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ORIGINAL ARTICLE

Risk factors for obesity and overweight in under-five children in a highland community, Kabanjahe

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ABSTRACT

Overnutrition in toddlers is a public health problem that continues to increase globally and nationally. In Indonesia, the prevalence of toddler obesity has risen from 10.5% (2007) to 21.8% (2018). In Karo Regency, the prevalence of toddler obesity reached 8.80%. Data from 2025 at Simpang Empat Community Health Center in Kabanjahe shows 12 toddlers with obesity and 49 toddlers with overnutrition. This study aims to analyze the relationship between maternal knowledge, attitudes, and practices with the occurrence of obesity and overnutrition in toddlers aged 12-60 months. The research method used an observational analytic design with a cross-sectional approach. The sample consisted of 61 toddlers with obesity or overnutrition, selected using total sampling. Data were collected through questionnaires and anthropometric measurements of BMI-for-age. Analysis used the Chi-Square test. Results show the majority of mothers had insufficient knowledge (57.4%), positive attitudes (63.9%), and suboptimal practices (65.6%). There was a significant relationship between knowledge (p=0.038), attitude (p=0.041), and practice (p=0.044) with the toddler's nutritional status. The study conclusion confirms that good nutritional care practices, supported by adequate knowledge and a positive attitude, play an important role in preventing obesity and overnutrition in toddlers.

Keywords: toddler obesity, overnutrition, maternal knowledge, maternal attitude, maternal practice

Introduction

Overweight and obesity in toddlers are a global health concern of increasing alarm. In many cultures, including Indonesia, a chubbier child is often considered a symbol of prosperity, so this condition is not viewed as a health problem. However, research shows that overweight toddlers have long-term risks for metabolic diseases and developmental disorders[1]. Nationally, the 2018 Basic Health Research Report (Riskesdas) shows improvement in indicators for undernutrition and stunting, but the prevalence of toddler obesity instead increased significantly from 10.5% (2007) to 21.8% in 2018[2]. This condition indicates changes in consumption patterns and increased high-calorie eating habits in early childhood.

At the regional level, overnutrition is also a particular concern in North Sumatra. Based on weight-for-height data for toddlers aged 0-59 months, the prevalence of obesity in this province reached 7.88%, with several regencies such as Nias, South Nias, Padang Lawas, Medan, and North Tapanuli showing higher

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prevalence. In Karo Regency itself, the prevalence of toddler obesity reached 8.80% in 2018, with the number of toddlers weighed being 184 children[3].

Overweight in toddlers is influenced by various factors, including dietary patterns, consumption of sugary drinks, low physical activity, family food quality, and biological factors such as birth weight[4–6]. Furthermore, obesity occurs when energy intake exceeds the body's needs, leading to fat accumulation[7]. Children with obesity are also up to 12 times more susceptible to motor development disorders compared to children with normal nutritional status[8].

Preliminary survey data from February 2025 at Simpang Empat Community Health Center in Kabanjahe shows that out of 1,221 toddlers, there were 12 with obesity and 49 with overnutrition, totaling 61 toddlers experiencing overnutrition. A preliminary survey of mothers of obese toddlers showed variations in family economics, but all had suboptimal feeding care practices. This finding indicates the need for an in-depth analysis of maternal behavioral factors, considering that maternal knowledge, attitude, and practice play a crucial role in shaping children's eating patterns and the risk of overnutrition.

Method

This quantitative research used a cross-sectional design aimed at analyzing factors related to obesity and overnutrition in toddlers in the working area of Simpang Empat Community Health Center in Kabanjahe. The research was conducted from April 2025 until completion. The study population was all toddlers with obesity and overnutrition, totaling 61 individuals, who were also taken as the sample using total sampling technique. Inclusion criteria included toddlers aged 12-60 months residing in the health center's working area and having parental consent. Exclusion criteria included toddlers whose parents were unwilling to participate or could not be contacted. Primary data were obtained through questionnaires on maternal knowledge, attitude, and practice, as well as measurements of toddler weight and height to determine nutritional status based on the BMI-for-age indicator according to the Indonesian Ministry of Health (2020) anthropometric standards. Secondary data were obtained from records of the number of toddlers at the health center.

Variable measurement was conducted through a structured questionnaire. Knowledge was measured using "yes" and "no" questions categorized as good, sufficient, and poor. Maternal attitude was measured using a 4-point Likert scale and categorized as positive or negative. Maternal practice was measured based on the frequency of feeding practices and child physical activity, categorized as good and poor. The toddler's nutritional status was determined based on the BMI-for-age standard deviation score. Data processing included editing, coding, cleaning, entry, and tabulation. Univariate analysis was used to observe the frequency distribution of each variable, while bivariate analysis used the Chi-square test. If more than 20% of cells had an expected count <5, Fisher's Exact Test was used. The significance level was set at $p < 0.05$.

Results

The results of this study aim to analyze the relationship between maternal knowledge, attitude, and practice with the occurrence of obesity and overnutrition in toddlers (12-60 months) at Simpang Empat Community Health Center in Kabanjahe. The total respondents in this study were 61 mothers of toddlers with obese and overnutrition status. Univariate analysis was used to describe the frequency distribution of the research variables. The frequency distribution results for respondent characteristics are presented in Table 1.

Table 1. Frequency distribution of respondent and toddler characteristics

Characteristic	Frequency (n)	Percentage (%)
Maternal Age		
≤ 30 years	32	52.5
> 30 years	29	47.5
Maternal Education		
Junior High School	1	1.6
Senior High/Vocational School	50	82
Diploma (D3)	7	11.5
Bachelor (S1)	3	4.9
Maternal Occupation		
Housewife	19	31.1
Farmer	31	50.8
Teacher	4	6.6
Entrepreneur	7	11.5

Monthly Income (IDR)		
≤ 2,500,000	23	37.7
> 2,500,000	38	62.3
Toddler Age & Anthropometry		
1 Year (n=20)		
Height < 70 cm	9	45
Height ≥ 70 cm	11	55
Weight < 10 kg	5	25
Weight ≥ 10 kg	15	75
2 Years (n=19)		
Height < 80 cm	2	10.5
Height ≥ 80 cm	17	89.5
Weight < 13 kg	6	31.6*
Weight ≥ 13 kg	13	68.4*
3 Years (n=9)		
Height < 95 cm	6	66.7
Height ≥ 95 cm	3	33.3
Weight < 17 kg	6	66.7
Weight ≥ 17 kg	3	33.3
4 Years (n=13)		
Height < 100 cm	3	23.1
Height ≥ 100 cm	10	76.9
Weight < 20 kg	7	53.8
Weight ≥ 20 kg	6	46.2
Toddler Sex		
Male	30	49.2
Female	31	50.8

The majority of mother respondents were in the productive age group of 30 years and below at 52.5% (32 individuals). Maternal education level was dominated by Senior High/Vocational School graduates at a very high percentage of 82.0% (50 individuals). Regarding occupation, more than half of the mothers worked as Farmers (50.8%), and economically, most respondents (62.3%) had a monthly income above IDR 2,500,000. Toddler physical characteristics were analyzed according to age groups from one to four years. At 3 years of age, a concerning trend was observed where more than half of toddlers (66.7%) had a height less than 95 cm and weight less than 17 kg, indicating that the majority of toddlers at this age were below the ideal standard based on the criteria used. The distribution of toddlers by sex was almost balanced, with 30 male toddlers (49.2%) and 31 female toddlers (50.8%). The frequency distribution results for independent and dependent variables are presented in Table 2.

Table 2. Frequency distribution of maternal variables and toddler nutritional status

Variable	Frequency (n)	Percentage (%)
Maternal Knowledge		
Good	11	18
Sufficient	15	24.6
Poor	35	57.4
Maternal Attitude		
Positive	39	63.9
Negative	22	36.1
Maternal Practice		
Good	21	34.4
Poor	40	65.6
Toddler Nutritional Status		
Obesity	12	19.7
Overnutrition	49	80.3

The majority of respondents, 57.4% (35 individuals), had a poor level of knowledge regarding toddler nutrition. Although knowledge was low, the majority of respondents demonstrated a positive attitude (63.9%). In terms of practice, most respondents demonstrated suboptimal care practices, reaching 65.6% (40 individuals). Meanwhile, the results of the dependent variable analysis show that the majority of toddlers

experienced overnutrition, with 80.3% in the overnutrition category. The results of the bivariate analysis are presented in Table 3.

Table 3. Relationship between maternal knowledge, attitude, practice and toddler obesity/overnutrition

Variable	Obesity		Overnutrition		Total		p-value
	n	%	n	%	n	%	
Knowledge							
Good	0	0	11	100	11	100	0.038
Sufficient	6	40	9	60	15	100	
Poor	6	17.1	29	82.9	35	100	
Attitude							
Positive	11	28.2	28	71.8	39	100	0.041
Negative	1	4.5	21	95.5	22	100	
Practice							
Good	1	4.8	20	95.2	21	100	0.044
Poor	11	27.5	29	72.5	40	100	

Discussion

This discussion section aims to interpret the significant findings from the bivariate analysis regarding the relationship between maternal knowledge, attitude, practice and the occurrence of obesity and overnutrition in toddlers. The study results show a significant relationship between maternal knowledge and toddler nutritional status (p = 0.038). This finding indicates that mothers with good knowledge tend to have children with overnutrition, whereas obesity occurs more frequently among mothers with sufficient or poor knowledge. Higher education is also associated with better knowledge, as individuals with higher education tend to more easily understand nutritional information [9]. Furthermore, economic factors play a role in the mother's ability to choose healthier foods, as explained by [10] that family economic status determines the quality of food consumed by the child. Maternal occupation also has an influence because social interaction in the workplace allows mothers to obtain new information regarding nutrition [11]. Other information sources such as electronic and print media also contribute to increasing mothers' understanding of how to select good food ingredients for children [12]. Thus, good knowledge enables mothers to implement healthy eating patterns that prevent overweight in toddlers.

The study results show a significant relationship between maternal attitude and toddler nutritional status (p = 0.041). Although the majority of mothers had a positive attitude towards nutrition, obesity still occurred in several toddlers because a positive attitude is not always followed by concrete action. Maternal attitude is strongly influenced by experience, maternal age, and family habits. Indrayani et al. [13] state that mothers with more childcare experience have a more mature attitude regarding child nutrition regulation. This experience makes mothers better understand portion sizes, food variety, and the impact of overconsumption. Furthermore, research by Prasetya [14] shows that a positive attitude is related to the mother's ability to control the child's eating patterns, including the selection of nutritious foods and provision of adequate physical activity. Parenting styles are also influenced by family habits, so even if a mother has a good attitude, her actions may differ if the family does not support it [12]. The environment also shapes maternal attitude. Negative attitudes arise in mothers with minimal experience and knowledge, thus requiring guidance to improve mindset related to nutrition [13]. Additionally, Singkali et al. [15] add that maternal concern for the child's health condition also influences her attitude towards obesity prevention. Thus, although a positive attitude is an initial asset in nutritional care, it must be accompanied by behavioral control and healthy habits to reduce the risk of obesity in toddlers.

This study found a significant relationship between maternal practice and toddler nutritional status (p = 0.044). Maternal practices such as regulating meal portions, limiting sweet foods, and encouraging physical activity significantly influence toddler nutritional status. This aligns with theory [8] which states that practice is the concrete manifestation of knowledge and attitude. However, not all mothers implement appropriate practices. Many mothers have good knowledge but still provide unhealthy food due to reasons of habit, convenience, or child demand. This example is consistent with research [12] which found that inconsistency in regulating family eating patterns, especially consumption of fast food, can increase the risk of obesity in toddlers. Maternal practice is also influenced by occupation and family conditions. Busy parents tend to provide instant or high-sugar food as compensation for lack of time with the child [16]. Furthermore, Fajariyah et al. [17] state that healthy eating practices require the participation of all family members to be implemented consistently. Since obesity occurs due to energy imbalance, practices such as limiting sugary

drink consumption and increasing physical activity are important steps in preventing obesity [7]. Appropriate practices have a direct impact on reducing obesity risk, so educational interventions should focus on changing actual behavior, not just increasing knowledge.

Conclusion

Based on research involving 61 mothers of toddlers at Simpang Empat Community Health Center in Kabanjahe, it can be concluded that there is a significant relationship between toddler nutritional status and maternal knowledge ($p = 0.038$), attitude ($p = 0.041$), and practice ($p = 0.044$). Good nutritional knowledge enables mothers to provide appropriate intake; however, a positive attitude alone is not sufficient to guarantee optimal nutritional status if not followed by concrete action. Mothers who implement good nutritional care practices, such as regulating portions and encouraging physical activity, tend to have children with a more balanced nutritional status and are free from obesity. The suggestions offered are for mothers to actively improve their nutritional knowledge from reliable sources and implement their positive attitudes into concrete actions, such as limiting high-calorie foods and habituating children to be physically active. Community Health Centers are expected to intensify counseling, strengthen growth monitoring, and provide routine nutritional consultations. For future researchers, it is suggested to explore other factors such as family eating patterns and sleep duration, and to use a longitudinal design for long-term monitoring.

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