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INTRODUCTION

Preschoolers (3–6 years old) are in a physically and socially active phase and often forget mealtimes because they are

engrossed in playing (1). This condition puts children at risk of nutritional deficiencies (2). To overcome difficulty in eating, some parents give gadgets so that their children want to eat (3). However, this habit can

THE RELATIONSHIP BETWEEN GADGET ADDICTION AND FEEDING PRACTICES AND NUTRITIONAL STATUS OF PRESCHOOL-AGE CHILDREN

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ABSTRACT

Introduction: The nutritional well-being of preschool children is affected by parental influences, such as feeding habits and the use of gadgets to distract during meals. This study aimed to examine the link between gadget addiction and feeding habits, as well as the connection between gadget addiction and the nutritional status of preschoolers. **Method:** This correlational study employed a cross-sectional approach, involving 210 mother-child pairs from five villages in Karangbinangun District, Lamongan Regency. A total of 125 pairs were chosen using stratified random sampling. Gadget addiction and feeding habits were the independent variables, while nutritional status (weight-for-age and height-for-age) was the dependent variable. This study used a gadget addiction questionnaire, the Child Feeding Questionnaire (CFQ), weight scales, and a microtoise. Data analysis was conducted using descriptive statistics and Spearman's correlation test, with a significance threshold of $p \leq 0.05$. **Results:** There was no significant link between gadget addiction and feeding habits ($p = 0.474$; $r = -0.065$). Similarly, no association was found between gadget addiction and nutritional status based on weight-for-age ($p = 0.131$; $r = -0.136$) or height-for-age ($p = 0.722$; $r = 0.032$). Most children with minimal gadget use demonstrated suitable feeding habits and normal nutritional status. **Discussion:** The lack of significant associations suggests that low-to-moderate gadget use does not affect feeding habits or nutritional outcomes. Environmental and familial factors other than gadget exposure may influence the nutritional status of children. These results highlight the importance of educating parents on proper gadget use, responsive feeding practices, and regular growth monitoring.

Keywords: Feeding Practices; Gadget Addiction; Nutritional Status; Preschool

cause gadget addiction, so that children become accustomed to eating while staring at the screen and lose control of hunger and fullness (4). Therefore, an analysis of the relationship between gadget addiction, feeding practices, and nutritional status in preschool-aged children is needed.

A survey by the Indonesian Internet Service Providers Association (APJII) in 2017 showed that 54.68% of the Indonesian population uses the Internet with gadgets as the main device (44.16%). Excessive gadget use, especially during meals, can interfere with hunger and satiety cues and increase the risk of obesity (5), contributing to chronic diseases such as asthma and diabetes (5). The American Academy of Pediatrics (AAP) recommends limiting gadget use to less than one hour per day for children aged 2–5 years (6); however, many parents still allow children to eat while using gadgets (7). This habit has been shown to influence feeding practices, although previous research has indicated that gadget use is not associated with changes in physical activity (8). SSGI data (2021) report that the prevalence of overweight in Indonesian children is 3.8% and that in Lamongan Regency is 0.54% (9). A preliminary study in Windu Village (2022) also found that preschoolers often use gadgets during meals, leading to irregular eating patterns and potentially affecting their nutritional status.

The problem of using gadgets in preschool children stems from the habits of parents who give gadgets when eating, so that children are calm and willing to eat. This habit then causes dependence, where children only want to eat if accompanied by gadgets, so that gadget addiction occurs, which has an impact on irregular eating patterns and decreased physical activity. This condition increases the risk of obesity, as found by Tanjung et al. (2017) that children with high intensity of gadget use are more at risk of obesity than children with low use. If left untreated, this can cause nutritional disorders and metabolic diseases from childhood to adulthood. Previous

studies have mostly examined the association between gadget use and obesity; however, this study differed in terms of the contextual conditions in which it was conducted. During the COVID-19 pandemic, children's screen time increased significantly due to learning-from-home policies, restricted outdoor activities, and increased parental reliance on gadgets as coping tools, conditions that differed markedly from the pre-pandemic period. This study also focused on parents of children aged 3–5 years and was carried out in several villages in Karangbinangun District, Lamongan Regency. Children's nutritional status depends heavily on appropriate feeding practices by parents (11), and maternal factors such as knowledge, education, and income also play important roles (12). Therefore, parental involvement is crucial for limiting gadget exposure, selecting appropriate food content, and shaping healthy eating behaviors to prevent obesity and other nutritional problems.

These problems show that parents' lack of understanding of using gadgets as a tool actually causes unhealthy eating habits in children. Therefore, education is needed regarding the proper use of gadgets so that it does not have a negative impact on children's diet and nutritional status. Barnard's (1994) nursing theory, through Child's Health Assessment Interaction Theory, emphasizes the importance of interactions between children, caregivers, and the environment in shaping children's health, growth, and developmental behaviors (13). Parents play a major role in creating correct feeding practices and controlling the use of gadgets wisely. Therefore, this study aimed to determine the relationship between gadget addiction, feeding practices, and nutritional status in preschool-aged children. This study aimed to examine the link between gadget addiction and feeding habits, as well as the connection between gadget addiction and the nutritional status of preschoolers.

METHOD

This study employed correlational research with a cross-sectional design involving mothers of preschool children as respondents. The sample consisted of 125 mothers selected using a probability sampling strategy based on the minimum sample size requirement for correlational analysis. The determination of sample size referred to the rule of thumb for correlation studies, which requires at least 100 participants to achieve adequate statistical power while also considering the population distribution in the selected villages. The independent variables in this study were feeding practices and nutritional status of preschool children, while the dependent variable was gadget addiction. Data were collected using three questionnaires: a gadget addiction questionnaire and the Child Feeding Questionnaire (CFQ), both of which were administered to the mothers. All instruments used in this study have undergone validity and reliability testing in

previous research, with Cronbach's alpha values exceeding the minimum threshold of 0.70, indicating acceptable internal consistency.

Ethical approval for this study was obtained from the Health Research Ethics Committee of the Faculty of Dental Medicine, Universitas Airlangga (certificate number 806/HRECC). FODM/X/2022, issued on October 27, 2022. Permission for research was granted through an official decree issued by the relevant local authorities prior to data collection. All respondents were provided with clear explanations of the study objectives, procedures, potential risks, and confidentiality aspects, and informed consent was obtained from every participant prior to participation. Data analysis included descriptive analytical methods and Spearman's correlation tests to examine the relationships between variables.

RESULTS

Table 1 Demographic characteristics of mothers in the working area of the Karangbinangun Health Center in October-November 2022 (n=125)

Ye s	Respondent Demographics	Category	Frequency (f)	Percentage (%)
1.	Age	17-25 (Late teens)	18	14,4
		26-35 (Early Adult)	74	59,2
		36-45 (Late Adult)	33	26,4
2.	Work	Self employed	11	8,8
		PNS	2	1,6
		Housewives	105	84,0
		Teacher	3	2,4
		Private Employees	3	2,4
		Nurse	1	0,8
3.	Final education	Elementary	5	4,0
		Junior High	28	22,4
		Senior High	78	62,4
		College	14	11,2
4.	Family income per month	< IDR 2,501,997	95	76
		IDR 2,501,997	0	0
		> IDR 2,501,997	30	24

Table 1 explains the demographics of 125 respondents representing mothers of preschool-age children in five villages in the Karangbinangun Health Center working area from October to November 2022. The majority of maternal respondents in the early adult category aged 26-35 years were 74

respondents (59.2%). The final education level of most of the respondents with a high school education was 78 (62.4%). The majority of respondents had jobs as housewives, with a total of 105 respondents (84.0%), and family income per month was mostly still below the Lamongan Regency Minimum Wage (UMK), which is below Rp

2,501,997 for as many as 95 respondents (76%).

Table 2 Demographic characteristics of children by age and gender in the working area of the Karangbinangun Health Center in October-November 2022 (n=125)

Ye s	Responde nt Demograp hics	Category	Frequenc y (f)	Percent age (%)
1.	Age	> 3 Years	41	32,8
		> 4 Years	73	58,4
		> 5 Years	11	8,8
2.	Gender	Man	62	49,6
		Woman	63	50,4

Table 2 explains the child demographics of maternal respondents in five villages in the Karangbinangun Health Center working area from October to November 2022. Most respondents were girls, totaling 63 preschool children (50.4%). The age level was partially in the range of 48-59 months in 73 preschool children (58.4%).

Table 3 categories of Gadget addiction for preschool-age children in the work area of the Karangbinangun Health Center in October-November 2022 (n=125)

Ye s	Variable	Category	Frequen cy (f)	Percentag e (%)
1.	Gadget Addiction in Preschool Children	Heavy	9	7,2
		Moderate	22	17,6
		Light	94	75,2

Table 3 shows that most of the categories of gadget addiction for preschool-age children are classified as mild, with as many as 94 children (75.2%). The category of mild gadget addiction was obtained from the statement of mothers who did not give gadgets during meals, and the use of children's gadgets was relatively low, namely in the range of 1/2 h – 2 hs per day. Then, the category of medium gadget addiction and heavy gadget addiction is obtained from the statement that many mothers do not limit their children to playing gadgets.

Table 4 categories of feeding practices for preschool-age children in the working area of the Karangbinangun Health Center in October-November 2022 (n=125)

Yes	Variable	Category	Frequ ency (f)	Perce ntage (%)
1.	Feeding practices of preschool- aged children	Inaccurate	7	5,6
		True	118	94,4

Table 4 shows that the majority of feeding practices were applied to exactly 118 children (94.4%). This category of proper feeding practices is obtained from the statement of mothers who provide foods containing carbohydrates such as rice and animal side dishes such as meat, chicken, eggs, and fish. Mothers also give 2-3 pieces of fruit every day and feed the children 3-4 times a day. Then, the category of improper feeding practices was obtained from the statement of mothers who only fed 2 times a day and did not finish eating.

Table 5 categories of nutritional status of preschool-age children in the work area of the Karangbinangun Health Center in October-November 2022 (n=125)

Variable	Category	Frequenc y (f)	Percentag e (%)
BB/U	Severely Underweight (- 3SD)	2	1,6
	Underweight (- 3SD to <-2SD)	3	10,4
	Normal (-2SD to +1SD)	106	84,8
	At Risk of Overweight (> +1SD)	4	3,2
TB/U	Severely Stunted (- 3SD)	6	4,8
	Stunted (-3SD to <-2SD)	14	11,2
	Normal (-2SD to +1SD)	98	78,4
	Tall (> +1SD)	7	5,6

Table 5 presents the distribution of nutritional status among preschool-aged children based on weight-for-age (BB/U) and height-for-age (TB/U). For the BB/U parameter, most children were classified as

having normal weight, with a total of 106 children (84.8%). The smallest proportion was found in the severely underweight category, comprising two children (1.6%). For the TB/U parameter, the majority of children also fell within the normal height category, totaling 98 children (78.4%), while the severely stunted category had the lowest proportion, with six children (4.8%). This table provides descriptive information on nutritional status alone and does not assess

its relationship with socioeconomic variables such as family income. Therefore, conclusions regarding the influence of income or other household factors on children's nutritional status cannot be drawn from this table. Further analysis involving socioeconomic indicators is needed to determine whether such factors are associated with the nutritional status of preschool-aged children.

Table 6. The relationship between gadget addiction and feeding practices in preschool-age children in the working area of the Karangbinangun Health Center in October-November 2022 (n=125)

<i>Gadget addiction</i>	<i>Feeding Practices</i>				<i>Total</i>	
	<i>Inaccurate</i>		<i>True</i>		<i>f</i>	<i>%</i>
	<i>f</i>	<i>%</i>	<i>f</i>	<i>%</i>		
Heavy	0	0	9	100	9	7,2
Moderate	1	4,5	21	95,5	22	17,6
Light	6	6,4	88	93,6	94	75,2
Total	7	5,6	118	94,4	125	100
<i>Spearman's rho</i>			<i>Sig. (2-tailed) = 0.474</i>			

Table 6 shows that the majority of respondents across all categories of gadget addiction levels had feeding practices that were classified as "true." Spearman's correlation test showed a p-value of 0.474, indicating no relationship between gadget addiction and feeding practices among

preschool children. This absence of a relationship indicates that the level of gadget addiction, whether mild, moderate, or severe, does not affect the accuracy of feeding practices. The pattern seen in the table indicates that feeding practices tend to remain "true" across almost all categories of gadget addiction.

Table 7. The relationship between *gadget addiction* and nutritional status based on BB/U in preschool-aged children in the work area of the Karangbinangun Health Center in October-November 2022 (n=125)

<i>Gadget addiction</i>	<i>Nutritional Status (BB/U)</i>								<i>Total</i>	
	<i>Severely Underweight</i>		<i>Under weight</i>		<i>Usual</i>		<i>More Risk</i>		<i>f</i>	<i>%</i>
	<i>f</i>	<i>%</i>	<i>f</i>	<i>%</i>	<i>f</i>	<i>%</i>	<i>f</i>	<i>%</i>		
Heavy	0	0	0	0	9	100	0	0	9	7,2
Keeping	0	0	1	4,5	20	91	1	4,5	22	17,6
Light	2	2,1	12	12,8	77	81,9	3	3,2	94	75,2
Total	2	1,6	13	10,4	106	84,8	4	3,2	125	100
<i>Spearman's rho</i>			<i>Sig. (2-tailed) = 0.131</i>							

Table 7 shows the distribution of nutritional status based on weight/age for each category of gadget addiction. Most children at all levels of gadget addiction were at the "usual/normal" nutritional status level. The Spearman test obtained a p-value of 0.131, indicating no relationship between gadget addiction and nutritional status of weight/age

in preschool children. This absence of a relationship indicates that variations in gadget addiction levels do not affect respondents' nutritional status categories. The pattern in the table also shows that the proportion of "usual/normal" nutritional status remained dominant across all categories of gadget addiction.

Table 8 The Relationship of Gadget Addiction with Nutritional Status Based on TB/U in Preschool-Age Children in the Working Area of the Karangbinangun Health Center in October-November 2022 (n=125)

Gadget addiction	Nutritional Status (TB/U)								Total	
	Severely Stunted		Stunted		Usual		Tall			
	f	%	f	%	f	%	f	%	f	%
Heavy	1	11,1	1	11,1	6	66,7	1	11,1	9	7,2
Keeping	1	4,5	2	9,1	19	86,4	0	0	22	17,6
Light	4	4,2	11	11,8	73	77,6	6	6,4	94	75,2
Total	6	4,8	14	11,2	98	78,4	7	5,6	125	100
<i>Spearman's rho</i>							<i>Sig. (2-tailed) = 0.722</i>			

Table 8 shows the distribution of nutritional status based on height/age for each category of gadget addiction. The majority of children in all categories of gadget addiction have a "usual/normal" nutritional status. Spearman's test results showed a p-value of 0.722, indicating no relationship between gadget addiction and height/age nutritional status in preschool children. This absence of a relationship indicates that differences in gadget addiction levels are not related to variations in height/age nutritional status categories. The table pattern also shows that "usual/normal" status remains dominant across all levels of gadget addiction, with no particular trend indicating a relationship.

DISCUSSION

a. The relationship between gadget addiction and feeding practices in preschool-age children

The results of the analysis showed no relationship between gadget addiction and feeding practices in preschool-aged children. Most respondents were categorized as having mild gadget addiction and

demonstrated proper feeding practices, indicating that increasing gadget use did not correspond to appropriate feeding behavior. Gadget addiction is defined as excessive and uncontrolled smartphone use that negatively affects various aspects of daily life. It consists of three levels: mild addiction with a daily use of 30 minutes to 2 hours, moderate addiction with 3–4 hours per day, and severe addiction with more than 5 hours per day (14). Feeding practices refer to the type, amount, and schedule of food provided to meet daily nutritional needs (15).

Based on theory, gadget overuse can disrupt feeding practices through mechanisms such as reduced parental supervision, increased distracted eating, decreased responsiveness to children's hunger and satiety cues, and weakened parent-child interaction during meals (16). These negative effects are typically observed when gadget use reaches moderate or severe levels. However, in this study, the dominance of mild gadget use did not create conditions strong enough to influence feeding behaviors. Feeding practices are more consistently shaped by stable parental factors, such as nutritional

knowledge, education, and routine caregiving, than by short-duration gadget exposure (17). Consequently, the theoretical pathways linking gadget addiction to feeding practices were not activated, resulting in a nonsignificant relationship.

Excessive gadget use has the potential to disrupt feeding practices in preschool-aged children because high screen exposure is associated with distracted eating, reduced parental supervision during meals, and increased preference for unhealthy foods, as shown in previous studies, such as Tanjung et al., who found that prolonged gadget use can lead to improper feeding patterns and increased obesity risk (10). However, feeding practices are strongly shaped by parental and socioeconomic factors, particularly maternal education, nutritional knowledge, and family income, which determine the structure, quality, and consistency of meals provided (Noviyanti et al., 2020). These factors act as dominant predictors of feeding behavior, and in the context of this study, the majority of children fell into the mild category of gadget use, which is theoretically insufficient to significantly influence feeding practices. Therefore, the absence of a relationship in this study aligns with the theoretical understanding that gadget exposure affects feeding practices primarily at moderate or severe levels, whereas mild use does not exert a measurable impact.

Although excessive gadget use is theoretically associated with improper feeding practices—because preschool-aged children (3–5 years) are highly active, curious, and easily distracted, which often leads parents to adopt indulgent feeding styles, such as using gadgets to keep children calm during meals—this pattern was not reflected in the findings of the present study (18). The absence of a correlation may be explained by the fact that most children in the sample were categorized as having *Mild* gadget addiction, a level that does not typically trigger significant behavioral disruptions during feeding. In addition, feeding practices are strongly shaped by parental and household

factors, particularly maternal education, knowledge, and family income, as noted by Noviyanti et al. (13). These factors appear to play a more dominant role in guiding parents' feeding behaviors than the relatively low intensity of gadget use among the study participants. Consequently, the theoretical link between gadget addiction and improper feeding practices did not emerge empirically in this study.

The age factor of mothers is dominated by 29-34 years old, who still have a good function in processing information (19), especially in paying attention to the nutrition of their children and most of the parents of preschool children who come from high school graduates so that they can find information through the Internet. The other influence is the work of mothers, the majority of whom are housewives, so that mothers can accompany their children's daily activities and easily understand their children's behavior. The higher the influence of family income per month, the better the quality and quantity of food given to preschoolers.

b. The relationship between gadget addiction and nutritional status in preschool-age children

The results of the analysis showed that there was no relationship between gadget addiction and nutritional status in preschool-age children, because the results of the analysis showed the results of the gadget addiction, which is mild and normal nutritional status based on BB/U and TB/U and does not show that the higher the intensity of gadget use, the higher the nutritional level that exceeds the limit. Gadget addiction is the excessive use of smartphones that is difficult to control, and its influence extends to other areas of life in a negative way (20). Gadget addiction has three levels: mild addiction with a duration of play >30 minutes to 2 hours per day, moderate addiction with a duration or duration of play close to 3-4 hours a day, and severe addiction with a duration exceeding 5 hours per day (14).

Gadget addiction and nutritional status have a significant relationship if the intensity of excessive use of gadgets will cause excess nutritional status. This is in line with research conducted by Mahmudiono et al. (2020), which states that longer use of gadgets and less activity will lead to less energy being expended by the body and more will be stored as fat. In the long term, it causes fat accumulation and leads to obesity. The results of this study are also in accordance with the research conducted by Yuanda et al. (2022), which stated that there was a relationship between the duration of gadget use and nutritional status measured using the WHO weight/height z-score in preschool-aged children at kindergarten in Pontianak City. This relationship indicates that the higher the intensity of gadget use, the higher the risk of obesity (Tanjung et al., 2017). The results of another study stated that a preschool child who uses high gadgets can also have a good nutritional status with the categories of good BB/U, normal TB/U, and normal BB/TB. This is because nutritional status can be balanced when parents are able to regulate their diet, and the level of children's nutritional needs is in accordance with the nutritional needs of the body (22).

Gadget addiction and nutritional status in preschool-aged children do not have a significant relationship because there are several influencing factors. The child's age factor can affect both, which in the age group of 3-5 years is the stage of children where this period is when children begin to imitate, create, and explore freely (23). This is in accordance with several developments that they undergo, including psychosocial, psycho-intellectual, psychosexual, motor, and emotional development in preschoolers.

In the psychosocial development phase, children look very active, very curious, often ask questions that were not known before, start talking a lot, play, and perform activities outside the home (24). In the psycho-intellectual phase, children have an egocentric and rigid nature. In the motor and emotional phases, children begin to reduce

their own play activities, gather more often with friends, and experience increased social interactions during play (25). Therefore, children in the above phase do not always play with gadgets, except for the parental factor, which allows children to play gadgets without being limited by time so that they are prone to gadget addiction.

CONCLUSION

This study found no significant relationship between gadget addiction and feeding practices among preschool-aged children. This absence of correlation is likely due to the generally mild level of gadget addiction observed, which reduces the likelihood of direct behavioral disruption during feeding interactions. Feeding practices appear to be more strongly shaped by stable parental factors, such as education, occupation, income level, and caregiving routines, than by children's short-term gadget use patterns. Likewise, gadget addiction showed no association with nutritional status, which is multifactorial and heavily influenced by dietary quality, household food security, parental knowledge, and overall caregiving environments. Future research should explore these stronger determinants in greater depth and employ longitudinal or mixed-method approaches to better capture how family dynamics, parental behavior, and environmental factors may interact with gadget use to influence feeding practices and child nutrition over time.

Conflicts of Interest

The author states that there are no conflicts of interest that affect the implementation or results of this research.

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