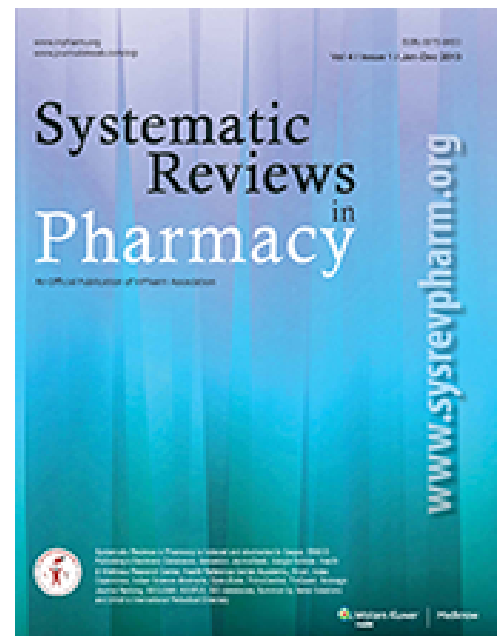


**Gadget Use, Pocket Money, and Snacking Habits of Children with and without Overweight/Obesity Problem in Surabaya, Indonesia**

Trias Mahmudiono, Qonita Rachmah, Diah Indriani, Triska Susila Nindya, Calisa Segalita, Susi Hidayah, Azizah Ajeng Pratiwi, Loh Su Peng

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 Trias Mahmudiono, Qonita Rachmah, Diah Indriani, Triska Susila Nindya, Calista Segalita, Susi Hidayah, Azizah Ajeng Pratiwi, Loh Su Peng

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### Research Article

#### [Neutrophil Extracellular Traps in Coronavirus Infection: Interaction Network Analysis](#)


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### Review Article

#### [An Observational Study Of Coronavirus \(Covid-19\) In Iraqi Patients At Al-Shifa Medical Center In Baghdad's Capital, Al-Rusafa](#)

 Saad Abdul Kareem Mohammed, Suha Hussein Ahmed, Ali I. Omran Al- Saadawi, Mohammed Mahmood Mohammed

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SRP. 2020; 11(11): 771 - 775

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.11.111

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#### Review Article

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SRP. 2020; 11(11): 776 - 778

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.11.112

---

#### Research Article

### [Levels of Myeloperoxidase, Malondialdehyde and Lipid Profile in Type 2 Diabetic Patients on Metformin Versus Glibenclamide Therapy](#)

 Zainab H. Fathi, Jehan A. Mohammad, Marwah H. Mohammed

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#### Research Article

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SRP. 2020; 11(11): 428 - 437

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.11.64

---

#### Review Article

### [Cytotoxic Activity of Ethanol Extract Legundi Leaf \(Vitex trifolia L.\) and N-Hexan, Ethyl Acetate and Ethanol-Water Fraction against MCF-7 Breast Cancer Cells](#)

 Peni Indrayudha, Indah Gita Cahyani

SRP. 2020; 11(11): 779 - 785

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---

#### Review Article

### [Detecting Mycobacterium Tuberculosis through Bacterioferritin Gene Amplification by Real-Time PCR](#)

 Raed Obaid Saleh, Nagham Maad Hamdi, Rana Kadhim Mohammed.

SRP. 2020; 11(11): 786 - 789

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.11.114

---

#### Review Article

### [MIC of Some Plant Extracts against E. Coli Isolated from UTI](#)

 Ibrahim Mohammed Saeed Hussein, Jalank Hameed Mahmoud, Halala Mohammed Abdulla

SRP. 2020; 11(11): 790 - 792

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.11.115

---

#### Review Article

[Acute Coronary Syndrome in Patients with Oncological Diseases](#)

👤 *N.A. Shanazarov, N.K. Seidalin, A.F. Khalirahmanov, G.D. Gatiyatullina, S.V. Zinchenko, K. F. Idrisova*

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#### Review Article

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👤 *Ahmed Kassem, Ayad N.D. Alhaki, Abd-Alhadi Jaithom Marzok.*

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#### Review Article

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👤 *Ahmed Dhary Saleh*

SRP. 2020; 11(11): 798 - 804

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#### Review Article

[Stunting Prevention Through Participative Counselling on The Implementation of Balanced Nutrition Toward Children by Involving Local Puppeteers in Central Lombok Regency, West Nusa Tenggara](#)

👤 *Made Darawati, Andi Eka Yuniarto, Ni Ketut Sri Sulendri, Omdah*

SRP. 2020; 11(11): 805 - 810

» [Abstract](#) » [PDF](#) DOI: 10.31838/srp.2020.11.118

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#### Research Article

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👤 *Ahmed Mohammed Hassan Murad and Majed H. Karbon*

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#### Review Article

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👤 *Muhammad Syarifuddin.*

SRP. 2020; 11(11): 811 - 817

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#### **Research Article**

##### [Breast Cancer in Patients with Gene Polymorphisms Associated with Metabolic Syndrome](#)

 *N. K. Seidalin, V. V. Benberin, N. A. Shanazarov, Voshchenkova T. A., Aripzhanova G. O., Zhapparov E. I.*

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#### **Review Article**

##### [CONTRIBUTION OF FORENSIC LABORATORY TO SCIENTIFIC CRIME INVESTIGATION IN INVESTIGATING LEGAL CASE OF DRUG ABUSE: A SYSTEMATIC REVIEW](#)

 *Rudy Heriyanto Adi Nugroho*

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#### **Research Article**

##### [In Vitro Stiumlation of Ergosterol from Coelastrella Terrestris by Using Squalene and Studying Antioxidant Effect](#)

 *Altaf AL-Rawi, Fikrat M. Hassan and Bushra M.J.Alwash*

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### [The Use of Information Technology in the Invariant System of Presentation of Learning Material in the Learning Process](#)

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 Ihor Bondar, Nadiia Bachynska, Tetiana Novalska, Vladyslav Kasian, Valerii Kuchnarov, Volodymyr Pylypiv.

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#### Review Article

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 N. A. Shanazarov, V. V. Benberin, N.K. Seidalin, A.F. Khalirakhmanov, E.A. Gaziyeve, S.V. Zinchenko

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# Gadget Use, Pocket Money, and Snacking Habits of Children with and without Overweight/Obesity Problem in Surabaya, Indonesia

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## ABSTRACT

**Introduction:** Overweight and obesity in children is a global health problem among children of all ages. Based on the Indonesia Basic Health Research, overweight problems in children aged 5 – 12 years was still high, 18.8% were overweight and 8.8% were obese. In developing countries, the rate increased obesity and overweight in children 30% higher than developed countries.

**Aims:** Our study aims to identify the relationship between gadgets use and pocket money with school children's nutritional status.

**Methods:** This research was a cross-sectional study involving 672 schoolchildren randomly selected from ten elementary schools in Surabaya City, Indonesia. Data about duration of gadget use, pocket money, and snacking habit were assessed using structured questionnaire. Body weight and height were directly measured to calculate the subject's nutritional status using digital weight scale and stadiometer. Statistical analysis done in this study was Chi-square test to assess the relationship between variable tested.

**Results:** The results showed that 38.8% of participants were overweight. 71.9% children were having gadget use for more than 2 hours/day, exceeding the recommended time use. Duration of gadget use and pocket money were significantly correlated with the nutritional status of school children ( $p < 0.001$ ). Snacking habits at home ( $p = 0.302$ ) and school ( $p = 0.933$ ) were not significantly correlated with nutritional status.

**Conclusions:** Gadget use duration and pocket money proved to be correlated with the increase of nutritional status among schoolchildren. Thus, parents should pay more attention to control gadget use and pocket money to prevent overweight.

**Keywords:** Gadgets, Pocket Money, Snacking Habits, Overweight, School Children

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## INTRODUCTION

Overweight and obesity in children is a global health problem among children of all ages. Obesity can be defined as abnormal fat accumulation or fat excess that raises health problems. Overweight or obese children tend to permanently to become overweight or obese on adults and more a risk to have an incommunicable disease like diabetes mellitus and cardiovascular diseases (1,2). Based on the Indonesia Basic Health Research, overweight problems in children aged 5 – 12 years was still high, 18.8% were overweight and 8.8% were obese (3).

In developing countries, the rate increased obesity and overweight in children 30% higher than developed countries (1). Obesity and overweight in children have various effects both direct and long term on health and well-being. Obese and overweight children tend to have a risk factor for metabolic syndrome diseases such as cardiovascular, diabetes mellitus, high cholesterol, and high blood pressure (4). Several risk factors cause an increased prevalence of obesity and overweight in children. The basic cause of obesity in children is an imbalance between energy in and energy out. Childhood obesity is associated with high intake of foods high in sugar and fat followed by increased use of devices in children which results in decreased physical activity. When the physical activity is reduced, energy will not be used and heaped up in the body as fat. Besides, along with

the development of technology the use of gadgets for children also increases. They spend more time playing video game and gadgets than doing physical activity (5). The high interaction of children with technology and the internet causes reduced physical activity in children. The American Academy of Pediatrics recommends that children use gadgets no more than 1-2 hours per day. Obesity and overweight in children are also related to unhealthy food consumption patterns. Foods high in fat and carbohydrates tend to increase body fat mass if not use to activity. School-age children spend a lot of their time at school. The amount of their pocket money will affect their purchasing power. Children that have a lot of pocket money may encourage to buy foods that they like and in large quantities (6). Of the 100 primary school students in Serang, Indonesia, all consume snacks at least once a day (7). Almost all students (98%) consume sweet bread in a week. Consuming sugary drinks as snacks contributes to increased carbohydrate intake where most of the packaged drinks such as soda and other flavored drinks have high sugar content. Apart from being made from sugar, the majority of snack foods (44.7%) were made from flour. This was related to the ingredients that were relatively easy to process, cheap and had a good taste for children (8).

## MATERIALS AND METHODS

This was an observational analytic study using cross-sectional design. The population of this study was school-aged children in Surabaya, while sample in this study was the school-aged children in ten elementary schools in Surabaya that chosen by simple random sampling method. Based on the Lemeshow formula (difference of two proportion), minimum sample size is 672 samples (9).

### Study Procedure

The first step of this study was the preparation for taking the data. Data collected in our study including respondent's characteristic (age, gender), duration of gadgets use, pocket money, and snacking habits. All data were collected using structured questionnaire. Body weight was measured using electric weight scales with an accuracy of up to 0.1 kg and height was measured using a stadiometer with an accuracy of up to 0.1 cm.

### Data Analysis

Univariate analysis was performed to describe the respondent's characteristics such as age, gender, nutritional status, duration of gadgets uses, pocket money, and snacking habits. Bivariate analysis using the chi-square test was conducted to analyze correlations of nutritional status with duration of gadgets usage, pocket money, and snacking habits with significant level of  $\alpha < 0.05$ . This study was ethically approved by Health Research Ethical Clearance Commission of Faculty of Nursing, Universitas Airlangga (Number: 1757-KEPK). Informed consent was obtained from all participants before the study was conducted. After proximate analysis was done, the data will be tabulated and averaged using Microsoft Excel.

## RESULTS AND DISCUSSION

As seen in Table 1, our study revealed that the total subjects were 672 respondents. Subject characteristics were seen based on gender, age, nutritional status, amount of pocket money, duration of gadget use, and snacking habit. The majority of subjects were female (51.7%). Most of them were between 8 – 10 years old (62.6%) with an average age of 10 years. Nutritional status based on the Body Mass Index for Age (BMI for Age) showed that more than 60% of the total subjects (61.2%) have a normal nutritional status while those with overweight status are around 38.8%. More than half of the subjects (55.3%) have pocket money >IDR 7,000 (equal to USD 0.5). The average duration of using gadgets per day of the subjects is 344 minutes (5 hours 44 minutes) or nearly 6 hours per day. The total subjects that used gadgets more than 2 hours per day (>120 minutes per day) are 483 subjects (71.9%) and 189 subjects (28.1%) used gadgets  $\leq$  2 hours per day ( $\leq$  120 minutes per day). Higher duration of gadget use is strongly correlated with COVID-19 pandemic situation whereas students have to do online learning for the past eight months. This should be evaluated for school, how to create a distance learning by minimizing gadget use, for instance, online meeting only conducted for 2 out of 5 days in a week and the rest 3 days can be used for non-online learning. Based on snacking habits, most subjects ate snacks with not frequent both at school and at home. The subject who often consumed snacks at school is 311 (46.3%) and more than 50% did not eat snacks frequently. The snack consumption at home was carried out frequently by 218 subjects and more than 60% had a snacking habit was not frequent.

Table 1: Participants Characteristics

Variables	N (%)	Mean $\pm$ SD or median(min-max)
Sex		
• Girls	324 (48.3)	
• Boys	348 (51.7)	
Age		10.19 $\pm$ 0.75
• 8-10 years	421 (62.6)	
• 11-12 years	251 (37.4)	
Nutritional Status (BMI for Age)		
• Overweight and obese	261 (38.8)	
• Normal	411 (61.2)	
Pocket Money (IDR)		7,000 (0-60,000)
• $\leq$ 7,000	372 (55.3)	
• > 7,000	300 (44.7)	
Duration of Gadgets Usage		344 $\pm$ 367.9
• $\leq$ 120 minutes/day	189 (28.1)	
• > 120 minutes/day	483 (71.9)	
Snacking Habits in School		
• Frequent	311 (46.3)	
• Not Frequent	361 (53.7)	
Snacking Habits in Home		
• Frequent	218 (32.4)	
• Not Frequent	454 (67.6)	

Table 2: Correlation based on Chi-Square Analysis

Dependent Variable	Independent Variable	P-value
<b>Nutritional Status</b>	<b>Duration of Gadgets Usage</b>	<0.001*
Overweight	≤120 minutes/day	
Non overweight	>120 minutes/day	
	<b>Pocket Money (IDR)</b>	<0.001*
	≤ 7,000	
	>7,000	
	<b>Snacking Habits at Home</b>	0.302
	Frequent	
	Not Frequent	
	<b>Snacking Habits at School</b>	0.933
	Frequent	
	Not Frequent	

\*Statistical Test using Chi-square at significant level of  $\alpha < 0.05$

Table 2 showed that based on the chi-square statistical test, the duration of gadget usage and the amount of pocket money had a significant relationship with nutritional status ( $p = <0.001$ ). Meanwhile, snack consumption habits at school ( $p = 0.933$ ) and at home ( $p = 0.302$ ) were not related to nutritional status ( $p > 0.05$ ).

Our study found overweight and obese prevalence was higher more than national prevalence (38.8% and 27.6%, respectively). Overweight children mostly used gadgets with a duration of more than 120 minutes/day (>2 hours/day). Using gadgets for more than 2 hours per day is deemed an unhealthy lifestyle because of lack physical activity (10). More duration use for gadget and less activity will cause lesser energy released by the body and more will be stored as fat. In the long term, it will cause fat accumulation and lead to obesity problems. Increased screen time, including excessive use of gadgets, is associated with decreased physical activity and consumption of healthy foods (10). Spending too much time watching television and playing video games is significantly associated with an increase in Body Mass Index (BMI) (11).

In addition to the duration of gadget usage, the amount of pocket money was also related to children's nutritional status ( $p < 0.001$ ). Most of the children with overweight nutritional status have an allowance of more than IDR7000 (or equal to USD 0.5), while the children who are not overweight mostly have an allowance of  $\leq$  IDR7000. The amount of pocket money a child has will affect the purchasing power of food at school. With a large allowance, it is possible that the amount of food they can buy will also be more than children with a small allowance. A large pocket money encourages children to consume excessive amounts of food regardless of the nutritional value contained in it (6). Children who receive large pocket money tend to have a poor diet and often consume fast food. They also have a bigger BMI when compared to children who have a small pocket money.

Nutritional status is not related to children's snacking habits both at home and at school. This is because children's food intake does not only come from snacks but also main meals. Snacks contribute about 30% of the total daily calorie needs. Consumption of snacks will increase body fat mass if consumed excessively and frequently (12). In this study, respondents who were overweight and not overweight ate snacks with infrequent frequency so that they did not affect the increase in their body mass index.

### CONCLUSION

Based on the results of research and discussion, it can be concluded that the duration of gadget use and pocket money have significant correlations with children nutritional status. The BMI-for-age of the children increased with the increase of the duration of gadget use and pocket money spent. Therefore, intensive nutrition education should target on how to manage the duration of gadgets use and wisely spend pocket money to prevent obesity and overweight among schoolchildren. Future research should also investigate the contribution of low physical activity and gadget use to overweight/obese children.

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