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Original article

Prevalence of underweight and overweight among school-aged children and its association with children's sociodemographic and lifestyle in Indonesia



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ABSTRACT

Objectives: Underweight remains a health problem among Indonesian children, and the incidence of overweight continuously increases. This study aims to determine factors associated with underweight and overweight in school-aged children in Indonesia.

Methods: This study is a cross-sectional investigation on parents and children aged 6–13 years in elementary schools in Makassar, Indonesia. The participants included 877 children and their parents. Anthropometric data were obtained using standardized equipment, and sociodemographic and lifestyle data were determined using a questionnaire. The nutritional status of the children was assessed based on the child growth standard prescribed by the WHO.

Results: The prevalence rates of underweight and overweight among the children were 14.5% and 20.4%, respectively. Underweight was more prevalent in boys. Factors such as mother's level of education, having an underweight father, and playing outdoors on weekends for more than 2 h were significantly associated with underweight children. By contrast, mothers with high levels of education, overweight parents, sleeping for less than 9 h, and playing outdoors on weekends for less than 1 h were significantly associated with overweight children.

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Conclusions: The prevalence of underweight and overweight among school-aged children in Makassar, Indonesia is high. These conditions are associated with the sociodemographic characteristics of children and parents, as well as the lifestyle of children. Parental characteristics and children's lifestyle should be considered when planning prevention and intervention programs for underweight or overweight children.

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1. Introduction

The prevalence of underweight decreases, whereas that of overweight increases in Indonesia [1–3]. The National Baseline Health Research found that the prevalence rates of underweight and obesity among school-aged children were 12.1% and 7.95%, respectively, in 2007 [1,2]. The prevalence of underweight slightly decreased to 11.2%, and that of obesity increased to 8.8% in 2013 [3]. Issues related to underweight and overweight can negatively affect the physical growth and psychological development of children [4]. Lack of muscular strength, late maturation, decreased bone density, and low work productivity later in life are possible consequences of underweight [5]. Overweight or obese children show high risks for hypertension, diabetes mellitus type 2, metabolic disorder, and mental disorders [6–8].

Few studies have investigated the risk factors of underweight in school-aged children in Indonesia. Research has mainly focused on underweight children aged below 5 years, whereas the population of school-aged children has been neglected. Studies in other developing countries have revealed that socioeconomic status, poverty, low educational level of parents, knowledge of mothers on nutrition, family income, infectious diseases, and poor housing are risk factors for undernutrition [5,9–11]. In Indonesia, the effect of lifestyle and sociodemographic characteristics on the occurrence of underweight among school-aged children has not yet been investigated.

Although the number of overweight children increases, few researchers have explored this issue. In other developing countries, obesity and overweight among children are influenced by increased caloric intake, reduced physical activity, high socioeconomic status, age, female gender, involvement in a school meal program, and urbanization [12–14]. Data on underweight and overweight cases among school-aged children in Indonesia remain insufficient. Therefore, this study aims to determine the prevalence of underweight and overweight among school-aged children in Indonesia and explore the association between children's weight with their lifestyle and sociodemographic characteristics.

Nurses play a significant role in preventing and providing intervention to children suffering from nutritional problems. To ensure the appropriateness of a treatment, nurses must recognize the characteristics and lifestyles of the children and their families as well as the risk factors of being underweight or overweight among the children. Nurses and other health

professionals can provide intervention to families and children regarding the basic concepts of balanced nutrition and undesirable effect of insufficient nutrition.

2. Methods

2.1. Design

This cross-sectional study was conducted in Makassar from August to November 2014. Makassar is the largest city in eastern Indonesia and one of the fastest growing cities in terms of economy because of the rapid influx of people from other regions. Hence, Makassar could be suitable for studies to provide valuable insights into the effect of development, which is also likely to occur in other big cities in eastern Indonesia.

2.2. Participants

This study included 877 children in grades 1 through 6 (6–13 years old) and their parents, who completed and returned the questionnaire. Makassar comprises 14 districts. One public school was selected to represent two neighboring districts. Therefore, seven public elementary schools were selected from the city. Interviews were used to collect data on food intake of a subsample of the following participating children based on their nutritional status: 43 underweight subjects, 70 normal-weight subjects, and 53 overweight subjects.

2.3. Instruments

Body weight of children was measured with an Omron digital weighing scale (HBF-251). Standing height was measured using microtoise (SECA). Body mass index (BMI) for-age z-scores (BAZs) were calculated using WHO Anthro Plus version 1.0.3 [15]. To determine the nutritional status of children, the Ministry of Health of Indonesia adopted growth standards that correspond to those established by the WHO in 2007; hence, the present study also used these standards to classify the nutritional status of the participating children [1,3,16].

The questionnaire, which consisted of 23 items, was developed to collect information, including child's date of birth, gender, and sociodemographic characteristics as well as weight and height of his/her parents. The questionnaire also contained questions on children's physical activities, sleeping behavior, and other health-related behavior. Items in the

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