that 40.0% of village health volunteers had served for 7–10 years, while 35.5% had only 1–3 years of experience.

A longer service duration is generally associated with higher motivation, as village health volunteers tend to better understand the benefits and positive impact of their roles in improving community health. However, it is crucial to recognize that village health volunteer motivation is not solely determined by education and experience; external

support—from the government, healthcare professionals, and the local community—also plays a significant role in this process. Village health volunteers who feel appreciated and supported are more likely to be highly motivated in carrying out their duties.

This aligns with findings from Abdullah (2020), who reported a significant relationship between knowledge, motivation, and the implementation of early detection of child development among toddlers and preschool-aged children. The study also emphasized the importance of enhancing both knowledge and motivation to optimize the early detection of child development practices (Abdullah, 2017).

Similarly, research by Rospiati and Urnia (2023) confirmed that empowering Village health volunteers effectively increased their motivation, contributing significantly to the reduction of stunting prevalence. Mediani et al. (2022) further emphasized that the knowledge and motivation of health village health volunteers are critical success factors in stunting prevention programs. Therefore, enhancing village health volunteer capacity through continuous training and providing both technical and emotional support is essential to reinforce their roles as the frontline actors in early detection and community-based stunting intervention efforts (Mediani, Hendrawati, Pahria, Mediawati, & Suryani, 2022).

Precision of Village health volunteers (Anthropometric Measurement Competency)

Based on the study findings, the median precision score of village health volunteers in conducting anthropometric measurements was 80.00, with an interquartile range (IQR) of 20. This suggests that even village health volunteers with extensive experience may not consistently employ the most accurate and up-to-date measurement techniques in the absence of regular training. A similar observation was reported in a study by Putra et al. (2024) at the Melati Integrated Health Service Post in Bogor City, which demonstrated that anthropometric measurement training significantly improved the knowledge and skills of village health volunteers. The study emphasized that appropriate training enhances the competency of village health volunteers in measuring anthropometric indicators, which is essential for ensuring the accuracy of child nutrition data in stunting prevention efforts (Putra, Anggiruling, Amrinanto, & Muthmainah, 2024). Similarly, a study by Azizan and Purwaningtyas (2023) examined the effect of village health volunteer training on enhancing skills in height measurement and stunting assessment among toddlers in Kadubale Village, Banjar Subdistrict, Pandeglang District. Their findings confirmed that training was effective in enhancing village health volunteers' anthropometric measurement skills and their ability to assess stunting status (Azizan, Rahayu, & Aini, 2023).

Research conducted by Lestari, Kurniati, and Hidayati (2022) further indicated that enhancing technical knowledge through hands-on training could significantly improve the accuracy of anthropometric data collected at Integrated Health Service Posts, thereby supporting more targeted interventions to address stunting in the community (Lestari, Kurniati, & Hidayati, 2023). Similarly, Rospiati and Urnia (2023) highlighted that a strong foundation in health education empowerment programs could substantially improve village health volunteers' measurement accuracy in identifying stunting prevalence.

The implications of these findings are significant for improving service quality at the Integrated Health Service Post level, especially in the context of early detection and prevention of stunting among toddlers. Measurement errors can lead to misclassification of a child's nutritional status, which in turn may result in inappropriate nutritional

interventions. Therefore, it is recommended to implement periodic technical training, ensure the use of standardized measurement tools, and conduct regular field supervision to guarantee the correct application of measurement techniques by village health volunteers. Moreover, further research is needed to evaluate specific strategies aimed at improving the measurement precision of village health volunteers. Such findings will be instrumental in informing evidence-based policy-making for the empowerment of village health volunteers and the reduction of stunting.

Conclusion

Based on the study findings, it can be concluded that the knowledge, motivation, and precision of Village health volunteers in conducting anthropometric measurements remain varied. While the majority of village health volunteers demonstrated an adequate level of understanding, some still showed relatively low knowledge, indicating a need for ongoing capacity-building through continuous training.

The motivation of village health volunteers in fulfilling their duties also showed considerable variation. Several factors, including work experience, government and community support, and the availability of incentives, influence the motivation of village health volunteers. Those with longer experience generally exhibited higher motivation; however, without adequate support, their enthusiasm and performance may decline over time.

Furthermore, the precision with which village health volunteers performed anthropometric measurements also varied, reflecting differences in their skills and competencies. Inaccurate measurements can lead to a misinterpretation of toddlers' nutritional status, potentially resulting in inappropriate interventions.

Therefore, continuous training, intensive supervision, and strong support from multiple stakeholders are essential to enhance the role of Village health volunteers in the early detection and prevention of stunting among toddlers.

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