AG EDITOR

Factors Associated with Maternal Behavior in Nutritional Parenting of Toddlers in Karangasem Regency

Factores Asociados con el Comportamiento Paternal en la Crianza Nutricional de Niños Pequeños en el Distrito de Karangasem

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ABSTRACT

Introduction: toddlerhood is a critical period for growth, and inadequate nutrition during this stage may lead to stunting and developmental delays. This study aimed to analyze factors associated with maternal nutrition behavior using the Health Belief Model (HBM) framework.
Method: a cross-sectional study was conducted in Kesimpar Village, Karangasem, Bali, involving 60 mothers with toddlers using total sampling. Data were collected through structured questionnaires measuring six HBM constructs: perceived susceptibility, severity, benefits, barriers, cues to action, and self-efficacy. Maternal behavior in nutritional parenting was the dependent variable. Data were analyzed using Spearman's rank correlation test.
Results: the majority of mothers had high perceived susceptibility (95 %) and moderate perceived severity (98 %), yet no significant associations were found for these constructs (p = 0,135 and p = 0,534, respectively). Perceived benefits (p = 0,012), perceived barriers (p = 0,018), and self-efficacy (p = 0,000) were significantly associated with maternal behavior. Mothers with strong beliefs in the benefits of proper nutrition, low perceived barriers, and higher self-efficacy demonstrated better feeding practices.
Conclusions: maternal nutrition behavior is influenced more by belief in benefits, perceived barriers, and self-efficacy than by perceived risk or external cues. Interventions should emphasize empowering mothers through practical support and confidence-building strategies to improve toddler nutrition.

Keywords: Maternal Behavior; Toddler Nutrition; Health Belief Model; Self-Efficacy; Parenting; Stunting.

RESUMEN

Introducción: la etapa del niño pequeño es crítica para el crecimiento, y una nutrición inadecuada puede provocar retraso del desarrollo y baja talla. Este estudio analizó los factores asociados al comportamiento materno en la alimentación según el modelo Health Belief Model (HBM).
Método: se realizó un estudio transversal en la aldea de Kesimpar, Karangasem, Bali, con 60 madres de niños pequeños mediante muestreo total. Los datos se recopilaron mediante cuestionarios estructurados sobre

seis constructos del HBM: susceptibilidad percibida, gravedad, beneficios, barreras, señales para la acción y autoeficacia. El comportamiento materno fue la variable dependiente. Se utilizó la prueba de correlación de Spearman.

Resultados: la mayoría de las madres presentaron alta susceptibilidad percibida (95 %) y gravedad moderada (98 %), pero estas variables no se asociaron significativamente con el comportamiento (p = 0,135 y p = 0,534). En cambio, los beneficios percibidos (p = 0,012), las barreras percibidas (p = 0,018) y la autoeficacia (p = 0,000) mostraron asociaciones significativas con mejores prácticas de alimentación.

Conclusiones: el comportamiento nutricional materno se ve más influido por la percepción de beneficios, barreras y autoeficacia que por el riesgo percibido. Las intervenciones deben centrarse en fortalecer la confianza de las madres y reducir obstáculos prácticos para mejorar la nutrición infantil.

Palabras clave: Comportamiento Materno; Nutrición Infantil; Modelo de Creencias de Salud; Autoeficacia; Crianza; Talla Baja.

INTRODUCTION

Early childhood, particularly during the toddler years (ages 1-5), represents a fundamental phase in the life span, marked by rapid physical, cognitive, and emotional development.[1,2] Nutritional intake during this critical period serves as the cornerstone for lifelong health and development.[3] However, inadequate nutrition remains a major concern in many developing nations, including Indonesia. Insufficient intake of essential nutrients can result in various growth and developmental challenges, including stunting, wasting, and impaired cognitive ability. According to the World Health Organization, approximately 1,5 million children under

the age of five die each year due to suboptimal feeding practices, with the majority of these deaths occurring in low- and middle-income countries.[4]

In the Indonesian context, numerous cases of toddler malnutrition have been linked not only to economic constraints but also to inadequate parental knowledge and behavior concerning proper child feeding.[5] Among caregivers, mothers hold a particularly influential role. Their behaviors, perceptions, and decision-making capacities directly impact the nutritional choices available to children.[6] Effective nutritional parenting is not solely determined by knowledge; it also involves attitudes, beliefs, and perceived competencies.[7,8,9]

Eating behavior in toddlers is shaped by multiple factors, including food texture, aroma, taste preferences, and serving size.[10] Toddlers often display erratic eating behaviors—consuming specific foods repeatedly and then abruptly rejecting them.[11] As such, offering varied, appropriately portioned, and attractively presented meals can significantly enhance intake and improve nutritional outcomes. Scheduled meals, consistent feeding routines, and positive eating environments also contribute to more successful feeding behaviors.[12]

Parenting style plays a decisive role in determining a child's nutrition status.[13] Nutritional parenting involves not only the physical act of feeding but also includes emotional support, role modeling, and the creation of a stable mealtime routine.[11] When parents model healthy eating, provide nutritious food consistently, and avoid coercive feeding practices, children are more likely to adopt positive attitudes toward food.

The Health Belief Model (HBM), a well-established theoretical framework, is frequently employed to understand and predict health behaviors.[8] It posits that individual actions regarding health are influenced by six key constructs: perceived susceptibility (beliefs about the likelihood of acquiring a disease), perceived severity (beliefs about the seriousness of the consequences), perceived benefits (beliefs in the efficacy of advised actions), perceived barriers (beliefs about obstacles to taking action), cues to action (external prompts to trigger behavior), and self-efficacy (confidence in one's ability to perform the behavior).[9] This model has been successfully used to examine maternal behaviors in nutrition, especially in identifying determinants that encourage or hinder proper child feeding practices.

Research consistently demonstrates that these HBM constructs can predict maternal behavior in providing nutrition, although the strength of the association varies by context. For example, Ferdian et al. found significant correlations between perceived susceptibility, perceived benefit, and self-efficacy with maternal feeding behavior, while perceived severity and perceived barriers had weaker associations. Similarly, Hupunau et al. identified perceived barriers as a major determinant influencing nutritional parenting among mothers of toddlers.[14]

Thus, integrating behavioral theories like HBM into nutrition-focused interventions may enhance the effectiveness of programs aiming to prevent malnutrition and stunting in early childhood.

In Kesimpar Village, located in the Abang District of Karangasem Regency, malnutrition among toddlers remains a pressing health issue. Despite the availability of basic health services and public health campaigns,

behavioral gaps persist. Initial observations and field interviews revealed that many mothers faced challenges in consistently implementing healthy feeding behaviors, often due to socio-economic barriers, limited nutritional knowledge, or lack of confidence in preparing balanced meals.

This study seeks to investigate the maternal factors associated with nutritional parenting practices in this community through the lens of the Health Belief Model. By identifying which HBM components significantly correlate with maternal behavior, the findings aim to provide evidence-based insights that can inform the development of targeted health education and intervention strategies, ultimately contributing to the reduction of childhood malnutrition in rural Indonesian settings.

METHOD

This study employed a descriptive-analytic design with a cross-sectional approach, aimed at exploring the relationship between maternal perceptions and behaviors concerning nutritional parenting in toddlers. The research was conducted in Kesimpar Village, Abang District, Karangasem Regency.

Study Population and Sample

The population consisted of all mothers with toddlers aged 1–5 years in Kesimpar Village. A total sampling technique was used, resulting in 60 respondents who met the inclusion criteria and consented to participate.

Measurement Instruments

A structured questionnaire based on the validated instrument by Hupunau et al. was used. It included Likert-scale questions to assess each HBM component and the behavioral outcome.
- Scores were categorized as low (<60 %), moderate (60–75 %), and high (>75 %) for each HBM dimension.
- Maternal behavior was categorized as good (>18 points), moderate (12–18 points), and poor (<12 points).

The reliability of each scale is as follows: perceived susceptibility α=0,761, perceived severity α=0,883, perceived Benefit α=0,779, perceived barrier α=0,779, and perceived cues to action α=0,856. The face validity was done with I-CVI 0,85-1,00 and S-CVI 0,90.

Data Collection

Data collection was performed through face-to-face interviews conducted by trained enumerators at the respondents' homes. All participants received detailed explanations and signed informed consent forms.

Data Analysis

Descriptive statistics were used to summarize demographic characteristics. Spearman's rank correlation test was selected over ordinal regression for analyzing the ordered Health Belief Model (HBM) categories due to both methodological and practical considerations. The HBM constructs were measured using Likert-scale responses, which generate ordinal data where the distances between categories cannot be assumed equal. Spearman's correlation is a non-parametric method that is well-suited for identifying the strength and direction of associations between such ordinal variables without requiring the proportional odds assumption inherent in ordinal regression. Furthermore, the use of regression models in this context carries the risk of multicollinearity, as HBM constructs such as perceived susceptibility, perceived severity, and perceived barriers often exhibit strong intercorrelations. Multicollinearity can compromise the stability and interpretability of regression coefficients. In contrast, Spearman's test allows for direct assessment of pairwise relationships while minimizing the impact of multicollinearity, thereby providing a more robust and assumption-free approach to exploring the associations among HBM constructs. Statistical significance was determined at $p < 0,05$.

Ethical Considerations

This study received ethical approval from the institutional review board of STIKES Wira Medika Bali (Ref no. 403/E1.SSTIKESWIKA/EC/XII/2024). Participants' confidentiality and autonomy were upheld throughout the research process.

RESULTS

Characteristics of Mothers with Toddlers

The majority of mothers were aged 30–34 years (18 individuals, 30 %). Most of them had completed senior high school (26 individuals, 43,3 %). All participants (100 %) reported earning less than IDR 1 600 000 monthly. In terms of occupation, the majority were housewives (45 individuals, 75 %).The detail can be seen in the table 1.

Table 1. Characteristics of Mothers with Toddlers		
Category	**Frequency**	**Percentage (%)**
Age		
20-24 years	10	16,7
25-29 years	16	26,7
30-34 years	18	30,0
35-39 years	14	23,3
40-44 years	1	1,7
45-49 years	1	1,7
Total	60	100
Education		
No schooling	6	10,0
Elementary	13	21,7
Junior High	14	23,3
Senior High	26	43,3
Diploma I	1	1,7
Total	60	100
Income		
< IDR 1,600,000	60	100,0
> IDR 1,600,000	0	0,0
Total	60	100
Occupation		
Entrepreneur	7	11,7
Housewife	45	75,0
Civil/Private Servant	8	13,3
Total	60	100

Table 2. Relationship Between Health Belief Model (HBM) Constructs and Maternal Nutrition Behavior					
HBM Construct	**Category**	**Poor Behavior n (%)**	**Good Behavior n (%)**	**Total n (%)**	**P value**
Perceived Susceptibility	Low	0 (0 %)	0 (0 %)	0 (0 %)	0,135
	Moderate	2 (3 %)	1 (2 %)	3 (5 %)	
	High	15 (25 %)	42 (70 %)	57 (95 %)	
Perceived Severity	Low	0 (0 %)	0 (0 %)	0 (0 %)	0,534
	Moderate	17 (28 %)	42 (70 %)	59 (98 %)	
	High	0 (0 %)	1 (2 %)	1 (2 %)	
Perceived Benefit	Low	12 (20 %)	17 (28 %)	29 (48 %)	0,012
	Moderate	5 (8 %)	16 (27 %)	21 (35 %)	
	High	0 (0 %)	10 (17 %)	10 (17 %)	
Perceived Barriers	Low	8 (13 %)	13 (22 %)	21 (35 %)	0,018
	Moderate	9 (15 %)	14 (23 %)	23 (38 %)	
	High	0 (0 %)	16 (27 %)	16 (27 %)	
Cues to Action	Low	0 (0 %)	0 (0 %)	0 (0 %)	0,534
	Moderate	17 (28 %)	42 (70 %)	59 (98 %)	
	High	0 (0 %)	1 (2 %)	1 (2 %)	
Self-Efficacy	Low	8 (13 %)	9 (15 %)	17 (28 %)	0,000
	Moderate	9 (15 %)	20 (34 %)	29 (49 %)	
	High	0 (0 %)	14 (23 %)	14 (23 %)	

The table 2 shows varying associations between HBM constructs and maternal nutrition behavior. Perceived susceptibility (p = 0,135), perceived severity (p = 0,534), and cues to action (p = 0,534) were not significantly

associated with nutritional behavior. In contrast, perceived benefit (p = 0,012) and perceived barriers (p = 0,018) demonstrated significant associations, indicating that mothers' recognition of the advantages of good nutrition and the obstacles they face influence their parenting behavior. Moreover, self-efficacy (p = 0,000) showed a highly significant relationship, suggesting that confidence in one's ability to practice healthy behaviors strongly predicts maternal nutritional parenting.

DISCUSSION

This study aimed to analyze the relationship between the six components of the Health Belief Model (HBM) and maternal behavior in nutritional parenting for toddlers in Kesimpar Village. The findings revealed that among the six constructs—perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy—only three (perceived benefits, perceived barriers, and self-efficacy) demonstrated a statistically significant relationship with maternal nutrition behavior. This suggests that mothers are more likely to engage in appropriate feeding practices when they recognize the tangible benefits of those actions, feel fewer obstacles to acting, and are confident in their own ability to implement them effectively.

The absence of a significant association for perceived susceptibility and severity is notable. Despite 95 % of mothers scoring high on perceived susceptibility and 98 % scoring moderately on perceived severity, these did not translate into better feeding behaviors. This aligns with previous research, who found that high awareness of risk and perceived seriousness alone were insufficient to influence maternal actions unless accompanied by enabling factors.[14] It indicates that while knowledge of potential risks (e.g., stunting, disease) may be present, such awareness must be supported by practical capacity and psychological readiness to create behavioral change.[20]

Perceived benefits and self-efficacy were particularly influential in shaping behavior. Mothers who believed in the effectiveness of balanced nutrition were more likely to adopt and maintain positive feeding practices. This supports the findings of Laila et al., who identified perceived benefit as a protective factor against child malnutrition.[16] Additionally, mothers who had higher self-efficacy—defined as confidence in their ability to plan, prepare, and provide nutritious food—consistently demonstrated good nutritional parenting. This is consistent with the theoretical foundation of the HBM, which emphasizes self-efficacy as a key driver of preventive health behaviors.

Perceived barriers also showed a significant inverse relationship with feeding behavior. Mothers who perceived fewer challenges—such as time constraints, lack of knowledge, or economic hardship—were more capable of meeting their children's nutritional needs. This is important in resource-limited settings where structural and environmental constraints often undermine health promotion efforts. Health education programs, therefore, must not only raise awareness but also address these barriers directly through supportive services, food assistance, skill-building, and behavior change communication.

Cues to action, such as advice from healthcare providers or media exposure, did not show a significant effect on behavior. This may suggest that external triggers, while helpful, are insufficient unless internal motivation and belief systems are already in place. In line with Glanz et al., cues to action may function more as catalysts than as independent motivators in changing maternal behavior.[17]

In sum, the findings reinforce the value of applying a behavioral model like HBM in understanding and promoting maternal nutrition practices. Interventions should go beyond risk communication to actively enhance perceived benefits, reduce perceived barriers, and cultivate self-efficacy among mothers. Tailored community-based programs that integrate these elements may have a greater impact in reducing child malnutrition and supporting optimal growth and development.[18]

Strengths and limitations

A key strength of this study lies in its application of the Health Belief Model (HBM) as a comprehensive theoretical framework to examine maternal behavior in toddler nutrition. By analyzing six distinct psychosocial constructs—perceived susceptibility, severity, benefits, barriers, cues to action, and self-efficacy—the study provides a nuanced understanding of what drives or hinders mothers in practicing healthy feeding behaviors. The use of validated questionnaires and a complete enumeration (total sampling) of 60 mothers in the target village ensured adequate data quality and contextual relevance. Furthermore, the study offers practical insights for health professionals and policymakers in designing more effective, theory-based nutrition education programs at the community level.

However, the study has several limitations. First, its cross-sectional design restricts causal interpretation, as associations between HBM constructs and behavior are observed at one point in time and may not reflect long-term dynamics. Second, self-reported data may be subject to social desirability bias, with mothers potentially overstating positive behaviors or underreporting challenges. Third, the study was limited to a single rural village in Karangasem, Bali, which may limit the generalizability of the findings to other regions with different socio-cultural or economic profiles. Lastly, while the HBM captures many individual-level psychological factors,

it does not account for broader influences such as cultural norms, family dynamics, or systemic barriers in food access and healthcare infrastructure.[19]

Implications

The findings of this study have several important implications for public health practice, particularly in the prevention of child malnutrition and stunting through improved maternal behavior. First, the significant role of perceived benefits, perceived barriers, and self-efficacy highlights the need for behavior-focused health education programs that go beyond information dissemination. Nutrition interventions should aim to increase mothers' confidence and problem-solving skills in feeding their children, while also reducing structural and psychological barriers. This could include practical cooking demonstrations, peer support groups, and tailored counseling to help mothers navigate economic or time-related constraints.

At the policy level, integrating the Health Belief Model into maternal and child health programs can enhance the effectiveness of existing services such as posyandu (integrated health posts) and antenatal care. Health workers can be trained to assess and address specific HBM dimensions during routine contact with mothers, using motivational interviewing techniques to encourage behavior change. Additionally, community-based strategies that incorporate culturally appropriate cues to action—such as endorsements from local leaders or success stories from peers—may strengthen the reach and impact of nutrition campaigns. Overall, the study supports a shift from generic nutrition messaging toward targeted, evidence-based interventions grounded in behavioral theory.[20]

CONCLUSIONS

This study concludes that maternal behavior in nutritional parenting for toddlers is significantly influenced by three key constructs of the Health Belief Model: perceived benefits, perceived barriers, and self-efficacy. Mothers who recognize the value of balanced nutrition, face fewer perceived obstacles, and feel confident in their ability to feed their children appropriately are more likely to adopt healthy feeding practices. In contrast, perceived susceptibility, perceived severity, and cues to action did not show a significant relationship with maternal behavior, suggesting that awareness alone may not be sufficient to drive change without supportive beliefs and capabilities.

These findings highlight the importance of designing maternal and child health programs that go beyond knowledge transfer to address motivational and structural factors. Interventions should focus on strengthening mothers' confidence, reducing barriers to accessing and preparing nutritious foods, and reinforcing the tangible benefits of healthy nutrition. Applying the Health Belief Model as a guiding framework can enhance the relevance and effectiveness of nutrition-focused behavior change strategies in preventing malnutrition and promoting optimal child growth, particularly in rural and resource-limited communities.

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CONFLICT OF INTEREST
The authors declare that there is no conflict of interest.

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