Relationship between Internet Addiction with Physical Fitness, Hemoglobin Levels and Leukocyte Levels to Students

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Abstract

This study focused on the analysis of the relationship between internet addiction with physical fitness, hemoglobin levels and leukocyte levels of students at the Health Polytechnic of Ministry of Health in Makassar, Indonesia due to the changing life style of students with internet addiction causing lack of sleep, uncontrolled nutrient consumption and lack of physical activity. The design used in this research was cross-sectional. Of 58 people as a sample, it was known that there is a weak correlation between internet addiction with physical fitness, hemoglobin level and leukocyte level with r <0.5, with p value for leukocytes = 0.046. While p value for hemoglobin and physical fitness was >0.05. Internet addiction correlated weakly with leukocyte levels, hemoglobin levels and physical fitness (VO_2max). There was a significant relationship between internet addiction with leukocyte levels (p = 0.046).

Keywords: internet addiction, physical fitness, hemoglobin, leukocyte.

I. INTRODUCTION

The rapid development of the internet offers a variety of exciting facilities and is supported with a variety of features. This makes people drift to hunt down information that is actually less useful. If internet users are not able to control its use, then the demand for satisfaction will continue to increase, so that internet users reach the level of internet addiction (IA).

Adolescents are more susceptible to IA, as they are in a transitional period that provides an opportunity to try different lifestyles and determine the patterns of behavior and values that best suit themselves. Therefore, it is not surprising that today's IA phenomenon among teenagers has become a global epidemic. Estimates of IA prevalence vary, ranging from 5% -35% in different populations (Greenfield, 1999; Scherer, 1997; E.Aboujaoude, et al., 2006; A. Johanson and KG Gotestam; 2004; Lam LT et al., 2009; C. Chou and MCHsiao, 2000; HRWu and KJZhu, 2004; Simon KE, et al, 2008; Tsitsika, et al, 2009). In Indonesia, nearly 80% of adolescents experience IA (UNICEF, 2014). Based on the above data, of course not yet known the actual facts in Indonesia, because the validity of the data depends on the questionnaire and data collection techniques used. But it is not impossible that what happened is actually smaller or even greater than what has been reported

Padmapriya & Sujaya (2013) report that adolescent physical fitness declined over the last 20 years. Even in Indonesia it is reported that less than 20% of the population of Indonesia who have physical fitness in the category of medium or higher (Ditjora, 2006). The severe impact is that Indonesia is included in the top six countries in Asia (China, India, Indonesia, Japan, Pakistan and Bangladesh) with the prevalence of hypokinetic disease (including heart disease, obesity, diabetes and certain cancers (Chin Ming Kai , 2008) .The Ministry of Health of the Republic of Indonesia stated that deaths from non-communicable diseases reached 57% by 2015. Lack of physical activity contributed as a cause of 26.1%. One of the factors that affect fitness level is hemoglobin level. Hemoglobin is a protein molecule in red blood cells that serves as a transport medium of oxygen from the lungs to the entire body tissue to be used as fuel and carry carbon dioxide from body tissues to the lungs for disposal. The low physical fitness indirectly affects the levels of Hemoglobin and Leukocyte levels that impact on decreased endurance and immunity. They do not realize that internet addiction can cause harm to health. To prove it, it is necessary to do research that analyzes the relationship between internet addiction with physical fitness, hemoglobin levels and leukocyte levels so that it can be used as a source of information to provide appropriate treatment on the condition.

II. METHODS

In this study, researchers used a criterion based on the scale of Young (1996) known as Internet Addicition Test (IAT). The higher the value gained, the greater the impact of internet use within a person. A very high value (> 80) indicates that internet usage causes problems in one's life. Measurement of physical fitness using the Bleep Test by running 20 meters distance back and forth, starting with a slow run, then gradually becomes faster, so the testee is not able to follow the rhythm. Along with the time mileage 20 meters there is whistle 1 time and along with the last time back and forth at each level there is a whistle 2 times. At the start, the testee stands with both legs behind the starting line. When given the "Ready" command, the testee ran by the rhythm of time to the boundary line so that one of the legs crossed the line. If before any testee whistle has exceeded the boundary line

then when will return he must wait for the whistle. Conversely if there has been a testee whistle has not reached the boundary line, then he must accelerate run to cross the line and immediately back again in the opposite direction. If 2 consecutive times the testee is unable to follow the rhythm, it means maximum ability at the level. After the testi is not able to follow the rhythm, he should not stop immediately, but must continue to run slowly for 3-5 minutes for cooling. Meanwhile, hemoglobin and leukocyte levels were measured in a standard laboratory.

III. RESULTS

Table 1. Data of Internet Addiction

Department	Total of Student	Frequency of Internet Addiction	Percentage
Nursing	279	9	3.23
Midwifery	150	5	3.33
Dental Health	150	16	10.67
Lab. Analyst	102	1	0.98
Environmental Health	145	13	8.96
Pharmacy	160	8	5
Physiotherapy	149	9	6.04
Nutrition	150	7	4.67
Total	1285	68	5.29

Table 1 shows that there were 5.29% of students who experience IA in the above-average category.

The mean value of subjects experiencing IA in the above-average category was 56.61 with SD 4.3 with the lowest score of 50 and the highest of 69. The average leukocyte level was 8.82 103 / μL with SD 2.48 103 / μL, with the lowest score 3.52 103 / μL and highest 16.00 103 / μL. The mean hemoglobin level was 13.07 g / dl with SD 1.36 gr / dl, with the lowest value of 8.70 g / dl and the highest 15.60 g / dl. The average VO2max was 21.87 ml / kg BW / min with SD 0.89 ml / kg BW / min, with the lowest value of 20.40 ml / kg BW / min and the highest 23.95 ml / kg BW / minute.

After testing the normality of data using Kolmogorov-Smirnov test, then testing the relationship between IA with physical fitness, hemoglobin level and leukocyte level using Pearson Correlation test, with results as presented in Table 2.

Table 2. The Results of Pearson Correlation Test

Internet Addiciton	r	p
Leukocytes	-0.263	0.046
Hemoglobin	-0.055	0.682
VO$_2$max	-0.180	0.177

Table 2 shows that the overall correlation coefficient was negative, so it could be interpreted that the higher the internet addiction condition, the lower the physical fitness, hemoglobin level and the leukocyte level of the students. However, the results of hypothesis testing with significant results (p value <0.05) was only on the relationship between internet addiction with leukocytes levels.

IV. DISCUSSION

The higher the internet addiction condition, the lower the physical fitness, hemoglobin level and the leukocyte level of the students. However, the results of hypothesis testing with significant results was only on the relationship between internet addiction with leukocytes levels.

Based on the results of data analysis can be said that the condition of internet addiction with various accompanying characteristics can affect the biological changes in the body, especially leukosit. The role of internet addiction in leukocyte changes seems to be related to factors that affect leukocyte levels such as body condition with stress, lack of eating, and lack of activity. In this case, the leukocyte level is lower at rest. This can be seen in the changing life style that occurs in adolescents with internet addiction such as not being able to control, reduce and stop the use of the internet; too engrossed to use the internet to have problems with friends, work, family and school; so it can cause stress that affects the quality of health, lack of sleep, lack of nutrition and lack of physical activity.

It seems that internet addiction is also associated with certain conditions such as chronic anemia, malnutrition or anaphylaxis. In addition, the condition of internet addiction that has a tendency to experience lack of physical activity will certainly have an impact on the decreased stimulation of cardiopulmonary and musculoskeletal system function. The relationship between heart-respiratory function and healthy-fit with physical activity is the optimal functioning of the heart-breathing system. Increased heart-respiratory function will increase work efficiency by decreasing heart rate, increasing stroke volume, and improving the ability of blood to transport oxygen to muscle tissue at work (Lauralee, 1999) because the key to endurance in doing the exercise is oxygen consumption (Niemen C David, 1993). The body needs oxygen to produce energy. Oxygen can not be stored, so it must exist and always remain in the organ or tissue, so the best way of measuring fitness is to know the oxygen consumption with the indicator of maximal oxygen volume (VO2max). Although the hypothesis testing found a weak relationship between internet addiction and VO2max, but there is a negative correlation between internet addiction and VO2maks which shows that the higher the internet addiction, the lower the VO2max. The condition of internet addiction if sustained can have an impact on the decrease in VO2max as a result of the lack of stimulation in the cardiopulmonary and musculoskeletal system, so that it can decrease the quality of the students as adolescents who have to complete various developmental tasks as individuals grow up. Therefore, it is necessary for the physical fitness of students can be increased as capital in carrying out the developmental tasks that are undergoing.

On the other hand, the weak link between internet addiction and hemoglobin levels does not seem to explain the effect on one's health. This condition is certainly not separated from factors that affect hemoglobin levels in the body such as the adequacy of iron in the body (foods containing iron in large quantities), iron metabolism in the body, acidity, partial pressure of oxygen, partial pressure of carbon dioxide and temperature in cell environment. Among several factors affecting hemoglobin levels, it seems that some factors related to internet addiction at levels above average have an opportunity to influence hemoglobin levels. Some of these factors include the adequacy of iron in the body and iron metabolism in the body, which of course associated with nutrient intake. The body's need for nutrients is certainly influenced by the quality of related nutrients and stimulation of the iron requirement in the student body with internet addiction. Levels of heterogeneity affecting hemoglobin levels have a tendency to have an effect on hemoglobin levels, given that internet addiction students with reduced sleep time will have an impact on carbon dioxide levels that could affect the acidity of the cell environment, also affecting hemoglobin levels. The high acidity of the cell environment will certainly affect the affinity of hemoglobin to oxygen so that oxygen saturation will decrease as a result of the accumulation of residual metabolism that has not been wasted optimally. While the temperature factor does not seem to contribute to changes in blood hemoglobin levels, given the internet addiction has a tendency to lack activity so as not to affect changes in metabolism or cell environments.

V. CONCLUSION

Internet addiction among students of the Health Polytechnic of the Ministry of Health in Makassar significantly affected the decrease in leukocyte levels in the blood. This can make them more susceptible to health problems because leukocytes are part of the immune system.

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