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Original Article

Association of parental feeding style and screen time with overnutrition among toddlers aged 12–36 months: a case–control study

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A B S T R A C T

Background: Early childhood malnutrition, particularly overnutrition, is an increasing public health concern influenced by behavioral factors such as parental feeding style and children's screen time. However, studies examining the combined role of these factors among toddlers remain limited.

Objective: To analyze the association of parental feeding style and screen time with overnutrition among toddlers aged 12–36 months.

Methods: A case–control study was conducted among 66 toddlers, comprising 33 children with overnutrition and 33 with normal nutritional status. Data were collected using structured questionnaires assessing parental feeding style and screen time. Nutritional status was determined using the weight-for-height (W/H) index based on WHO standards. Associations were analyzed using the Chi-square test, and odds ratios (ORs) with 95% confidence intervals were calculated. Statistical significance was set at $p<0.05$.

Results: Democratic feeding style showed a protective association with overnutrition (OR=0.12; $p<0.001$), whereas permissive feeding style increased the risk (OR=5.81; $p=0.021$). Authoritarian feeding style showed increased odds but was not statistically significant ($p=0.105$). Screen time and its duration were significantly associated with overnutrition ($p=0.039$ and $p=0.028$, respectively). Negative parental perceptions of screen time were associated with lower odds of overnutrition (OR=0.28; $p=0.013$).

Conclusion: Parental feeding style and screen time are significantly associated with overnutrition among toddlers aged 12–36 months. Interventions should focus on promoting responsive feeding practices and appropriate screen time management to support optimal child growth.

INTRODUCTION

Early childhood (0–5 years) is a critical developmental period often referred to as the "golden age," characterized by rapid physical growth, neurological maturation, and behavioral development. Adequate nutrition during this stage is essential to support optimal cognitive function, immune competence, and long-term metabolic health. Conversely, both undernutrition and overnutrition may lead to adverse outcomes such as impaired growth, developmental delays, and an increased risk of non-communicable diseases later in life.[1-5]

Indonesia is currently facing a triple burden of malnutrition, including stunting, wasting, and overnutrition among children under five.[6] National data indicate an increasing trend of overweight in early childhood, reflecting a growing public health concern that requires attention to modifiable behavioral determinants.[7] Child nutritional outcomes are influenced by direct factors such as dietary intake and morbidity, as well as indirect factors including parenting practices, socioeconomic conditions, and environmental influences.[8]

According to Blum's health field concept, behavioral factors play a central role in determining health outcomes.[9] One important behavioral determinant is parental feeding style, which shapes children's eating behavior, appetite regulation, and dietary patterns. Responsive feeding practices are associated with healthier eating behaviors, whereas non-responsive approaches, such as permissive and authoritarian styles, may contribute to poor self-

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regulation of food intake and an increased risk of overnutrition.[10]

In parallel, rapid digitalization has increased young children's exposure to digital devices. Globally, approximately 40% of children under five are exposed to digital media, reflecting changes in caregiving environments.[11] Excessive screen time is associated with sedentary behavior, distracted eating, and higher consumption of energy-dense foods, which may contribute to overnutrition.[12,13] The World Health Organization recommends limiting screen exposure in children under five to less than one hour per day.[14]

Early-life overnutrition is associated with long-term metabolic consequences, including metabolic syndrome, diabetes mellitus, and cardiovascular diseases.[15] Therefore, early preventive strategies are essential to ensure optimal growth trajectories and reduce future disease burden.[16,17] Although national programs such as infant and young child feeding have been implemented, gaps remain in parental knowledge, feeding practices, and digital parenting behaviors.[18]

Although previous studies have examined parental feeding style and screen time separately, evidence regarding their combined influence on overnutrition remains limited, particularly in low- and middle-income settings. Furthermore, studies focusing on toddlers aged 12–36 months are still scarce, despite this period being critical for the development of eating behaviors and self-regulation. Therefore, this study aims to analyze the association of parental feeding style and screen time with overnutrition among toddlers aged 12–36 months.

METHOD

This study employed an analytical observational design using a case–control design.[19]

Setting and Respondents

This study was conducted in the working area of Jagir Health Center, Surabaya, East Java, Indonesia, from December 2024 to February 2025. The study population consisted of mothers or primary caregivers who had children aged 12–36 months. The sample included 66 respondents, comprising 33 children with overnutrition (case group) and 33 children with normal nutritional status (control group).

The inclusion criteria were mothers or primary caregivers of children aged 12–36 months who were willing to participate and provided informed consent. The exclusion criteria included children with congenital disorders affecting growth or metabolism and respondents with incomplete questionnaire data. Sampling was conducted using purposive sampling based on predetermined inclusion and exclusion criteria.

The Variable, *Instrument*, *and Measurement*

The independent variables were parental feeding style and screen time (frequency, duration, and parental perception), while the dependent variable was overnutrition status based on the weight-for-height (W/H) index. Overnutrition was defined as a weight-for-height Z-score > +2 SD according to WHO Child Growth Standards.

Data were collected using a structured questionnaire consisting of demographic characteristics, parental feeding style, and screen time. The questionnaire was adapted from previously validated instruments and tested for reliability prior to data collection. Parenting style was categorized into authoritarian, democratic (authoritative), and permissive based on Baumrind's parenting theory. Screen time was assessed according to frequency, duration (<1 hour, 1–2 hours, >2 hours per day), and parental perception (positive or negative).

Children's nutritional status was determined through anthropometric measurements of weight and height using standardized digital scales and stadiometers. Measurements were conducted by trained health personnel using calibrated instruments and interpreted using WHO Child Growth Standards.

Data Analysis

Descriptive analysis was used to present respondent characteristics. The Chi-square test was employed to assess associations between categorical variables. Odds ratios (ORs) with 95% confidence intervals (CIs) were calculated to estimate the strength of associations. A p-value < 0.05 was considered statistically significant. Fisher's exact test was applied when Chi-square assumptions were not met. Data were checked for completeness and consistency prior to analysis.

Ethical Consideration

This study received ethical approval from the Faculty of Health Sciences, Universitas Muhammadiyah Surabaya, under Ethics Number: 179/KEPK/F/I/FIK/2025.

RESULTS

Participant Characteristics

The characteristics of participants are presented in Table 1. The distribution of demographic variables was generally comparable between the overnutrition and normal groups. However, differences were observed in parental feeding styles, with democratic feeding more frequently reported in the normal group, while authoritarian and permissive styles were more prevalent among children with overnutrition. A statistically significant association was identified between parental feeding style and overnutrition (p=0.003).

Parental Feeding Style and Overnutrition

As shown in Table 2, children exposed to authoritarian parenting had higher odds of overnutrition; however, the-

Table 1. Characteristics of Participants (n = 66)

Characteristics	Overnutrition (n=33)	Normal (n=33)
Gender		
Male	17 (51.5%)	22 (66.7%)
Female	16 (48.5%)	11 (33.3%)
Child's age		
12 months	1 (3.0%)	1 (3.0%)
13–24 months	16 (48.5%)	14 (42.4%)
25–36 months	16 (48.5%)	18 (54.5%)
Birth order		
First child	16 (48.5%)	14 (42.4%)
2–3 children	16 (48.5%)	16 (48.5%)
≥4 children	1 (3.0%)	3 (9.1%)
Mother's age		
20–30 years	12 (36.4%)	19 (57.6%)
31–40 years	11 (33.3%)	9 (27.3%)
41–50 years	4 (12.1%)	3 (9.1%)
>50 years	6 (18.2%)	2 (6.1%)
Relationship with child		
Mother	19 (57.6%)	25 (75.8%)
Other caregiver	14 (42.4%)	8 (24.2%)
Education level		
Elementary–Junior High	8 (24.2%)	6 (18.2%)
Senior High School	16 (48.5%)	22 (66.7%)
College	9 (27.3%)	5 (15.2%)
Employment status		
Working	9 (27.3%)	9 (27.3%)
Not working	24 (72.7%)	24 (72.7%)
Family income		
<Minimum wage	17 (51.5%)	23 (69.7%)
≥Minimum wage	16 (48.5%)	10 (30.3%)
Family type		
Nuclear	24 (72.7%)	22 (66.7%)
Extended	9 (27.3%)	11 (33.3%)
Parental feeding style		
Authoritarian	6 (18.2%)	1 (3.0%)
Democratic	18 (54.5%)	30 (90.9%)
Permissive	9 (27.3%)	2 (6.1%)

association was not statistically significant (OR=7.11; p=0.105). In contrast, democratic parenting was significantly associated with lower odds of overnutrition (OR=0.12; p<0.001), indicating a protective effect. Permissive parenting was significantly associated with increased odds of overnutrition (OR=5.81; p=0.021).

Table 2. Parental Feeding Style and Overnutrition

Parenting style	Overnutrition (%)	Normal (%)	OR (95% CI)	*p-value*
Authoritarian				
Yes	6 (18.2%)	1 (3.0%)	7.11 (0.80–62.79)	0.105
No	27 (81.8%)	32 (97.0%)	–	–
Democratic				
Yes	18 (54.5%)	30 (90.9%)	0.12 (0.03–0.47)	<0.001
No	15 (45.5%)	3 (9.1%)	–	–
Permissive				
Yes	9 (27.3%)	2 (6.1%)	5.81 (1.15–29.43)	0.021
No	24 (72.7%)	31 (93.9%)	–	–

Screen Time and Overnutrition

Table 3 shows that screen time was significantly associated with overnutrition (p=0.039). The duration of screen time was also significantly associated with overnutrition (p=0.028). In addition, negative parental perceptions of screen time were associated with lower odds of overnutrition (OR=0.28; p=0.013).

Table 3. Screen Time and Overnutrition

Variable	Overnutrition (%)	Normal (%)	OR (95% CI)	*p-value*
Screen time exposure				
Yes	31 (93.9%)	25 (75.8%)	0.20 (0.04–1.04)	0.039
No	2 (6.1%)	8 (24.2%)	–	–
Duration of screen time				
<1 hour/day	26 (78.8%)	16 (48.5%)	–	0.028
1–2 hours/day	5 (15.2%)	9 (27.3%)	–	–
>2 hours/day	2 (6.1%)	8 (24.2%)	–	–
Parental perception				
Negative	20 (60.6%)	10 (30.3%)	0.28 (0.10–0.78)	0.013
Positive	13 (39.4%)	23 (69.7%)	–	–

DISCUSSION

This study demonstrates that parental feeding style and screen time are significantly associated with overnutrition among toddlers aged 12–36 months. Democratic feeding was strongly associated with lower odds of overnutrition (OR=0.12), suggesting a substantial protective effect. In contrast, permissive parenting significantly increased the risk of overnutrition (OR=5.81), highlighting the importance of structured feeding practices in early childhood.

Democratic feeding may promote healthier weight outcomes by supporting children's ability to regulate food intake based on internal hunger and satiety cues.[20] This responsive approach encourages self-regulation and reduces the likelihood of overeating. In contrast, permissive parenting, characterized by limited structure and low behavioral control, may lead to uncontrolled eating behaviors and excessive caloric intake, thereby increasing the risk of overnutrition.

Screen time may contribute to overnutrition through multiple behavioral pathways. Exposure to screens during meals can reduce children's attention to satiety signals and promote distracted eating, leading to increased energy intake. Additionally, excessive screen time may displace physical activity and reduce overall energy expenditure. These mechanisms are consistent with ecological models of child health, which emphasize the interaction between environmental exposures and family behaviors in shaping health outcomes. A systematic review by Stiglic and Viner also reported that increased screen time is associated with higher adiposity and unhealthy dietary behaviors among children.[21]

The findings may also indicate a potential interaction between permissive feeding and screen exposure. Limited

parental regulation during meals, combined with concurrent screen use, may create unstructured eating environments that reduce satiety awareness and promote excessive intake.[22] Conversely, structured feeding practices alongside controlled screen exposure may support more regulated eating behaviors.[23,24] However, this interaction was not formally tested in the present study and should be interpreted with caution.

Interestingly, authoritarian feeding showed higher odds of overnutrition, although the association was not statistically significant. This finding may reflect variability in how authoritarian practices are implemented across cultural contexts, as well as differences in children's behavioral responses.[31] Such inconsistencies suggest that the relationship between authoritarian parenting and child weight outcomes may be influenced by contextual and individual factors.

Socioeconomic and contextual factors may further influence these relationships. Limited parental education, economic constraints, and caregiver stress may reduce the capacity to implement responsive feeding practices and to consistently regulate children's screen time. These conditions may also increase reliance on digital devices as a behavioral management strategy and facilitate access to energy-dense foods. Therefore, parenting practices are shaped not only by individual knowledge but also by broader structural and environmental determinants.[25–29] These findings are consistent with previous studies reporting that authoritative feeding is associated with healthier weight outcomes, whereas permissive parenting and excessive screen time are linked to an increased risk of childhood obesity.[31,32]

This study has several limitations. The case–control design limits causal inference, as temporal relationships between parental feeding practices, screen time, and overnutrition cannot be fully established. Data on parenting practices and screen time were self-reported, which may introduce recall and social desirability bias. In addition, the relatively small sample size and single-center setting may limit the generalizability of the findings.

Despite these limitations, the findings highlight the importance of integrated interventions that combine nutrition education with digital parenting literacy. Health professionals should incorporate counseling on responsive feeding practices and appropriate screen time regulation into routine child health services. Strategies such as implementing screen-free mealtimes and promoting structured feeding approaches may help support healthier eating behaviors and prevent early childhood overnutrition.

CONCLUSIONS AND RECOMMENDATION

Parental feeding style and screen time are significantly associated with overnutrition among children aged 12–36 months. Democratic feeding practices appear to have a strong protective effect, while permissive parenting and excessive screen exposure increase the risk of overnutrition. These findings highlight the importance of integrating responsive feeding education with screen time management strategies in early childhood health programs. Health professionals should incorporate counseling on structured feeding practices and screen-free mealtime routines into primary healthcare services. Future research is recommended to employ longitudinal designs and include objective measurements of dietary intake and physical activity to better clarify causal relationships.

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