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Original Article

# The duration of playing Play Station@ as a risk factor of obesity in school age children in Yogyakarta

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## Abstract

***Background*** Childhood obesity is a common health problem. There are multi-factors causing childhood obesity. One of them is lack of activity like watching television, playing computer, and playing Play Station@.

***Objective*** The aim of this study was to find the duration of playing Play Station@ as a risk factor of obesity in school age children.

***Methods*** This study was a case–control study with individual matching, that was done since April 2004 until August 2004.

***Results*** Children who spent time for playing Play Station@ more than two hours per day had the risk of obesity 22 times higher than those who spent less than two hours per day with 95% confidence interval. These results were analyzed with chi square test.

***Conclusion*** Playing Play Station@ is a risk factor of obesity in school age children. **[Paediatr Indones 2008;48:15-17]**.

***Keywords:*** *obesity childhood, activity, Play Station@, case-control*

Obesity is a condition of excessive accumulation of lipid in the body as a result of imbalance between energy obtained and energy used.[1] Several studies showed that obese children had a higher risk of suffering from coronary heart disease, hypertension, diabetes mellitus, atherosclerosis, dyslipidemia, and hypercholesterolemia.[2-7] Many factors may contribute to obesity such as genetic and socioeconomic factors, the habit and the pattern of eating, and low activity.

Low activity can contribute to obesity because energy obtained exceeds energy used and subsequently the excess was stored into lipid.[8] Examples of activity using less energy are playing Play Station@, game watch, and game program in the computer. Increased duration to watch television or to play game using television media correlates with the increased incidence of obesity in children.[8-10] This relates with less energy used that is characteristic for such activities. Moreover effect of food consumption caused by food advertising subsequently influences the pattern of eating.[11-13]

Gortmaker[14] showed that children who watched television for 2 until 5 hours per day had the risk of becoming obese 5.3 times higher than those who watched television for less than 2 hours per day. Andersen[4] also showed that 60% children watching television or playing video games for 2 hours per day at least had imbalance energy that resulted in obesity.

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We aimed to determine the duration of playing Play Station@ as a risk factor of obesity in school age children.

## Methods

The study design was a case-control study. Obese children as the case group were compared with non-obese children as the control group. Subjects were children aged 10-12 years from government elementary schools in Yogyakarta Municipality. Sample size was 53 children in each group. Sample estimation was based on the study results by Tanasescu.[8] The inclusion criteria were age of 10-13 years, BMI >95 percentile for the case group and BMI <95 percentile for the control group, who have hobby of playing Play Station@ at home or at rental game houses, and parents agreed to participate in this study by signing informed consent. The exclusion criteria were those who fulfilled the inclusion criteria, but they couldn't be involved in this study.

This study was a part of national multicenter study on obesity, which involved children from all government elementary schools in Yogyakarta Municipality in 2004. Obesity screening included body weight, body height, upper arm diameter, skin fold thickness, and waist diameter, which resulted in the prevalence of obese children as much as 11 %. They were given questionnaire to identify the factors studied in this study.

Data were presented using tables, odds ratio and percentage. We tested the hypothesis by chi square test. Matching were done and odds ratios were obtained with 95% confidence intervals.

## Results

There were 106 subjects recruited, consisted of 53 obese subjects (case group) and 53 non-obese subjects (control-group). **Table 1** shows that among subjects, the baseline characteristics, including sex, mother education level, are not significantly different.

**Table 2** shows that children with low physical activity have the risk of obesity 9 times higher than those with high activity with 95% CI (4.265;19.466) and this was statistically significant (P=0.001).

**Table 3** shows that children who played Play Station@ more than 2 hours per day have the risk of obesity 22 times higher than those who played less than 2 hours per day with 95% CI (5.625;85.429) and this was statistically significant.

## Discussion

Obesity in children may be caused by many factors such as genetic factors, the pattern of eating and socioeconomic factors. This study focused on low activity , which was assumed that energy obtained exceeded energy used, resulting in the extra energy storage (obesity). Many studies showed that obesity caused by low activity in children. Low activity is physical activities using less energy such as playing Play Station@, game watch, and game program in the computer. High activity is physical activities using more energy like running, playing football, playing bicycle.

This study showed an increased risk of obesity in children who played Play Station@ more than 2 hours per day compared with those who played less than 2 hours per day.

**Table 1.** Basic characteristics of study subjects

| | Obese n (%) | Non Obese n (%) |
|---|---|---|
| Subject number | 53 | 53 |
| Sex | | |
| • Boys | 32 (60%) | 34 (64.2%) |
| • Girls | 21 (40%) | 19 (35.8%) |
| Mother education | | |
| • <Junior high school | 9 (17%) | 14 (26.4%) |
| • Junior high school | 4 (7.6%) | 9 (17%) |
| • Senior high school | 21 (39.6%) | 20 (37.7%) |
| • High education | 19 (35.8%) | 10 (18.9%) |
| Father education | | |
| • <Junior high school | 6 (11.4%) | 7 (13.2%) |
| • Junior high school | 5 (9.4%) | 10 (18.9%) |
| • Senior high school | 19 (35.8%) | 21 (39.6%) |
| • High education | 23 (43.4%) | 15 (28.3%) |
| Obesity in the family | | |
| • - | 5 (9.4%) | 19 (35.8%) |
| • Mother | 15 (28.3%) | 13 (24.5%) |
| • Father | 18 (33.9%) | 13 (24.5%) |
| • Grandfather | 2 (3.8%) | 3 (5.7%) |
| • Grandmother | 4 (7.5%) | 1 (1.9%) |
| • Uncle | 2 (3.8%) | 2 (3.8%) |
| • Aunt | 3 (5.7%) | 2 (3.8%) |
| • Brother | 2 (3.8%) | - |
| • Sister | 2 (3.8%) | - |

**Table 2.** Risk of activity pattern to obesity

| | Obese n (%) | Non-Obese n (%) | Statistical test | OR(95%CI) | P value |
|---|---|---|---|---|---|
| Low activity | 47 (88.7%) | 2 (3.8%) | $x^2$ | 9 (4.265;19.466) | 0.001 |
| High activity | 6 (11.3%) | 51 (96.2%) | | | |

**Table 3.** Risk factor duration of playing Play Station@ to obesity

| | Obese n (%) | Non-Obese n (%) | Statistical test | OR(95% CI) | P value |
|---|---|---|---|---|---|
| >2hours/day | 51 (96.2%) | 6 (11.3%) | $x^2$ | 22 (5.625;85.429) | 0.001 |
| <2hours/day | 2 (3.8%) | 47 (88.7%) | | | |

This result confirms previous studies that done Stephen, Andersen, and Tanasescu; which showed that children with low activity patterns such as playing electronic games which were assumed the same as playing Play Station@ in this study, had higher risk of obesity compared with those with high activity patterns.

This study also has weaknesses. It didn't distinguish whether playing Play Station@ done during holidays or during school days; without considering the amount of calorie intake, eating pattern, and genetic factors. Therefore further studies are needed.

From the data above, we concluded that the duration of playing Play Station@ more than 2 hours per day has the higher risk of obesity compared with that of less than 2 hours per day in school age children.

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