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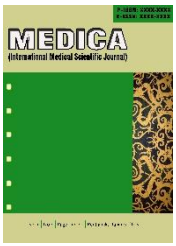

Factors Analysis of Stunting Prevention Effort in Mother of Toddlers through Snehandu B. Karr Theory Approach

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Abstract

Stunting remains a major global public health problem reflecting chronic malnutrition in children and contributing substantially to under-five mortality worldwide. This study aimed to analyze the dominant factors influencing stunting prevention efforts among mothers of toddlers using the Snehandu B. Karr theoretical approach in the working area of Wire Public Health Center, Tuban Regency. An analytical cross-sectional design was employed in August 2022 involving 200 mothers of toddlers selected through quota sampling. Data were collected using a structured questionnaire developed based on the Snehandu B. Karr theory to assess internal and external determinants of preventive behavior. Univariate analysis was conducted to describe respondent characteristics and study variables, while bivariate and multivariate analyses using logistic regression were performed to identify significant and dominant factors. The results showed that social support ($p = 0.029$), behavioral intention ($p = 0.018$), and autonomy ($p = 0.018$) were significantly associated with stunting prevention efforts, whereas access to information ($p = 0.998$) and situational factors ($p = 0.999$) were not significantly related. Behavioral intention was identified as the most dominant factor influencing stunting prevention behavior among mothers. In conclusion, strengthening maternal behavioral intention, enhancing social support, and promoting autonomy are crucial to improving stunting prevention efforts; therefore, future studies should focus on intervention-based and longitudinal approaches to better understand causal relationships and evaluate the effectiveness of behavior change strategies.

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1. INTRODUCTION

Malnutrition remains a global public health concern, particularly in the form of stunting, which is defined as impaired linear growth or low height-for-age (WHO, 2020). Stunting reflects chronic malnutrition and carries long-term developmental, economic, social, and health consequences, not only for individuals but also for families and societies (WHO, 2020). According to the World Health Organization, stunting is identified when a child's height-for-age is ≤ −2 standard deviations (SD) below the median of the WHO Child Growth Standards (Patimah, 2021). Alarmingly, malnutrition contributes to nearly half of all deaths among children under five years old, primarily by increasing susceptibility to infections and delaying recovery (UNICEF, 2023). Globally, an estimated 149.2 million children under five (approximately 22%) were affected by stunting in 2020, showing a decline from 203.6 million cases in 2000, yet still representing a substantial burden (WHO, 2020). In Southeast Asia, stunting remains the most prevalent form of malnutrition, affecting around 25% of children under five, a figure that remains high despite economic growth in the region (UNICEF, 2021). Regions such as South Asia, Southeast Asia, and Sub-Saharan Africa continue to face the greatest challenges, with more than 148 million children still affected globally (Scheiner, 2023).

In Indonesia, stunting prevalence has shown gradual improvement, decreasing from 24.4% in 2021 to 21.6% in 2022; however, this rate remains above the national target of 14% set for 2024 (Munira, 2023). A similar trend is observed in Tuban Regency, where stunting prevalence declined from 25.1% in 2021 to 17.8% in 2023, yet continued efforts are required to achieve national targets (Tuban Regency Communication, Information, Statistics, and Coding Agency, 2024). Stunting is a manifestation of chronic nutritional deficiency often associated with inadequate dietary intake and recurrent infections, beginning as early as the prenatal period (Helmyati et al., 2020). The first 1000 days of life represent a critical window, during which nutritional deficiencies can lead to irreversible developmental impairments (Nurlinda et al., 2021). The determinants of stunting are multifactorial, including direct factors such as dietary intake and health status, as well as indirect factors such as food insecurity, socioeconomic conditions, environmental sanitation, and access to health services (Office of the Vice President of the Republic of Indonesia, 2019; Utami et al., 2019).

Various theoretical frameworks have been applied to understand stunting prevention behavior. Studies using the Health Promotion Model have identified perceived vulnerability, perceived severity, perceived barriers, self-efficacy, social support, and community organization as significant predictors of prevention behavior (Soviyati et al., 2023). Similarly, the Health Belief Model has highlighted perceived benefits and self-efficacy as influential factors, although other constructs such as perceived vulnerability and barriers were not consistently associated (Nenobais & Katmini, 2021). However, these approaches tend to emphasize individual cognitive perceptions rather than integrating broader behavioral determinants. Evidence from global contexts, such as the Democratic Republic of Congo, further indicates that structural factors including poverty, limited access to clean water, sanitation, and media exposure also play critical roles in stunting prevention, with maternal knowledge often being the primary focus of intervention strategies (Huo et al., 2022; World Bank, 2024). In addition, research has explored maternal experiences, such as exposure to intimate partner violence, and its association with breastfeeding practices, yet the role of behavioral intention in stunting prevention remains insufficiently examined (Bhatt Carreno et al., 2024).

Despite extensive research, a significant gap persists in understanding stunting prevention behavior through an integrative framework that simultaneously examines

internal (e.g., behavioral intention, autonomy) and external factors (e.g., social support, access to information, situational conditions). Most previous studies have focused on partial determinants, particularly individual perceptions or knowledge, without comprehensively addressing the interaction between personal and environmental influences. This gap highlights the need for a more holistic behavioral approach. Therefore, this study introduces the application of Snehandu B. Karr's theory, which emphasizes the interplay between behavioral intention, social support, accessibility of information, personal autonomy, and action situation as determinants of health behavior. This research lies in the use of this integrative theoretical framework to analyze stunting prevention efforts among mothers of toddlers, providing a more comprehensive understanding compared to prior studies that primarily focused on individual-level constructs.

In response to these gaps, this study aims to analyze the dominant factors influencing stunting prevention behavior among mothers of toddlers using the Snehandu B. Karr theoretical approach in the working area of Wire Public Health Center, Tuban Regency. The findings are expected to contribute to the development of evidence-based policies, enhance health promotion strategies by strengthening maternal behavioral intention, and support community health workers and cadres in fostering a more supportive social environment for effective stunting prevention.

2. METHOD

This study employed an analytical cross-sectional design conducted in August 2022 in the working area of Wire Public Health Center, Tuban Regency, East Java, Indonesia. The study population consisted of all mothers of toddlers aged 2–5 years residing in the study area, with a total population of 400 individuals. The sample size was determined using a standard sample size formula, resulting in 200 respondents. Participants were selected using a non-probability sampling technique with a cluster sampling approach.

The inclusion criteria were mothers who had toddlers aged 2–5 years, were able to read and write, and were willing to participate in the study. The exclusion criteria included mothers who were primigravida and those who declined to participate. Prior to data collection, all respondents were provided with a clear explanation of the study objectives, procedures, potential benefits, and risks. Written informed consent was obtained from each participant before enrollment.

Data were collected using a structured questionnaire consisting of 25 items related to stunting prevention behavior, developed based on Snehandu B. Karr's theoretical framework. The questionnaire assessed key variables including behavioral intention, social support, access to information, personal autonomy, and situational factors. Data collection was conducted through guided self-administration with assistance from trained interviewers when necessary.

Descriptive (univariate) analysis was performed to present the characteristics of respondents and the distribution of study variables in percentages. Furthermore, inferential analysis using logistic regression was conducted to identify significant associations and determine the dominant factors influencing stunting prevention behavior among mothers of toddlers.

This study received ethical approval from the Institutional Ethics Committee of the host institution (Number: K/866/KEPK-Poltekkes_Sby/V/2022). All procedures adhered to ethical standards, and participants' confidentiality and anonymity were strictly maintained throughout the study.

3. RESULTS AND DISCUSSION

Table 1. The distribution of mother of toddler characteristics in work area of Public Health Center in Tuban Regency in August 2022.

Variables	Frequency (n=200)	Percentage (%)
Age		
20-35 years old	139	69.5
>35 years old	61	30.5
Level of education		
Without formal education	1	0.5
Elementary	31	15.5
Secondary	105	52.5
Tertiary	47	23.5
Higher education	16	8
Work status		
None or domestic work	157	78.5
Remunerated work	43	21.5
Monthly salary		
<2.5 million rupiah	154	77
>2.5 million rupiah	46	23

Table 1 reveals that majority of the mothers were 20-35 years old (69.5%), secondary education (52.5%), the higher proportion of none or domestic work (78.5%) and monthly salary less than 2.5 million rupiah (77%).

Table 2. Factor analysis of stunting prevention effort in mother of toddlers through Snehandu B. Karr theory approach in work area of Wire Public Health Center, Tuban Regency.

Variables	Sig.	95.5% C.I for EXP (B)	
		Lower	Upper
Social support	.029	1.127	8.874
Behavior intention (niat)	.018	1.243	10.195
Autonomy	.018	1.239	9.702
Access of information	.998	.000	
Situation	.999	.000	
Constant	.999		

Table 2 reveals the results of each variable that was reviewed Snehandu B. Karr Theory to analyze the dominant variable of stunting prevention effort of mother. The research found that only social support, behavior intention, and autonomy were significant factor of stunting prevention behavior. Social support variable had regression coefficient of 1.151 with significancy value of 0.029 (<0.05). Hypothesis was accepted due to the level of significancy was less than 0,05. It reveals that social support affected the stunting prevention effort significantly. The behavior intention variable had regression coefficient was 1.270 with significancy value of 0.018 (<0.05). Hypothesis was accepted due to the level of significancy was less than 0.05. It reveals that behavior intention affected the stunting prevention effort significantly. Autonomy variable had regression coefficient was 1.243 with significancy value of 0.018 (<0.05). Hypothesis was accepted due to the level of significancy was less than 0.05. It reveals that autonomy affected the stunting prevention effort significantly.

Information access variable had regression coefficient was -18.625 with significancy value of 0.998 (>0.05). Hypothesis was unaccepted due to the level of significancy was

higher than 0,05. It reveals that information access was not affect the stunting prevention effort significantly. Situation variable had regression coefficient was -18.833 with significancy value of 0.999 (>0.05). Hypothesis was unaccepted due to the level of significancy was higher than 0.05. It reveals that situation was not affect the stunting prevention effort significantly.

Based on the characteristics of the respondents, the majority of mothers of toddlers were aged 20–35 years, which represents the optimal reproductive age. Maternal age at first birth plays an important role in determining child health outcomes, including the risk of stunting. Mothers who become pregnant at a younger age, particularly below 18 years, are generally less prepared physically and psychologically, which may increase the likelihood of adverse outcomes such as stunting (Kumar et al., 2021). Supporting this, a study conducted in Ethiopia found that children born to younger mothers aged 15–24 years were 2.8 times more likely to experience stunting compared to those born to mothers aged above 35 years (Tekeba et al., 2023). These findings highlight the importance of maternal maturity and readiness in promoting optimal child growth and development.

In terms of education, most mothers in this study had a secondary level of education. Maternal education is a crucial determinant in stunting prevention, as it influences knowledge, attitudes, and health-related practices. Higher levels of education are generally associated with better understanding and implementation of appropriate nutritional and childcare practices (Bukit et al., 2023). Previous research has also demonstrated that maternal education is significantly associated with the incidence of stunting among children under five years old (Susilowati, Setiawan, & Budiana, 2019). Furthermore, evidence from Africa indicates that mothers with lower educational levels are 1.72 times more likely to have stunted children, emphasizing the role of education in addressing food insecurity, malnutrition, and their long-term consequences (Wand et al., 2024).

The findings of this study also revealed that the majority of mothers were not formally employed and had a monthly family income of less than 2.5 million rupiah, which is below the regional minimum wage of Tuban Regency (Tuban Regency Communication, Information, Statistics, and Cryptography Agency, 2022). Socioeconomic status is a well-established determinant of child nutritional status. Limited income reduces the household's ability to provide adequate and nutritious food, thereby increasing the risk of stunting (Amusa, Yahya, & Bengesai, 2023). Interestingly, a study in Indonesia reported that children raised in urban areas by working mothers were more likely to experience stunting, possibly due to suboptimal breastfeeding practices and reduced maternal caregiving time (Supadmi et al., 2024). Additionally, working mothers often delegate childcare responsibilities to other family members or caregivers, which may affect the quality of childcare practices (Utami et al., 2022). These findings suggest that both economic constraints and caregiving patterns contribute to stunting risk.

This study identified social support as a significant factor influencing stunting prevention behavior among mothers. Social support, including emotional, informational, instrumental, and appraisal support, plays a critical role in encouraging positive health behaviors (Pandani, 2021). Mothers who receive strong support from family and community are more likely to demonstrate higher motivation and intention to engage in stunting prevention practices (Suminar et al., 2021). This underscores the importance of strengthening community-based interventions and family involvement in promoting child health.

Behavioral intention was also found to significantly influence stunting prevention behavior and emerged as the dominant factor in this study. Behavioral intention reflects

an individual's readiness and commitment to perform a specific behavior (Nankya-Mutyoba et al., 2019). In this context, maternal intention represents the willingness to adopt preventive practices such as providing balanced nutrition, maintaining hygiene, ensuring exclusive breastfeeding, and monitoring child growth. Previous studies have shown that intention is shaped by attitudes, subjective norms, and perceived behavioral control, which collectively drive health-related behaviors (Suminar et al., 2021). Consistent findings from Kupang Regency also demonstrated that strong maternal intention is associated with improved practices, including providing nutritious food, attending regular health check-ups, and implementing appropriate parenting strategies (Marni et al., 2023). This highlights the central role of behavioral intention as a key driver of stunting prevention efforts.

Autonomy was another significant factor identified in this study. Maternal autonomy refers to the ability to make independent decisions regarding health, nutrition, and childcare practices. In many contexts, including Indonesia, sociocultural norms such as patriarchal systems may limit women's decision-making power (Mangimela-Mulundano et al., 2022). Greater autonomy enables mothers to make informed choices regarding child nutrition and healthcare, thereby reducing the risk of stunting. Previous studies have demonstrated that maternal autonomy, including self-efficacy, self-esteem, and control over financial resources, is strongly associated with improved child nutritional outcomes (Kamiya et al., 2018). Enhancing women's empowerment through education and gender equality initiatives is therefore essential to strengthen stunting prevention efforts (Yuhan et al., 2024).

In contrast, this study found that access to information was not significantly associated with stunting prevention behavior. This finding differs from previous studies, which suggest that access to media and health information plays a crucial role in improving maternal knowledge and practices (Amusa, Yahya, & Bengesai, 2023). One possible explanation is that although information may be widely accessible through various channels such as television, radio, and digital platforms, it does not necessarily translate into behavioral change without adequate motivation and support. Innovations such as mobile health applications have been developed to enhance maternal knowledge and facilitate communication with healthcare providers (Friska & Andriani, 2022). Additionally, the role of health workers and community cadres remains essential in delivering accurate and practical information to mothers (Nasution et al., 2019). Therefore, information alone may be insufficient without reinforcement through social and behavioral factors.

Similarly, situational factors were not found to have a significant association with stunting prevention behavior in this study. Situational factors generally refer to environmental conditions such as sanitation, hygiene, and access to clean water. This finding contrasts with previous research indicating that environmental conditions significantly influence maternal behavior and child nutritional outcomes (Noviana et al., 2024; Novianti et al., 2023). Poor sanitation and limited access to safe drinking water have been widely recognized as contributing factors to chronic malnutrition (Nuraeni et al., 2024). The lack of significance in this study may be attributed to relatively homogeneous environmental conditions among respondents or the stronger influence of behavioral and psychosocial factors, such as intention and social support, in shaping preventive behaviors.

Despite providing valuable insights, this study has several limitations. First, the cross-sectional design limits the ability to establish causal relationships between variables. Second, the use of non-probability sampling may reduce the generalizability of the findings to broader populations. Third, data collection relied on self-reported questionnaires, which

may be subject to recall bias and social desirability bias. Future studies are recommended to employ longitudinal or experimental designs, utilize probability sampling techniques, and incorporate objective measurements to strengthen the validity and reliability of findings related to stunting prevention behavior.

4. CONCLUSION

The findings demonstrate that social support, behavioral intention, and maternal autonomy are significant determinants of stunting prevention efforts, while access to information and situational factors do not show a significant influence. Among these variables, behavioral intention emerges as the most dominant factor, highlighting the central role of maternal commitment and willingness in adopting preventive practices. These findings imply that both internal factors, such as intention and autonomy, and external factors, such as social support, play an important and interconnected role in shaping stunting prevention behavior. Strengthening maternal awareness of their primary role in child nutrition and caregiving is essential to improve children's nutritional status. In addition, healthcare workers are expected to function not only as service providers but also as educators and facilitators who actively support mothers through counseling, guidance, and continuous engagement.

Based on these results, it is recommended that future interventions focus on enhancing maternal behavioral intention and empowerment through community-based programs, family involvement, and culturally appropriate health promotion strategies. The development of targeted interventions that integrate both behavioral and environmental aspects is crucial to ensure sustainable stunting prevention efforts. Furthermore, future research should explore variations in stunting prevention practices based on the child's age and nutritional needs, particularly before and after the introduction of complementary feeding, in order to provide more specific and effective recommendations.

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