Internet Addiction among Indonesia University Students: Musculoskeletal Symptoms, Physical and Psychosocial Behavior Problems

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Abstract. The explosive growth of the internet has led to pathological use, also known as internet addiction. A lot of countries have reported increased number of internet addiction among teenagers and the negative effects of it. Purpose of this study is to observed prevalence of internet addiction and the musculoskeletal symptoms (MSS), physical, and psychosocial behavior problems among sample of Indonesian university students. Seven hundred and fifteen Indonesian university students (mean age = 20.9 year, SD = 2.52 year, 290 female) participated voluntarily in this study by filing out a set of questionnaires consist of internet addiction test (IAT) questionnaire, Nordic body map to observe MSS, and a questionnaire about physical and psychosocial problems. The prevalence of internet addiction among Indonesian university students were 3.2 %, whereas 61% of the samples were categorized as having problem with internet. As predicted, higher internet addiction was accompanying with higher MSS. Most participants (> 50%) were reporting MSS in upper neck, lower neck, right shoulder, back, and waist. higher internet addiction also shows higher physical and psychosocial behavior problems. This study confirms number of general prevalence of internet addiction in teenagers. Result of this study also strengthen the fact of negative effects of intense use of internet not only for physical and musculoskeletal, but also for psychosocial wellbeing.

Keywords: internet addiction, musculoskeletal, disorder, Nordic body map, psychosocial

1. Introduction

The internet, which originally designed for communication and research activity, shows dramatic increase in term of user for decades. Recently, internet is not only used for communication and searching information, but also used for social entertainment (games, songs, and video) and shopping [1]. Moreover, internet is also used as a psychological way to relieve depression through getting rid of bad mood and exchange of funny messages or jokes [2].

The explosive growth of the internet has led to pathological use, also known as internet addiction. Internet addiction can be defined as inability of individual to control the use of the internet, which eventually causes difficulties in a person’s life [3]; [4]. Another study defined internet addiction as too much dependency on internet use [5]. In general, internet addiction is characterized by an excessive and uncontrollable behavior to be involved in internet activities that lead to several consequences [6].

Internet addiction have been associated with various problems, such as academic and professional problems and lack of sleep [7], psychiatric symptoms [8], psychological problem [9], behavioral
problems [10], psychological well-being [11], educational harms like wasting of time [12], decrease in academic performance [13], and communication problems with peers [14]; [15]. Moreover, in the worst condition, the internet addiction requires professional intervention to cure [16].

Problem of internet addiction are commonly found in young people (i.e., teenagers and young adult) or millennial generation (defined as adults ages 18 to 29, [17]). It is because the internet user are mostly teenagers and young adult, in contrast with elder people who reluctant or low in the use of internet. The commonly found of internet addiction among teenagers is coupled with the fact that they are more vulnerable than mature adults to the harmful effect of different kinds of addiction such as internet addiction [14].

The prevalence of internet addiction among teenagers has been reported in both developed and developing countries with various magnitude. In developed countries, Kormas [18] state a number of 1.5% of internet addiction among teenagers in Greek, Kaltiala-Heino [19] found 1.6% in Finnish, Liu [20] state a number of 4% among US adult; 3.7% in UK[21]; and 3.9% in Italian [22]. The number is even higher in developing countries, for example 8% in China [23], 10.7% in South Korea [24], and 8.5% in Jordan [25].

Indonesia, one of the emerging developing countries has been facing explosive use of internet as well. In 2016, The Association of Internet Service Providers in Indonesia (APJII) announced that internet penetration in Indonesia has now reached 40 percent of the population, or 100 million of internet users (http://www.indonesia-investments.com/id). Most of the internet user are teenagers including university students. However, research about internet addiction in Indonesia is very limited, even zero. However, effort to observe similar kind of addiction in relation with computer matter, not specifically with internet user, has been started to be investigated [26].

Purpose of this study is to observe prevalence of internet addiction among Indonesian university students. In addition, this study also aimed to assess effect of the internet addiction to Musculoskeletal symptoms (MSS), physical, and psychosocial behavior problem of internet addiction.

2. Method

Seven hundred and fifteen Indonesian university students participate in this study voluntarily (mean age = 20.9 year, SD = 2.52 year, 290 female) by filling out a set of questionnaire. Participants were selected based on convenience sampling. A paper-and-pencil survey was used that include sections of demographic data, internet use, internet addiction, psychological, psychosocial, musculoskeletal disorder. Overall, 15 minutes were needed to complete the whole questionnaires. The demographic data include age and gender of the respondents were captured. Respondents were also asked to state the frequently and place where they used the internet and whether they are supervised when using it. In addition, pictures of the number of hours spent on the internet a week and most predominate online activity were also figured out. The form of the online activities that were assessed divided into: information search on the internet, online communications (including email, chat rooms), and online games (see Chak and Leung 2004 for reason of dividing the online activities).

Internet Addiction Test (IAT, [27]) was used in this study. The IAT consist of 20 items using 5-point Likert scale ranging from 1 (not at all) to 5 (always). The internet addiction test questionnaire was adapted into Indonesian, following back translated procedure proposed by International Commission Test (ICT, see [28]; [29]; [30] for examples). First, two Indonesian bi-lingual with TOEFL score minimum of 550 was translating the original version of the IAT questionnaire (in English) into Indonesian. The best Indonesian version was decided based on the two Indonesian versions through consensus of authors. Later, third bilingual Indonesian person was back translating the Indonesian version into English in which this person has never seen the original version of the IAT questionnaire. Finally, the original and back-translated version of the IAT questionnaire was compared, necessary revision to the Indonesian version was conducted by authors if needed. The IAT items covers psychological dependence, tolerance, compulsive use and withdraw, as well as problems related to school, sleep, family, and health/time management. The final score of IAT fall between 20 to 100.
The IAT score were categorized as average user for score of 20-39, frequent problems due to internet usage for 40-49, and addict use of the internet for score of 70-100 [27].

To observe musculoskeletal symptom, Indonesian version of Nordic body map questionnaire [31] was used. The questionnaire allowing comparison of low back, neck, shoulder and general complaints for use in epidemiological studies. The original questionnaire consists of 40 items identifying areas of the body causing musculoskeletal problems. A body map is available to assist respondents to indicate nine symptoms of musculoskeletal disorder in the neck, shoulders, upper back, elbows, low back, wrist/hands, hips/thighs, knees and ankles/feet. Four likert scale ranging from 0 (not hurt) to 4 (very hurt) is used to capture the level of MSS suffer by the participants.

Physical and psychosocial behavior problem is observed by [32] questionnaire that is intended to assess the influence of internet addiction on daily life. The physical behavior problems are assessed with 10 questions including nutrition sleeping, and activity behavior, whereas psychosocial behavior problem is assessed using 12 questions in relation with friend and family relations. The responses to the questions are 1 (never), 2 (sometimes), and 3 (always).

3. Results
Socio-demographic of participants and the use of internet as well as prevalence of internet addiction among Indonesian university students can be seen in Table 1.

| Demographic data                                      | All (N=715) | Male (N = 425) | Female (N = 290) |
|-------------------------------------------------------|-------------|----------------|------------------|
| Age (mean, SD)                                        | 20.90 (2.52) | 20.88 (2.90)   | 20.87 (2.53)     |
| Internet addiction category:                          |             |                |                  |
| - Average user                                        | 256 (35.8%) | 142 (34.9%)    | 113 (38.6%)      |
| - Frequent problem                                    | 436 (60.9%) | 246 (60.4%)    | 177 (60.4%)      |
| - Internet addict                                     | 23 (3.2%)   | 19 (4.7%)      | 3 (1.0%)         |
| Duration of internet use (in hours) based on           |             |                |                  |
| internet addiction category (mean, SD):                |             |                |                  |
| - Average user                                        | 7.74 (4.52) | 7.58 (4.87)    | 7.94 (4.05)      |
| - Frequent problem                                    | 8.42 (4.41) | 7.99 (4.17)    | 9.05 (4.68)      |
| - Internet addict                                     | 11.48 (4.73)| 11.15 (4.85)   | 13.67 (3.79)     |
| Prevalence of MSS (reported by participants for all 28 body parts) based on internet addiction category (mean, SD): |             |                |                  |
| - Average user                                        | 11.55 (9.76)| 10.97 (10.09)  | 12.28 (9.33)     |
| - Frequent problem                                    | 14.46 (11.72)| 13.81 (11.78)  | 15.41 (11.59)   |
| - Internet addict                                     | 23.35 (19.79)| 21.45 (20.09)  | 36.00 (14.00)   |
| Internet use for:                                     |             |                |                  |
| - Academicals matters                                 | 619 (86.57%)*| 355 (87.22%)   | 252 (86.01%)     |
| - Social media (chat, blog, ig., fb.)                  | 472 (66.01%)| 228 (56.02%)   | 236 (80.55%)     |
| - Entertainment (music, video, game)                   | 593 (82.94%)| 347 (85.26%)   | 233 (79.52%)     |
| - Online shopping                                     | 14 (1.96%)  | 9 (2.21%)      | 5 (1.71%)        |

*Note. Percentage from total answer in the specific category, one participants can give more than 1 answer.

Further statistical analysis was conducted using SPSS for windows version 20. ANOVA shows that there are no significant differences between male and female participants on age, duration of internet use, and prevalence of MSS (all \( p > 0.01 \)). Overall, female participants reported longer duration of internet use and prevalence of MSS. In-depth analysis based on internet addiction categories reveals significant differences among the three categories of user (i.e. average user, frequent problem, and
internet addict) on internet duration of use ($F(2, 714) = 7.99, p = 0.01, \text{MSE} = 19.91$) as well as prevalence of MSS ($F(2,714) = 13.73, p = 0.01, \text{MSE} = 130.14$).

Prevalence of MSS in each part of the body in relation with level of internet addiction can be seen in the Figure 1.

![MSS due to internet use](image)

**Figure 1.** Prevalence of MSS among Sample of Indonesian University Students.

*Note.*

1. Upper neck
2. Left shoulder
3. Left upper shoulder
4. Right upper shoulder
5. Hip
6. Left elbow
7. Left lower shoulder
8. Left wrist
9. Left hand
10. Left thigh
11. Left knee
12. Left calf
13. Left ankle
14. Left sole
15. Nape
16. Right shoulder
17. Back
18. Wrist
19. Buttock
20. Right elbow
21. Right lower arm
22. Right wrist
23. Right hand
24. Right thigh
25. Right knee
26. Right calf
27. Right ankle
28. Right sole

The reported physical and psychosocial behavior problem can be seen in Table 2.

**Table 2. The Physical and Psychosocial Behavior Problems in Relation with Internet Use**

| No | Physical Behavior Problems                                                                 | Never | Sometimes | Always |
|----|-------------------------------------------------------------------------------------------|-------|-----------|--------|
| 1  | Recently, I’m having sleeping problems                                                     | 33%   | 48%       | 19%    |
| 2  | There are times when I go to bed late of the Internet                                      | 22%   | 66%       | 12%    |
| 3  | There are times when I skip or delay meals when I am online                                | 39%   | 52%       | 9%     |
| 4  | There are times when I eat my meals in front of the computer                               | 11%   | 65%       | 23%    |
| 5  | I eat snacks (e.g. junk food) when I play games on the computer                           | 35%   | 53%       | 12%    |
| 6  | My body hurts due to the long period of internet use                                       | 14%   | 59%       | 28%    |
| 7  | I have eye problem due to the long period of internet use                                  | 23%   | 53%       | 24%    |
| 8  | I play sports in real life instead of sports games on the Internet                         | 16%   | 43%       | 40%    |
| 9  | I play active games with my family and friends                                             | 16%   | 58%       | 26%    |
| 10 | When I spend time on the Internet or on the computer for a long time, I go on although I am aware that my body receives radiation | 10%   | 50%       | 41%    |
Table 2. The Physical and Psychosocial Behavior Problems in Relation with Internet Use (cont.)

| No | Psychosocial Behavior Problems                                                                 | Never | Sometimes | Always |
|----|------------------------------------------------------------------------------------------------|-------|-----------|--------|
| 1  | The Internet decreases my relationships with family/friends                                    | 39%   | 51%       | 9%     |
| 2  | Apart from the Internet and computer games, I spend time with my family with various activities| 7%    | 45%       | 47%    |
| 3  | I can easily strike up communication and make friends with others on the Internet              | 20%   | 48%       | 32%    |
| 4  | I argue with my parents about the time I spend on the Internet                                 | 70%   | 27%       | 3%     |
| 5  | I prefer to spend time on the Internet instead of spending time outside with others             | 49%   | 45%       | 6%     |
| 6  | In everyday life (e.g. at school, in the street, hanging around, etc.) I can easily strike up communication and make friends. | 7%    | 52%       | 40%    |
| 7  | When there is no internet in my life, my life becomes boring                                   | 35%   | 50%       | 15%    |
| 8  | When somebody disrupts me when I am on the Internet, I feel anger and resentment for that person| 79%   | 20%       | 1%     |
| 9  | I suffer from conditions such as restlessness, heart palpitations, or tremors when I cannot connect to the Internet | 85%   | 12%       | 3%     |
| 10 | Nowadays, I feel unhappy, alone, and uneasy                                                    | 55%   | 36%       | 9%     |
| 11 | When I play Internet/computer games for a long time, I have annoying or frightening thoughts in my mind before I sleep | 59%   | 33%       | 8%     |
| 12 | There are times when I go to school without doing my homework because I play games on the computer for a long time | 61%   | 36%       | 3%     |

Additional analysis using ANOVA is applied to observe the influence of internet addiction category to physical and psychosocial behavior problems (based on average value of all statements of physical and psychosocial behavior problems). Significant differences are found in both physical and psychosocial problems based on different internet addiction level \((F(2,707) = 53.87, p < 0.001, MSE = 458.33\) and \((F(2,707) = 87.23, p < 0.001, MSE = 773.22\) for physical and psychosocial behavior problem respectively). Analysis of each statement of physical and psychosocial behavior problems based on internet addiction category reveals similar pictures of significant differences of each statement (all \(p < 0.01\)). As expected, higher internet addiction category shows significant higher physical and psychosocial behavior problems.

4. Discussion

Aim of this study is to observe prevalence of internet addiction among sample of Indonesian university students and its effect in musculoskeletal symptoms, physical and psychosocial behavior problems. Result shows that prevalence of internet addiction among sample of Indonesian university students was about 3.2%. This result is congruent with results of previous studies in relation with the prevalence of internet addiction in both developed and developing countries. Furthermore, result of this study is also in line with the fact that Indonesians ranked as the world's most addicted smartphone using population, spending on average more than three hours a day on the devices, on average of 181 minutes a day, according to a recent study by Millward Brown AdReaction [33].

Significant gender differences in internet addiction was found in this study. The proportion of male participants addict to internet is higher than those of female participants (4.7% vs. 1.0 % for male and female participants respectively). Furthermore, female participants show slightly higher internet duration in all category of internet use (normal, problem and addict) than male participants. Previous studies found mixed result in relation with gender differences in internet duration of use. Lam [33] and Gur [32] found that male tent to spend longer time in internet than female. However, another study reported no gender differences in internet addiction and duration of internet use [35]. The mixed result can be explained based on the different use of internet between male and female. In this present study, beside academic matter, female spent time on internet in using social media whereas male spent time on internet on entertainment (i.e., games). As stated by Gur [32] in general, the differences between male
and female in internet addiction was caused by the fact that male students were playing online games and technology more than female student, and the fact that males students percept computers as toys.

5. Conclusion
This present study shows that there is a relation between internet use and MSS. As predicted, the higher the level of the internet addict, the higher MSS that are reported. The most body parts that suffer from MSS due to internet use are upper neck, lower neck, right shoulder, back, and waist. As far as acknowledged by authors, only limited study is observed the relation between them. An exception is a study conducted by Dol’ [36] who observed fatigue and pain related to internet usage. The study found that regions with highest fatigue scores are eyes, neck, and shoulder, whereas regions with highest pain scores are neck, shoulder, and waist. Thus, this present study is in line with result of Dol’ study.

With regards to the internet addiction and physical and psychosocial behavior problem, result of this present study support result of previous study such as studies conducted by Yeonsoo [37] and Cao and Su [38] who stated that internet addiction decreased physical activities. In this present study, most participants reported excessive time in front of computer using internet, thus decreasing their physical activities. They often skip meal time or having meal in front of computer as well as reported pain in several parts of the body. In relation with psychosocial behavior problem, the present study is supporting the previous studies in which internet addiction is related with psychological problem [38], behavioral problems [10], as well as psychological well-being [11].

This study has several limitations. First, there is a possibility of response bias due to self-report questionnaire of IAT. Although multiple assessment by means of clinical procedure may minimize the bias, the self-reported questionnaire give advantage in its easy of use and practicability in assessing a large number of respondent. Second, assessment of internet addiction was only conducted in urban area of Indonesia. There is a mixed result in the differences between urban and rural area in internet addiction, in which some studies found the differences (e.g., [39]; [40]) whereas other studies do not ([41]; [6]). There is a possibility that similar findings will be found. Therefore, assessment of internet addiction in rural area of Indonesia is worth to conduct.

In sum, this study shows prevalence of internet addiction among Indonesian university students. Despite the limitations mentioned above, this present study act as a first step in observing prevalence of internet addiction among Indonesian university students. Consistent with literature, this study confirms number of general prevalence of internet addiction in teenagers. Result of this study also strengthen the fact of negative effects of intense use of internet not only for physical and musculoskeletal, but also for psychosocial wellbeing. Result of this study is fruitful as a step in advance understanding about the effect of internet addiction as well as prevention of internet addiction and its negative effects.

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