

Relationship Between Game Online Addiction With Body Posture Among Elementary School Students in Pekalongan City, Central Java, Indonesia

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Abstract

Background : Indonesia's Minister of Health (2017), expressed concern about the popularity of online games among children and adolescents which affect to many health problem such as : aggression, physical injury and addiction. One of its problem was body posture in elementary school students is needed to anticipate the worse impact. **Purpose :** This study aimed to describe relationship between game online addiction with body posture among elementary school students gadget active user in Pekalongan City. **Method:** This study was used correlative studydesign with cross sectional approach. 117 elementary school students were involved as samples in this study using purposive sampling technique. This research was conduct during April to May 2019 in 4 (four) elementary school in Pekalongan. Flexible Curve Ruller method were using to measure body posture of elementary school students. While Indonesian Game Online Addiction instrument developed by Griffin (2009) was used to measure game online addiction. Chi-Square analysis was used to analyzed the result of this study. **Results:** Chi-square test results obtained p-value of 0.027 by using alpha of 0.05 then the p-value or sig. <0.05. Thus Ho is rejected, meaning there is a relationship between online game addiction and body posture in elementary school children. **Conclusion:** elementary school need to develop strategies to reduce gadget using in elementary school students. Healthcare provider need to develop strategy to overcome bad posture disorder in elementary school student. **Recomendation:** Both of school and healthcare provider should have collaboraive strategy to prevent bad posture in elementary school children.

Keywords: bad posture, gadget, gameonline, flexible curve ruller, khyposis

Introduction

According to the Statista The Statistic Portal survey in 2018 internet users in the world reached 3.9 billion from a total population of approximately 7.6 billion people. Indonesia Internet Service Provider Association (APJII) which conducted a survey of internet users in Indonesia in 2017, the result is the number of active internet users reaching 143, 26 million people or around 54.68% of the total population in Indonesia. Most internet users are currently in the Java region. The second position was followed by the regions of Bali, Sumatra, Kalimantan, Sulawesi, Maluku-Papua. Judging from the age classification, most internet users are still aged 13-18 years, which reaches 75.50% of the total users. Meanwhile, according to Gaimin (Game, Main, Gain) in 2018 out of an estimated 7.6 billion people living on earth, there are 2.2 billion game users. That means that almost one third of the people on this planet are gamers. 1.2 billion using games via PC (Personal Computer). Meanwhile according to

Newzoo in 2017, game users in Indonesia as many as 43.7 million and entered the ranking of 17 most game revenue in the world.

There are several negative impacts of online games, one of which is addiction to online games, which is currently experienced by teenagers, especially students, which can affect the social aspects of adolescents in living their daily lives, because the amount of time spent in cyberspace causes teens to interact less with others in real world. This certainly affects the social activities that are usually carried out by most other people. Students who often play an Online Game will become addicted and will experience dependency on game activities, and reduce learning time. This is what can affect the learning outcomes. Leung (2014) refers to teenagers who are addicted to the internet as "net generation". Thus, he observed teenagers "net generation" and adolescents who are not addicted to the internet. Whereas teens who are not addicted to the internet use the internet to get information, teenagers "net generation" spend

time chatting in the chat room for fun or spending their time in interactive online games to escape from the real world. Examples of cases of online game addiction that occurred in Indonesia alone cases that occurred in October 2018 in the city of Banyumas, namely ten children experiencing mental disorders due to game addiction. Mental Specialist Doctor Banyumas Hospital said that the criteria for mental disorders online game addiction is due to too much interaction with the virtual world and usually has a trait that triggers someone's obsession. The doctor provides therapy for mental disorders in the form of sedatives so as not aggressive and invited to interact with the community in real terms (Merdeka.com, 2018).

The Indonesian Minister of Health openly expressed his concern regarding the popularity of online games among children and adolescents. Research by Weinstein in 2010, there are many problems associated with the use of online games, such as: aggression, physical injury and addiction. Physically, health problems in online game addiction in children can be seen from changes in the child's normal posture. Posture that often changes into bad postures such as hyperkhyposis, scoliosis, forward head position. According to Park, 2017 in his research entitled "The effects of smart phone gaming duration on muscle activation and spinal posture", examines changes in cervical and thoracal posture angles, along with changes in user muscle activation, at the beginning and at 5, 10, and 15 minutes of smartphone use, the cervical and trunk flexion results were significantly increased at 5, 10, and 15 minutes ($p < 0.05$) compared to participants' cervical and trunk flexion at the beginning of smartphone use. This study aims to identify the relationship of online game addiction with changes in body posture in children in SD Pekalongan City. The results of this study will be useful for parents, education service providers and children to prevent postural disorders caused by using smartphones or playing games.

Methods

This research uses descriptive correlation method with cross sectional approach. The study was conducted in 4 (four) Elementary Schools in Pekalongan City, Central Java, Indonesia in May 2019. The sample was elementary school students grade IV, V and VI, totaling 117 students. The variables in this study are Online Game Addiction as an independent variable and Posture Change as the dependent variable. The research instruments used in this study were questionnaire and flexible curve ruller. Online game addiction is measured using the Indonesian Game Online Addiction instrument developed by Griffin (2009). This questionnaire has been tested for validity and reliability. Whereas body posture is measured using a Flexible Curve Ruller which is an internationally recognized tool that is calibrated. The validity of the flexicurve method is 0.94 and the reliability is 0.94 (titania, 2012). This tool provides the advantage of an easy, fast and inexpensive inspection.

The results of the analysis use a nonparametric test with a Square Test. Likewise if the data are normal, the Square Test will also be applied to determine the relationship between the level of online game addiction and posture changes. To be able to make a decision about the proposed hypothesis is accepted or rejected, then the provisions apply if $X^2 \text{ count} \leq X^2 \text{ table}$ or $p \text{ value} < 0.05$ then H_0 is rejected, meaning there is a relationship between online game addiction to posture in elementary school children, and if $X^2 \text{ count} > X^2 \text{ table}$ or $p \text{ value} > 0.05$ then H_0 is accepted, meaning that there is no relationship of online game addiction to body posture in elementary school children (Sugiyono, 2010).

Results

1. Game online addiction

Table 1 : Distribution Frequencies and Percentage of Game Online Addiction Among Elementary School Students in Pekalongan City 2019

Game online addiction	Total	Percentage (%)
Low	59	50,4
Medium	44	37,6

High	14	12
Total	117	100

Table 1 showed that majority of elementary school student's have low level of game online addiction which amount 50.4%.

2. Body Posture

Table 2 : Distribution Frequencies and Percentage of Body Posture Among Elementary School Students in Pekalongan City 2019

Body Posture	Total	Percentage (%)
Flat	6	5,1
Normal	77	65,8
Hyperkhyposis	34	29,1
Total	117	100

Table 2 showed that majority of elementary school students have normal body posture which amount 77 students (65.8%).

3. Relationship of Game Online Addiction with Body Posture Among Elementary School Students in Pekalongan

Table 3 : Relationship of Game Online Addiction with Body Posture Among Elementary School Students in Pekalongan

	Value	Df	Asymp. Sig (2-sided)
Pearson Chi-Square	10.958	4	.027
Likelihood Ratio	13.353	4	.010
Linear-by-Linear Association	8.664	1	.003
N of Valid Cases	117		

Table 3 shows that the Chi-square test results obtained p-value of 0.027 by using alpha of 0.05 then the p-value or sig. <0.05. Thus H_0 is rejected, meaning there is a relationship between online game addiction and body posture in elementary school children.

Discussion

Based on the results of statistical tests between online addiction games and changes in body posture using the Chi-square test, the results obtained were 0.027 (<0.05).

This is in line with research entitled THE EFFECTS OF SMARTPHONE ADDICTION ON CHILDREN'S CERVICAL POSTURE AND RANGE OF MOTION, showing that children who have a smartphone addiction four times higher experience Forward Head Posture (FHP) than those who do not, with a 95% ratio scale (CI) = 4.5 (1.2, 10.7), $p = 0.03$. mean cervical angle in addicted or not boys, boys (49.4 ± 6.7 vs. 55.5 ± 7.6 , $\eta^2 = 0.5$, $p = 0.03$) and girls (47.3 ± 6.3 vs. 52.9 ± 6.1 , $\eta^2 = 0.9$, $p = 0.02$) (Alonazi et al, 2019). The obsession with smartphones among children today is basically a problem of addiction which is defined as a very large dependence on smartphone usage and its services including online games, therefore online games among children can cause them to become addicted, which is considered as one of the health problems among children.

According to Kusumadewi (2012) someone who is addicted to regular use of 2-10 hours per day, even 39 hours a week (Young, 1998) or an average of 20-25 hours a week (Chen & Chou; Chou & Hsiao, in Chou, et al., 2005) to play online games. Addicted to online games in children can reduce children's physical activity resulting in increased sedentary lifestyle and health problems. Park et al (2015) found that when a person uses a smartphone for a long period of time, the neck usually settles in a bent position, which can cause certain musculoskeletal disorders such as upper cross syndrome. This syndrome involves tension of the upper trapezius muscle, levator scapula, and rhomboid muscle, which results in weakening of the muscles used for cervical flexion movements.

Other results show that cervical and lumbar flexion angles were significantly higher in the older smartphone user group (300 seconds) compared to the smartphone user group in a short time (3 seconds) Kim et al (2013). The use of smartphones in this case playing online games for a long time can affect changes from the spine

curve, both cervical and thoracic curves, to thoracic curves in children tend to experience what is called kyphosis, kyphosis curve at the age of children normally is 200 - 440, more than 450 are called hyperkyphosis. The position of the body when playing online games the children are more in a sitting and bending position thus increasing the thoracic curve above 450. In that position can experience muscle imbalance due to muscle tension in the front of the thorax (intercostal muscles), the muscles that berorigo dithoraks (major and minor pectoralis muscles, one hundred anterior and latissimus dorsi), muscles and cervical muscles that are connected to the scapula and muscles in the cervical. There is also stretching and weakness of the thoracic erector spine and scapular retractor muscles. Under these conditions it causes hypomobility and it is difficult to hold the upright movement (extension) so that blockade of the facet and costovertebra joints can occur which in turn causes pain in the neck and back.

Research reveals that excessive use of smartphones places the head in an unchanging position and continuous muscle contraction then causes muscle weakness and fatigue that can easily develop into chronic cervical pain (Viljanen, 2003). In addition, continuous static pressure at certain sites can also increase muscle fatigue and pain. Park, 2017 in his research entitled "The effects of smart phone gaming duration on muscle activation and spinal posture", examines changes in cervical and thoracic posture angles, along with changes in user muscle activation, at baseline and at 5, 10, and 15 minutes smartphone usage, the cervical and trunk flexion results were significantly increased at 5, 10, and 15 minutes ($p < 0.05$) compared to participants' cervical and trunk flexion at the beginning of smartphone use. EMG activation and 10% amplitude probability distribution (APDF) values of bilateral erector spinae values at 5-6, 10-11, and 15-16 minutes of use ($p < 0.05$) are also significantly greater than at the beginning of use. Activation of bilateral EMG trunk and lower trapezius decreased significantly at 5-6, 10-11, and 15-16 minutes of use ($p < 0.05$). The use of

smartphones induces a more bent posture in the cervical and trunk. The use of smartphones also changes posture, activates muscles in a relatively short time, only 5 minutes and causes pain after 16 minutes of smartphone use.

In line with the results of Juliana's (2015) study of risk factors for posture change in children and adolescents, the prevalence of postural changes was 79.7% ($n = 47$), where 47.5% ($n = 28$) showed changes in the frontal plane and 61 % ($n = 36$) changes in sagittal plane. Risk factors for posture changes include thoracic kyphosis posture and female gender, physical exercise only once or twice a week, sleep more than 10 hours, inadequate posture when sitting in a chair and sitting to write. In the phases of childhood and adolescence associated with the school phase, where their posture is more in a long sitting position, the tendency for sedentary lifestyles throughout school time can also support the emergence of static posture changes. In addition, there is a tendency that postural habits adopted in childhood and adolescence will continue into adulthood (Lemos, 2012). The results of other studies indicate that the prevalence of changes in posture in school children reaches 90.62% of all cases. The most frequently observed postural change is thoracic hyperciphosis, which is associated with back pain in school children. (De Vasconcelos GA, 2010).

Conclusion

The conclusion of this study is the change in posture in elementary school children is related to the level of addiction to play online games (online game addiction). The duration of playing online games, body position when playing online games and giving gadgets too early can be a factor in online gaming addictions and changes in posture. Changes in posture seen in children who experience online addiction games are on increasing thoracic curve called hyperkyphosis.

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