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Obesity related factors in school-aged children: A qualitative study

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Abstract

Background: Childhood obesity among school-aged children has become an escalating public health concern in Indonesia. It significantly affects children's physical, mental, and social well-being. Obesity arises from a complex interplay of biological, environmental, behavioral, and parenting-related factors.

Purpose: To examine the contributing factors to obesity in school-aged children.

Method: A qualitative research design was employed using a phenomenological approach. Data were collected through in-depth interviews with five parents of elementary school children (grades 1–6) who had been diagnosed with obesity. Each interview was conducted in one day, with a duration of no more than 30 minutes per Respondent. The data were analyzed through coding and theme identification.

Results: The analysis revealed five primary themes contributing to childhood obesity: a sedentary lifestyle, genetic influences, eating habits and parenting style, frequent consumption of snacks and sugary drinks, and irregular sleep patterns and habits.

Conclusion: Obesity in school-aged children is driven by an interaction of sedentary behavior, unhealthy lifestyle habits, parenting practices, high sugar intake, genetic predisposition, and poor sleep routines. Preventive measures should adopt a holistic approach involving families, schools, and the surrounding environment to instill healthy behaviors from an early age.

Keywords: Causal Factors; Obesity; School-aged Children.

INTRODUCTION

Obesity is a chronic condition characterized by the excessive accumulation of body fat, which can adversely affect overall health (Joisten, Wessely, Prinz, Wiegand, Gohlke, Keiser, Moliterno, Nielinger, Torbahn, Wulff, & Holl, 2024). In children and adolescents, obesity is associated with a range of health complications that may have long-term consequences (Lehmann, Varnaccia, Zeiher, Lange, & Jordan, 2020). Among the psychological impacts are increased risks of depression and anxiety (Carroll, Bice, Roberto, & Prentice, 2022). Furthermore, obesity in childhood may impair cognitive development, as reduced physical activity and creativity—often associated with excess weight—can lead to lower engagement and motivation in daily activities.

Overweight and obesity are defined as abnormal or excessive fat accumulation resulting from an energy imbalance between calorie intake and expenditure (Fitsum, Egata, Demena, & Gebremichael, 2021). Obesity is the result of continuous fat storage within adipose cells, initially causing hypertrophy (cell enlargement), which in turn stimulates hyperplasia (the formation of new fat cells). During infancy and adolescence, the formation of new fat cells tends to be more prominent, while in adulthood, obesity is primarily due to hypertrophy rather than an increase in the number of fat cells (Norberta, 2024). While biological processes such as fat accumulation contribute to obesity, environmental and behavioral factors—especially those shaped within the family context—also play a critical role.

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Family lifestyle development is heavily influenced by parenting approaches. Parental practices are essential in shaping a child's daily habits, including behaviors that affect their nutritional status (Triana, Lestari, Anjani, & Yudiutami, 2020). Parents have a key role in encouraging healthy eating behaviors by providing a well-balanced diet. Nutritious meals—adequately composed of carbohydrates, proteins, vitamins, and minerals—are necessary to meet the child's nutritional needs and support their physical development and immune function (Muriyanti, Asmawati, & Rosidah, 2022).

Parenting patterns affect how children respond to hunger and fullness cues, which influences their risk of developing obesity. Children with less sensitivity to satiety signals are more likely to become obese, making it essential for parents to adopt effective parenting strategies, particularly concerning dietary regulation (Triana et al., 2020). Beyond diet, parents should also encourage regular physical activity in their children (Rahmah, Ardiaria, & Dieny, 2019). Physical activity enables individuals to move freely and is a fundamental aspect of human life (Ilham & Sepdanius, 2020). It plays a vital role in maintaining energy balance and preventing obesity. An energy imbalance—excessive calorie intake and low energy expenditure—leads to fat accumulation. Inactive children often spend long periods in front of screens (e.g., watching TV or playing games), which reduces physical activity and can lead to unhealthy eating behaviors. Increased screen time disrupts sleep cycles and affects hunger-regulating hormones like leptin and ghrelin, encouraging overeating and reduced feelings of fullness (Ekanayake, Salibi, & Tzenios, 2023).

Regular physical activity provides numerous health benefits, especially in children, supporting their growth and development (Jayadilaga Handayani, Fitri, Istiwamah, Rachman, Darlis, & Kas, 2023). It improves bone density, boosts the immune system, and enhances resistance to infections (Anderson & Durstine, 2019). Lack of physical activity increases the risk of obesity, negatively affecting overall health.

Childhood obesity significantly impacts physical, mental, and social well-being. Physically, it raises the risk of chronic diseases like type 2 diabetes, cardiovascular problems, respiratory issues such as sleep apnea, and musculoskeletal disorders due to

excess weight (Moreira, Moreira, da Costa, Castro, & Cotta, 2020). Psychologically, it can lead to low self-esteem, anxiety, and depression, all of which can hinder social interactions and academic performance (Son, 2024).

Globally, obesity-related complications contribute to approximately 2.8 million deaths annually (Sitorus, Mayulu, & Wantania, 2020). In Indonesia—a country with diverse ethnic groups and lifestyles—obesity remains prevalent and is part of Asia's "triple burden" of disease (Fitri, Sari, & Lipoeto, 2024). According to the 2022 Indonesian Nutrition Status Survey (SSGI), 9.2% of children aged 5–12 years were obese, meaning roughly 1 in 5 children is affected (Ministry of Health of the Republic of Indonesia, 2023).

In West Java, childhood obesity continues to rise. In 2018, the province ranked 12th nationally with a 9.6% prevalence. In Bandung, the rate was 7.95% in 2021 (around 909 cases), rising to 1,346 cases, with Arcamanik Health Center recording 131—second highest in the city (Health Office of Bandung Municipality, 2025). These figures highlight the urgent need for comprehensive prevention and intervention strategies.

A study conducted in the Arcamanik region, targeting 100 elementary and Islamic elementary school students, aimed to identify contributing factors to obesity among school-aged children. Findings indicate that urban residency, having obese fathers, and increasing age raise obesity risk. Ethnicity also played a role—Javanese and Chinese children showed a higher tendency toward excess weight. Children engaged in sedentary behavior for more than two hours daily and who regularly consumed sweet foods were more likely to be overweight (Oktaviani, Mizutani, Nishide, & Tanimura, 2023; Moreira et al., 2020).

The focus of this study is the issue of obesity in school-aged children, which constitutes a significant public health concern. Previous research has identified several factors that may contribute to obesity; however, an in-depth analysis specifically examining the contributing factors to obesity in school-aged children remains limited. Therefore, the researcher is motivated to conduct further investigation to analyze and identify the factors that may lead to obesity in this age group.

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RESEARCH METHOD

A qualitative approach was selected to gain an in-depth understanding of the phenomenon of obesity in school-aged children by exploring various contributing factors such as demographic data, physical activity patterns, genetic factors, dietary habits, snack and beverage consumption patterns, as well as cultural and genetic influences.

A qualitative approach with purposive sampling was applied as the technique for selecting informants. Informants were deliberately chosen based on specific criteria to ensure that they could provide relevant and in-depth information about the phenomenon under investigation. The primary informants in this study were parents of school-aged children (grades 1 to 6) who had been diagnosed as overweight or obese based on the Body Mass Index-for-Age (BMI/Age) classification, in accordance with the Indonesian Ministry of Health Regulation No. 2 of 2020 on Child Anthropometric Standards.

The inclusion criteria for informants were as follows: Parents of school-aged children (grades 1–6); Children identified as overweight or obese based on anthropometric measurements; Parents/guardians who were willing to participate and able to provide open and detailed information through in-depth interviews; and Residents of the Arcamanik area.

During the preparatory phase, the researcher conducted a preliminary study and selected Arcamanik as the research site due to its status as

the area with the highest obesity rate in Bandung City. After obtaining permission from relevant authorities, participants were selected based on the inclusion criteria and asked to complete an informed consent form. During the data collection phase, the researcher conducted Body Mass Index (BMI) measurements and structured interviews with the parents of the selected participants. In the final phase, the data obtained were processed and analyzed to generate findings relevant to the research focus.

Data analysis in this study was conducted in three stages: Data triangulation, which involved selecting, focusing, simplifying, abstracting, and transforming the results of the interviews; Data presentation, which entailed organizing and displaying evidence in a structured and coherent manner to support interpretation and action; Conclusion drawing and verification, a process that involved identifying meanings, noting patterns and consistencies, interpreting the findings, constructing causal relationships, and formulating propositions from the beginning of data collection.

This research was approved by the Health Research Ethics Committee of the Faculty of Health Sciences and Technology, Universitas Jenderal Achmad Yani Cimahi, under approval number 073/KEPK/FITKes-Unjani/V/2025, dated May 24, 2025.

RESEARCH RESULTS

Table Characteristics of the Informants

Child's Initials	Age	Gender	Birth Order	Weight(kg)/ Height(cm)	BMI/U	Parents' Education	Parent's Income
AT	9 years 2 months	Male	2	58/143	6.45 (Obesity)	Bachelor	-
D	7 years 8 months	Male	2	36/123	4.84 (Obesity)	Bachelor	± 6,000,000
AR	8 years 7 months	Female	2	49/133	7.43 kg (Obesity)	High School	± 1,000,000
AL	8 years 10 months	Male	1	52/145	4.86 kg (Obesity)	Bachelor	± 5,000,000
AA	10 years 11 months	Male	3	75/150	7.47 kg (Obesity)	Diploma	± 5,000,000

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The table indicates that all five informants are children aged between 7 years and 8 months to 10 years and 11 months, with the majority being male. All participants are classified as obese according to their BMI-for-age scores, which range from 4.84 to 7.47. Most of the children are the second-born in their families. In terms of parental educational background, the majority of parents hold a Bachelor's degree, while a smaller number have completed high school or possess an associate degree. Reported monthly household income ranges from approximately IDR 1,000,000 to IDR 6,000,000, although income data for one informant is unavailable.

Following data analysis, several key themes were identified as contributing factors to childhood obesity in school-aged children. These themes include: (1) a sedentary lifestyle, (2) genetic predisposition, (3) dietary habits and physical activity patterns, (4) unstructured consumption of snacks and sugary beverages, and (5) sleep routines and pre-sleep activities.

The analysis derived from interview data suggests a strong association between sedentary behavior and unhealthy lifestyle habits among school-aged children. This is characterized by a predominant tendency to spend extended periods engaged in sedentary activities, particularly the use of electronic devices. Most informants reported that the children lack sufficient physical activity and engage in exercise only infrequently. This observation is supported by the following statement from one of the informants:

"Mostly just sits around watching stuff. Works out maybe two or three times a week... usually only goes up and down the stairs when they really have to." (P1).

"Plays games a lot. Works out about three times a week on the treadmill since they have one at home... but still spends way too much time just sitting and playing." (P5)

Genetic factors play a significant role in increasing the risk of obesity in children at school. Most informants disclose a history of suffering from family excess weight or obesity. This is supported by the statement from one of the informant:

"Yeah, Abi." (P1)

"Yes, from his late father. His older brother is the same—also overweight." (P3)

"Yes, from his grandmother. I used to be overweight too." (P4)

Poor dietary habits, combined with inadequate supervision and lack of support for a healthy lifestyle, have been shown to be contributing factors in the development of obesity among children:

"No breakfast at home now because there's a free meal program at school... and honestly, I'm just too lazy to cook, so if he eats at home, it's usually things like nuggets or sausages." (P3)

"No breakfast at home either... because of the free meal program. When it comes to vegetables, it's always the same. If I serve certain vegetables, my child won't eat them... at school, he prefers snacks like crab sticks." (P4)

"For meals, it's usually chicken, beef, or eggs... he only eats vegetables about once a week. As for fruit, he prefers it made into juice." (P5)

Data analysis indicates that the habit of consuming snacks while engaging in other activities—such as watching television, using mobile phones, or playing video games—reduces children's attention to the amount and type of food consumed. Additionally, the frequent intake of sugary snacks and beverages with added sugars has been shown to contribute to weight gain in children. This is supported by the statement of the informant:

"When snacking, it's usually while watching TV, just sitting back and relaxing... then sitting again, playing on the phone or laptop." (P1)

"Snacking while playing on the phone... sometimes it takes a long time to finish eating because he's not focused on the food... drinks sweetened beverages like bottled tea about four times a week." (P2)

"When he snacks, it's often while watching TV or playing on his phone... usually snacks like chips... and if I'm too lazy to cook, he just prefers carton milk." (P3)

"He usually snacks while watching TV or playing on his phone... the environment is quiet... snacks at home are things like biscuits or sometimes chips... nuggets and sausages are used as side dishes... he really likes milk... and at school, he snacks on crab sticks." (P4)

"He mostly snacks while playing games... eats nuggets and sausages... we keep about five packs of Indomie and he finishes them all in a week... just like before, he mostly enjoys avocado juice." (P5)

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This study also examined children's sleep habits and pre-sleep activities, which are believed to significantly impact obesity in school-aged children. Interviews with parents revealed various unhealthy sleep patterns, including insufficient sleep duration and frequent late-night habits. Additionally, behaviors such as eating snacks or using electronic devices before bedtime were found to further disrupt children's sleep quality and routines.

"He rarely takes naps... usually goes to bed around 9:00 or 9:30 p.m., and gets about 8 hours of sleep at night." (P1)

"Naps are pretty rare... he gets about 8 hours of sleep at night." (P4)

"His sleep is kind of irregular... no consistent sleep schedule. He usually eats before bed, and always plays games first... he only wants to sleep once he's tired from playing. It's like he gets worn out just from gaming all day." (P5)

DISCUSSION

Based on the informants' characteristics, all children involved in the study demonstrated indications of obesity, with BMI-for-age (BMI/U) values ranging from 4.84 to 7.47. These values fall within the obesity category according to the Indonesian Ministry of Health Regulation No. 2 of 2020 on Child Anthropometric Standards, which classifies children with a BMI/U greater than +2 standard deviations as obese. The children were aged between 7 and 11 years, with several identified as the second-born in their families.

A more permissive parenting style tends to be observed with second-born children compared to first-borns, which may contribute to less structured routines around eating and physical activity. Although most parents in this study had attained higher education levels (bachelor's or diploma degrees), childhood obesity was still prevalent. This suggests that parenting patterns and lifestyle behaviors may play a more significant role than nutritional knowledge alone.

Furthermore, despite variations in household income, ranging from approximately IDR 1,000,000 to IDR 6,000,000, obesity was present among children from both lower- and higher-income families. This indicates that environmental factors, caregiving practices, and unhealthy dietary habits collectively contribute to the incidence of obesity among children, regardless of socioeconomic status.

A significant factor contributing to childhood obesity within the school environment is the adoption of a sedentary lifestyle, commonly reflected in children's excessive use of electronic devices. This inactive way of living is characterized by minimal physical movement and is often attributed to increased reliance on technology and prolonged periods of sitting (Paraschiv, 2024). Sedentary behaviors, such as extended screen time and a preference for indoor gaming over outdoor activities, have been shown to be associated with the onset of obesity (Shah, Shah, Hussain, Shah, Hamayun, & Roz, 2019). In response to this issue, it is essential for parents to promote daily physical activity and actively limit children's engagement in sedentary activities such as gaming and television viewing.

Genetic factors play a substantial role in elevating the risk of obesity among school-aged children. Interview findings revealed that many of the children studied come from families with a history of obesity. Research suggests that children with obese parents are more likely to develop obesity themselves due to hereditary influences (Lubis, Hermawan, Febriani, & Farich, 2020). This aligns with the thrifty gene hypothesis, which proposes that genes once advantageous for storing energy during periods of food scarcity have become maladaptive in modern environments characterized by abundant food availability, thereby increasing the risk of obesity (Neel, 1962). Genetic contributions to obesity are estimated to account for approximately 40–70% of cases, underscoring the significant role of heredity in the development of this condition (Bouchard, 1994).

While genetic factors are non-modifiable, environmental and behavioral factors can be addressed to prevent or manage obesity. Consequently, educating children—particularly those with a family history of obesity—about healthy dietary habits and the importance of regular physical activity is essential in efforts to prevent the onset of obesity.

Irregular and unhealthy eating habits, along with insufficient support in promoting a healthy lifestyle, have been identified as significant contributors to childhood obesity. Most respondents reported engaging in poor dietary practices. There is a well-established connection between eating behaviors and the incidence of obesity among school-aged children (Dungga, 2020). Children who frequently consume high-fat foods and fast food in excessive

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quantities are at an increased risk of becoming obese.

Parents who allow children unrestricted freedom in food choices or fail to establish clear dietary boundaries may inadvertently increase the risk of obesity in their children. In contrast, effective caregiving—characterized by balanced supervision and the promotion of healthy eating habits—can play a protective role against obesity (Triana et al., 2020). Permissive parenting, which is marked by high warmth but low regulation and oversight, particularly during meals, has been linked to higher obesity risk in children (Baumrind, 1967). Therefore, promoting an authoritative parenting style, which balances warmth with consistent guidance, is strongly recommended for addressing childhood obesity.

Parents hold a critical role in shaping children's dietary behaviors. Adopting healthy eating practices—such as regularly preparing nutritious meals and encouraging breakfast with foods that support weight management—can significantly reduce obesity risk in children.

Frequent consumption of sugary snacks and beverages has also been closely associated with obesity. Interview findings revealed that children often consume such foods while engaging in sedentary activities like gaming or watching television. This behavior is consistent with prior research indicating that excessive intake of snacks and sugar-sweetened beverages is a major contributor to weight gain among school-aged children (Malik & Hu, 2022). Similarly, dietary patterns characterized by high-calorie foods and sweetened beverages, including sodas and packaged soft drinks, are directly linked to an increased likelihood of obesity in this population (Jakobsen, Brader, & Bruun, 2023).

To address this issue, it is important to promote awareness about the risks associated with excessive consumption of high-sugar foods and drinks. Educating children and caregivers about healthy dietary choices can help mitigate this risk.

Irregular sleep patterns and pre-sleep behaviors—such as late-night snacking and excessive use of electronic devices—have been identified as contributing factors to the increased risk of obesity in children. Establishing consistent bedtime routines and minimizing stimulating activities before sleep are essential strategies for preventing obesity. Insufficient sleep can disrupt the hormonal

balance that regulates hunger and satiety, particularly hormones such as leptin and ghrelin. An imbalance in these hormones can lead to increased appetite and reduced feelings of fullness, thereby promoting overeating and contributing to weight gain in children (Hsieh, Sindhu, Dewi, & Sidhiarta, 2023).

Moreover, the use of electronic devices before bedtime—a common habit among children—can negatively affect sleep quality. Exposure to blue light emitted from screens suppresses melatonin production, a hormone crucial for regulating the sleep-wake cycle, thereby interfering with the ability to fall asleep (Richter, Patel, Babu, Wang, & Geeth, 2024). Poor sleep quality, in turn, is associated with metabolic disruptions that can lead to increased body fat and a heightened risk of obesity (Calcaterra, Rossi, Tagi, Baldassarre, Grazi, Taranto, & Zuccotti, 2023). Encouraging children to maintain a consistent sleep schedule and limiting screen time before bed are vital measures for supporting their overall health and reducing the likelihood of obesity.

CONCLUSION

The study identified five primary themes contributing to the occurrence of obesity among school-aged children. These include lifestyle behaviors, genetic predispositions, eating and caregiving patterns, habitual consumption of snacks and sugary beverages, as well as sleep habits and pre-sleep activities. The findings also indicate that obesity affects children across various socioeconomic backgrounds and parental education levels, suggesting that the key determinants are more closely linked to parenting practices, daily lifestyle habits, and eating behaviors rather than solely nutritional knowledge. Consequently, effective obesity prevention in school-aged children requires a holistic approach that encompasses behavioral modification, increased physical activity, regulation of sleep patterns, and active parental involvement in shaping the child's daily lifestyle.

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