Original Research

Indonesian mothers' perception about the children nutritional status and its related factors

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Abstract

Background: Nutrition problems are the main public health issues in developing countries, including Indonesia. Malnutrition will lead to failure of physical growth and development of intelligence, decreased work productivity, and reduced endurance resulting in increased rates of pain and death. Therefore, mothers have an essential role in the prevention of nutritional disorders in children.

Objective: To compare the nutritional status of primary school children based on maternal assessment and anthropometry measurements and analyze factors that influence the mother's misperceptions about the nutritional status of the children.

Methods: A cross-sectional research design was used. A total of 96 mothers of elementary school students were included. Quota sampling was used in selecting samples based on population characteristics. Children's nutritional status was classified according to WHO anthropometry standards 2006 for children aged 5-18 years based on age and gender. The mother's perception of the child's nutritional status was measured using an online validated questionnaire (Google Form). Descriptive and bivariate statistics were used for data analysis.

Results: 56.2% of mothers gave an appropriate assessment of the nutritional status of the children. Education and work significantly influenced the accuracy of the mother's perception of their children's nutritional status. A total of 38.4% of mothers with high school education levels misjudged their child's nutritional status compared to those who did not finish high school ($p = 0.058$). Also, 56.3% of non-working mothers were wrong in assessing their child's nutritional status compared to working mothers ($p=0.014$).

Conclusion: The results of this study can be used to improve the knowledge and skills of mothers in assessing the nutritional status of children as one of the strategies to reduce the incidence of malnutrition in children.

Keywords: anthropometry; occupation; maternal assessment; nutritional status; Indonesia

Background

Nutrition is one of the determinants of the quality of human resources (Esther, 2019; Effendy et al., 2020). Nutrition problems are the leading public health problems in Indonesia (Effendy et al., 2015). Malnutrition will lead to failure of physical growth and development of intelligence, decreased work

productivity, and reduced endurance resulting in increased rates of pain and death (Effendy, 2009; Sudirman et al., 2020). Based on national nutritional status monitoring data in 2017 released by the Ministry of Health of the Republic of Indonesia, it is recorded that the malnutrition rate in children aged 5-12 years reached an average value of 7.5% from a total of 34 provinces (Khadijah et al., 2021). According to Badan Litbangkes (2013), there are 19.6% of malnourished toddlers consisting of 5.7% of malnourished toddlers and 13.9% of malnourished, 4.5% of infants with more nutrition. Malnourished toddlers in 2010 consisted of 13.0% of undernourished toddlers and 4.9% of malnourished status. Year-on-year changes in malnutrition results were from 5.4% in 2007, 4.9% in 2010, and 5.7% in 2013. The MDGs target for malnutrition in 2015 is 15.5%" (Tosepu et al., 2016; Sunarsih et al., 2020).

The triggering factors of nutritional problems can vary between regions or between groups of people; even this problem will differ between groups for toddlers. Parenting patterns are the attitudes and behaviors of mothers or other caregivers regarding feeding, hygiene, compassion, and so on. These factors are strongly related to the level of education, knowledge, and family skills (Fajriani et al., 2020).

Nutritional problems are influenced by two factors, directly and indirectly. Direct causative factors are food and infectious diseases suffered by children, malnutrition due to food, and being affected by infectious diseases such as appetite disorders, digestion, and absorption of food in the body. Indirect causal factors are food security in the family, parenting patterns, inadequate health care, and environmental sanitation, of the three causal factors indirectly related to education, knowledge, income, and maternal skills. One of the causes of malnutrition in pre-school children is due to inadequate parenting patterns. Parenting patterns in the form of attitudes and behaviors of mothers or other caregivers in terms of proximity to the child, feeding, care, maintaining cleanliness, providing affection, etc. All of them relate to the mother's condition in terms of health (physical and mental), nutritional status, education, income, knowledge, and skills challenge a good caregiver, role in the family or society, and so on from the mother and caregiver (Julianti, 2017).

Therefore, the study aimed to determine the mother's perception of the nutritional status of elementary school children for the next time compared to the results of the anthropometry examination to assess the accuracy of maternal perception.

Methods

Study Design
This study employed a cross-sectional design. The research was conducted in Southeast Sulawesi, Indonesia, in June 2021.

Participants
The population in this study amounted to 250 mothers of elementary school students in grades 3, 4, and 5. The number of samples was determined using a cross-sectional formula or an estimate of the proportions and results obtained by 96 samples. Quota sampling was used to select the sample.

This study involves the mother of students from grade 3 to grade 5 because, at that level, the average student can read and write while grades 1 and 2, on average, cannot read and write. In addition, grade 6 students conducted national exam activities so that they could not be included in the research.

Instruments and Data Collection
This study used a self-created online questionnaire (using Google Form). The nutritional status of the children was calculated based on an indicator of Body Mass Index (BMI), which is the weight (in kilograms) divided by the square of height (in meters). Child nutritional status was classified according to WHO anthropometry standards 2006 for children aged 5-18 years based on age and gender. The nutritional status of the mother was classified as obese and not obese; therefore, it is pretty easy for the mother to distinguish between obesity and not obesity. The mother's perception of the child's nutritional status was measured through a simple question: "Compared to other children of the same age, is the mother's child included?" Parents choose the answer to three options: skinny, normal, or obese. Determination of child BMI status was measured based on body weight and height.

Differences in the nutritional status of the child based on maternal perception and anthropometry measurements were categorized as: 1) *Underestimation* (assessment of the nutritional status of the child given by the mother is lower than the results of anthropometry measurements); 2)

Correct estimation (assessment of the nutritional status of the child given by the mother is the same as the results of anthropometry measurement), 3) *Overestimation* (assessment of the nutritional status of the child given by the mother is higher than the results of anthropometry measurements.

Maternal sociodemography data were grouped into age, education, occupation, family income, number of children, and nutritional status of the mother. The mother's age was grouped into ≤30 years and >30 years. Maternal education was grouped into low education (not high school/equivalent) and high (high school graduation/equivalent). Mother's work was grouped into working and not yet working. Family income was classified as low (Minimum Wage district/city [UMK] ≤Rp. 2.552.014/month) and high (Minimum Wage [UMK] >Rp. 2.552.014/month). The number of mothers' children was grouped into >2 children and ≤ 2 children. The nutritional status of the mother was classified as obese and not obese.

The researchers also declared that the questionnaires were valid and reliable with the corrected item-total correlation value ≥ 0.30 and Cronbach's alpha > 0.60.

Data Analysis

Microsoft Excel software and SPSS 16.0 were used for data processing and analysis. Univariate analysis was used to present descriptive data using frequency distribution tables or bar charts. Coefficient kappa was used to test the conformity between the suitability of nutritional status based on maternal assessment and anthropometry measurements. The coefficient value of kappa <0.8 indicates if the mother's perception of the child's nutritional status is poor, and the coefficient value of kappa >0.8 indicates the mother's perception of the child's nutritional status is good. Chi-square was used for further analysis.

Results

Table 1 shows that the majority of the mothers aged >30 years (74%), holding high school educational background (73%), having family income less than Rp. 2,552,014/month (66.7%), having less than two children (55.2%), and not having obesity (91.7%). In addition, half of the mothers were both working and not working.

**Table 1** Sociodemographic Characteristics and Nutritional Status of Mothers

Variable	N	%
Age		
<30 years	25	26.0
>30 years	71	74.0
Education		
High school graduation	73	73.0
Not Finished High School	23	24.0
Work		
Working	48	50.0
Not Working	48	50.0
Family Income		
<Rp. 2,552,014/month	64	66.7
>Rp. 2,552,014/month	32	33.3
Number of Children		
<2 children	53	55.2
>2 children	43	44.8
Maternal Nutritional Status		
Obesity	8	8.3
Not Obese	88	91.7

Distribution of the nutritional status of the children based on the perception of the mothers and the results of anthropometry measurements can be seen in Figure 1, which shows a significant difference in the proportion of malnutrition in children based on maternal perception and anthropometry results (32.3%: 70.8%). While in the proportion of obesity both according to maternal perception and anthropometry, results were not much different.

Overall, 56.2% of mothers gave proper assessments of nutritional status in children, and 43.7% of mothers gave incorrect assessments about the nutritional status of children. Figure 2 shows the conformity between the mother's perception of the nutritional status of the child compared to the results of anthropometry measurements. For the group of children with less nutrition, 55.9% of mothers rated their children as having normal nutrition, for the group with normal nutrition, 5% of mothers rated their child as malnourished and obese, then for the obesity group (more nutrition), 25% of mothers rated their child as having normal nutrition. The conformity between the nutritional status of the child according to the perception of the mother and the results of anthropometry shows the value of the coefficient of kappa of ≥ 0.8, which indicates that the mother's perception of the nutritional status of the child was quite good.
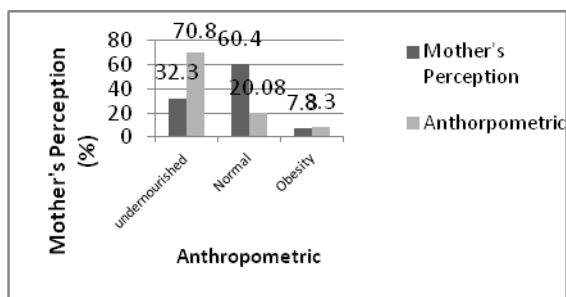
Figure 1 Nutritional Status Based on Anthropometric Measurements and Mother's Assessment
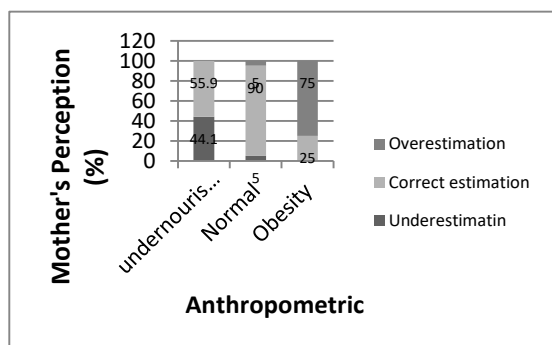
Figure 2 Conformity of Maternal Assessment on Nutritional Status

Table 2 shows that education and work affected the accuracy of the mother's perception of the nutritional status of their child. A total of 38.4% of mothers with high school graduation education levels misjudged their child's nutritional status compared to those who did not finish high school (p=0.058). A total of 56.3% of mothers who did not work were also still wrong in assessing their child's nutritional status compared to working mothers (p=0.014).

Discussion

The results of anthropometry examination in this study showed 8.3% of children were overweight /obese, 70.8% malnutrition, and 20.08% normal nutrition. The results of this research were in line with those carried out in two public elementary schools and one private elementary school in Pekanbaru, Indonesia. Likewise, another research in South Sumatra showed that 10.7% of children were overweight and 3.6% of children were obese (Rahmiwati et al., 2018). This indicates that elementary school-aged children experience poor nutritional status. School-age children with more nutritional status will cause asthma, diabetes, sleep apnea, and cardiovascular disease. The risk of cardiovascular disease in the form of increased total

cholesterol, triglycerides, insulin levels, and increased blood pressure was found in 60% of obese children aged 5-10 years. Furthermore, psychological effects will cause overweight and obese children to be more prone to experiencing low self-esteem, and the increasing prevalence of obesity in children is also predicted to have an impact on decreasing work productivity when they are adults (Oktaria et al., 2020).

This research indicated a discrepancy in the distribution of children's nutritional status based on anthropometric measurements and mother's perceptions. Anthropometric examination showed 8.3% of children were obese, but the mother's perception of her child was on the problem of obesity indicates only 7.3%. Meanwhile, the proportion of children with normal nutritional status was higher based on the mother's assessment than anthropometric measurements, namely 60.4% vs. 20.08%. Based on this data, it shows that the mother's ability to assess the nutritional status of children is still low. Overall, 56.2% of mothers gave correct assessments of the nutritional status of their children, and 43.7% of mothers gave incorrect assessments of their children's nutritional status. Many parents misclassify their child's weight. They may think their child's weight is normal, but it turns out that their child is overweight after an examination. According to Putri et al. research, mothers who are rarely at home or work outside the home have a positive perception of obesity in children as much as 60% of mothers who are rarely at home have the perception that obesity in children is not a problem for children, while mothers who do not work have negative perceptions of obesity. Obesity in children is as much as 40%. Research conducted by Baughcum et al. (2000), shows that mothers with a college education have a negative perception of obesity as much as 57.1% believe that obesity in children will affect children's health, while mothers with secondary education have a positive perception of obesity as much as 52.4% Mothers with a junior high school education believe that obesity in children does not have a serious health problem.

Mother's behavior in child care, especially in providing nutrition, both the type of food and the amount of food is determined by the mother's knowledge of the nutritional needs of the child. A mother's level of nutrition knowledge is essential in improving the nutritional status of the family,

especially the nutritional status of their children, starting from determining, selecting, processing up to serving the daily nutritional menu. Mothers' behavior about health is influenced by several factors, including age, education, social status, culture, and others (Nisak et al., 2018).

Table 2 Sociodemographic and Anthropometric Analysis of Mothers with Appropriateness of Assessment of Children's Nutritional Status

Variable	Inappropriate N (42)		Appropriate N (54)		P	PR	95% CI
	n	%	N	%			
Age							
<30 Years	12	48	13	52	0.618	0.793 ref	0.317-1.797
>30 Years	30	42.3	41	57.7			
Education							
Graduate (High School)	28	38.4	45	61.6	0.058*	2.500 ref	0.956-6.537
Didn't Graduate	14	60.9	9	39.1			
Occupation							
work	15	31.3	33	68.7	0.014*	2.829 ref	1.227-6.521
didn't work	27	56.3	21	43.7			
Family Income							
<Rp. 2.552.014/Month	30	46.9	34	53.1	0.383	0.680 ref	0.285-1.620
>Rp. 2.552.014/Month	12	37.5	20	62.5			
Number of children							
<2 Children	21	39.6	32	60.4	0.365	1.455 ref	0.645-3.279
>2 Children	21	48.8	22	51.1			
Mother's Nutrition Status							
Obesity	4	50	4	50	0.710	0.760 ref	0.179-3.236
Not obesity	38	43.2	50	56.8			

Note: PR=*Prevalence Ratio*; CI=*Confidence Interval*

The mother's behavior in providing nutrition to toddlers is also influenced by the mother's employment status. Working mothers impact the low time together between mothers and toddlers so that mothers' attention to the development of toddlers is reduced. The impact of working mothers also depends on the type of work the mother does. Mothers who have heavy work will experience physical exhaustion, so mothers will tend to choose to rest rather than take care of their children (Nisak et al., 2018). Several factors affect the nutritional status of children, including feeding patterns in children. The busyness of working mothers causes their time to pay attention to their child's development to be hampered. This research shows a relationship between mother's work and the nutritional status of children, where mothers who do not work have a better nutritional status than working mothers (Nisak et al., 2018). Several factors affect the nutritional status of children, including feeding patterns in children. The busyness of working mothers causes their time to pay attention to their child's development to be hampered. This research shows a relationship between mother's work and the nutritional status of

children, where mothers who do not work have a better nutritional status than working mothers (Nisak et al., 2018). Low family income has a strong relationship with the nutritional status of children. This means that the nutritional status of children is strongly influenced by families who have low incomes. Low family income can directly impact the provision of food in the family, where families will experience problems in the availability of food according to their needs so that it can affect and disrupt the nutritional status of children. This means that family income can determine the good or bad nutritional status of children. If the family income is low, the child's nutritional status will be problematic, and vice versa (Wulanta et al., 2019).

There are four ways to assess nutritional status: anthropometric measurements directly, clinical examination; biochemical examination; and biophysical examination (Sari & Ratnawati, 2018). Previous research found a relationship between mothers' knowledge of feeding patterns and the nutritional status of children under five; the lower the mother's knowledge about feeding patterns for

toddlers, the lower the nutritional status of toddlers (Sari & Ratnawati, 2018). Similar to another research, which revealed that the knowledge possessed by the mother is mostly low. There was a significant relationship between mothers' knowledge about nutrition and the nutritional status of children aged 1-3 years (Susanti et al., 2014). In contrast, another research found no significant relationship between mothers' knowledge and nutritional status (Kawengian & Kapantow, 2015). This research also found a significant association between low family income and mother's perception of the nutritional status of children. Of course, the low economic status will have a major impact on the nutritional status of children. With low family income, the availability of nutritious food to be consumed will decrease so that it can affect the nutritional status of children who still really need good nutrition to avoid malnutrition that might occur.

The important thing that can be taken from this research is the importance of increasing mothers' knowledge because they play an important role in monitoring the nutritional status of children. However, most mothers were still wrong in assessing the nutritional status of their children. This can be supported by maternal education, the number of children, and low economic status. In addition, mothers tended to be more worried if their children were malnourished rather than undernourished. Health promotion activities conducted by health workers regarding maternal awareness of the importance of recognizing nutritional disorders in children as early as possible need to be improved to prevent the occurrence of diseases due to malnutrition.

Conclusion

The distribution of nutritional status of children differed between the results of anthropometry examination and maternal. Overall, 43.7% of mothers gave incorrect assessments about the nutritional status of children. This study also showed that education and work significantly affected the mother's perception of her child's nutritional status. 38.4% of mothers with high school graduation education misjudged their child's nutritional status compared to children who did not finish high school. A total of 56.3% of mothers who did not work were also still wrong in assessing their child's nutritional status compared to working mothers. Therefore, it is necessary to improve the knowledge and skills of parents(mothers) in assessing the nutritional status of children as one of the strategies to reduce the incidence of malnutrition in children.

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