Association between Smartphone Addiction and Physical Activity, Sleeping Hours among Medical Science Students in Duhok City

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ABSTRACT

Background and Aim: Smartphones become a part of today’s life. In spite of the convenience, it contributes to our daily lives and activities, one of the most important problems is smartphone addiction. As known, smartphone addiction is a type of technological addiction or non-substance addiction. The present study is to investigate the association between smartphone addiction and physical activity, sleeping hours among medical science students in Duhok City.

Subjects and Methods: A cross-sectional study design carried out with 295 students in medical science colleges in the Duhok City of both gender. Self-reported data collected from December 15, 2019, to January 22, 2020. Structured questionnaire has been used to gather data related to sociodemographic, physical activity, sleeping hours, and smartphone addiction.

Results: The study found most students, 78.3% have smartphone addiction, 78% of medical science students are at low physical activity range, and only 2% of students are at normal physical activity range, also revealed 20% of students were inactive. According to daily sleeping hours, more than half of them, 61.7% were in a healthy range of sleeping; however, no statistically significant association found between smartphone addiction with physical activity, sleeping hours while finding a highly statistically significant association between smartphone addiction with gender.

Conclusion: The current study figure out smartphone addiction prevalence was very high among medical science college students. Smartphone addiction showed an effect in increasing sedentary health behavior like low physical activity and poor sleeping quality with no statistically significant association.

Keywords: College students; Medical science students; Physical activity; Sleeping quality; Smartphone addiction

INTRODUCTION

Smartphones are not just communicating devices like mobile phones, but additionally became so common and the main platforms for information collection and acquiring for modern people. There were 2.5 billion smartphone users around the world at the end of 2016 and this total reached to 3.5 billion users by April 14, 2020, and predicted to reach 3.8 billion by 2021 (Statista, 2020). Significant increase of Smartphone using and their capabilities enable all people to access the internet, communicate, and entertain themselves anywhere and anytime. Individuals can become addicted to various substances such as drugs or alcohol, also they can suffer from behavioral addictions, like addiction to computers, games, television, shopping, and the internet and the excessive use of smartphones encompass many features have raised the issue of smartphone addiction (Demirci et al., 2015). Although, as early as 1982, before the widespread use of mobile phones, it was suggested that techno-dependence may form from pathological use of technology, in recent years, concern regarding problematic mobile phone use has been increasing. However, behavioral addiction does not involve the use of a chemical substance, in general terms, both may be described as disorders involving a loss of control over a compulsive, resource and time-consuming behavior, which persists in spite of adverse consequences and characterizes by a continued escalation of behavior or withdrawal symptoms when engagement in the behavior is reduced (Alosaimi et al., 2016). The development of smartphones made dramatic changes in societies around the world; in addition, it has transformed communication among individuals of all ages. Smartphone is one of the best devices that have integrated “communication, entertainment, and education,” it seems the famous idiom “to have the world within the palm of your hand” is the best characterization of smartphones

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Increase usage of smartphone addiction lead to physical health-related issues, such as musculoskeletal disorders of the hand, cervical spine, wrist, back muscles, ocular manifestations, and increasing risk of psychological disorders such as attention deficit, aggression, and disturbance of sleep (Yang et al., 2010). While smartphone use across all sectors has been increasing, university students have been seen as the largest group of smartphone services consumer (Hong et al., 2012). Students use smartphone for several purposes, for instance, to explore applications which provide new functions, to communicate with others face to face, enjoy with deferent kinds of entertainments like games, and help students to escape from uncomfortable situations; hence, smartphones become vital to them (Head and Ziolkowski, 2012). The aim of the current study was to determine the association between smartphone addiction with physical activity and sleeping hours among medical science students in Duhok City.

**SUBJECTS AND METHODS**

**Study Design**

This study was a descriptive cross-sectional study design.

**The Setting of the Study**

The present study done in Duhok City in five Medical Science Colleges (Medicine, Nursing, Dentistry, Pharmacy, and Health Sciences).

**Time of the Study**

The present study conducted from December 03, 2019, to March 08, 2020.

**Sampling Methods and Sample Size**

A cluster-stratified-simple random sampling applied to reach 295 students from all classes of selected medical colleges.

**Data Collection**

Data of the present study collected using the questionnaire, which includes (sociodemographic data, questions related to smartphone addiction, physical activity, and sleeping hours). Data were collected through the direct interview technique with students to fill the questionnaire. The first part of the questionnaire purposed to collect sociodemographic characteristic of students, physical activity, and sleeping hours. Normal sleeping hours ranged between 7 and 9 h daily, according to Sleep Foundation (Hirshkowitz M, et al., 2015). Also, the physical activity set in four categories: inactive, low active, moderate and high active (WHO, 2010; US. Department of Health and Human Services, 2008). The second part aimed to assess smartphone addiction which has been assessed using the SAS-SV, which constructed by South Korean researchers (Kwon et al., 2013). We used cutoff values of 31 and 33 for male and female study participants, respectively. The scale for addiction depended on a 6 Likert scale. We utilized the already published short version of smartphone addiction scale (SAS) questionnaire which consists of 10 questions with response choices from 1 to 6, where 1 is considered strongly disagree and 6 is considered strongly agree. The total responses of participants were calculated and compared to cutoff points of 31 for males and 33 for females. Study participants who scored higher than the cutoff points were considered to be addicted to smartphone.

**Data Analysis**

The data analyzed using Statistical Package for Social Sciences (SPSS) (v 23). Descriptive data analyzed as frequency, percentage, mean, standard deviation, and inferential statistical data analysis using Fisher Exact test and Chi-square test as appropriate to investigate the relationship between SA and physical exercise, sleeping hours among medical sciences students in Duhok City.

**Ethical Considerations**

The ethical approval had been taken from the ethical Committee of General Directorate of Health in Duhok City and document consent had been taken from all selected College’s administrations and verbal consent from students who agree to participate in the current study.

**RESULTS**

**Sociodemographic Characteristics of the Students**

Regarding the distribution of sociodemographic characteristics among medical science colleges, Table 1 shows that age group 18–20 is the highest age group percentage rate among study samples, which is 47.1% of total sample age; however, 24–26 age group is the lowest age percentage rate 9.5% among study age groups. Concern for gender, the table reveals the majority of study samples were male, about 51.2%. The majority of study samples were at first and fourth class 23.4–23.4%, respectively, while 3.7% of them were at sixth class.
Distribution of Physical Exercise and Sleeping Hours among Medical Science Students

In respect of the distribution of physical exercise and sleeping hours among medical science students, Table 2 shows that most of the students, 78% were at a low physical activity level, and only 2% of students were at the moderate physical activity level; also, the table reveals 20% were inactive. Concerning to daily sleeping hours more than half of students, 61.7% were in healthy level of sleeping. Concerning to daily sleeping hours more than half of students, 61.7% were in healthy level of sleeping. While nearly 40% of students had poor and unhealthy sleep quality, poor quality and unhealthy sleep (32.5% and 7.4%), respectively.

Smartphone Addiction Rate among Students

As regards distributing the smartphone addiction rate among medical science students, Table 3 shows more than third-to-fourth of students, 78.3% have smartphone addiction, while 21.7% are non-addict.

Association between Smartphone Addiction with Physical Activity

Concerning the association between smartphone addiction and physical activity, Table 4 reveals that most of the smartphone addiction students were in a low level of physical activity. However, there was no statistically significant association ($P = 0.107$).

Association between Smartphone Addiction with Sleeping Hours

About the association between smartphone addiction with sleeping hours among medical science students, Table 5 reveals no statistically significant association between smartphone addiction and sleeping hours among students ($P = 0.384$).

Association between Smartphone Addiction with Gender

Regarding gender and smartphone association, Table 6 shows a high smartphone addiction rate between both gender and shows a highly statistically significant association between gender and smartphone addiction ($P = 0.001$), which shows that the male is more addict to smartphone than female 53.6%–46.4%, respectively.

DISCUSSION

The current study finding showed that majority of medical science students were at age group (18 years–20 years) than other age groups, concerning to gender among students the present study findings revealed that more than fifty percent, 51.3% of medical science students were female; also, present study results showed that both first and fourth class had majority percent than other classes 23.4% and 23.4%, respectively.

Regarding the prevalence of smartphone addiction, the current study showed that the majority of students 78.3% had smartphone addiction. One of the reasons for this high prevalence could be that a lot of educational material is available on the internet, and students feel more comfortable using a smartphone than a laptop or desktop computer. Similar to our current study findings, other studies done in Saudi Arabia by Venkatesh et al., in 2016, among dental college students revealed that smartphone addiction was 71.9%. In another study in India by Kumar et al., among 150 medical students, 67 44.7% were addicted to smartphone usage (Kumar et al., 2019); however, another study done in China by Chen et al., 2017, they found the smartphone addiction was low among medical students of China 29.8% (30.3% in males and 29.3% in females). Other studies done on SA among medical students by Basu et al. in 2018 found that 40.2% of undergraduate medical students at a Medical College in Delhi were addicted to
smartphone; Alhazmi et al., 2018 and Jain et al., 2019 showed less SA prevalence of smartphone addiction comparing to current study findings, they found 24.65% of students were addicted.

Regarding gender and SA association, the current study showed high addiction prevalence between both gender and showed highly significant association between gender and smartphone addiction which revealed that male students are more addict to smartphone than female students. Same results found by Hasan et al. in 2018 in Kirkuk university among Nursing students; also, Alosaimi et al., 2016; Dixit et al., 2010; Alhazmi et al., 2018; Ammati et al., 2018; and Bisen and Deshpande, 2016 found that smartphone addiction was higher in male than females participants students. However, disagree to our current study findings, some studies reported that female has a higher prevalence of smartphone addiction than males (Demirci et al., 2014; De-Sola et al., 2016; Jain et al., 2019; Tavakolizadeh et al., 2014). On the other hand, studies done by Alosaimi et al., 2016; Bounmosle and Jaalouk, 2017; they found no association between SA with gender difference.

Concerning SA and sleeping hours association, the present study revealed that approximately 40% of smartphone-addicted medical science students had poor quality and unhealthy sleep (32.5% and 7.4%), respectively; however, the current study showed no statistically significant association between SA and sleep hours among medical science students, similar findings in study done by Basu et al., in 2018, among medical students found 40.2% of excessive smartphone user students reported reducing hours of sleeping; also, Soni et al., 2017; Alosaimi et al., 2016; and Hysing et al., 2015 found that excessive use smartphone may lead to poor sleep quality and sleep disturbances and decreasing sleep hours. Moreover, other researchers, Lemola et al., 2015, found excessive use of smartphone at night could affect one up late. In contrast to our study results, studies done by Kurugodiyavar et al. in 2018 and Ibrahim et al. in 2018 found that smartphone addiction had a significant association with poor sleep quality.

Our study revealed most of the smartphone addiction students were in a low level of physical activity. However, there was no significant association between SA and physical activity. Similar to our study results, Penglee et al. in 2019 found smartphone addiction among US students was not associated with less physical activity but differ from our study results they found excessive smartphone use per day was found to be associated with fewer days per week of engaging in physical activity among the Thailand students. The same results by Barkley and Lepp, 2015 showed no relationship was found between smartphone use with physical activity among college students in a Midwestern US University. Furthermore, other researchers, Barkley and Lepp, 2016; Rebold et al., 2016, supported the argue that use of a smartphone during physical activity may lead to reducing the intensity of physical activity. Moreover, Lepp et al. in 2013 reported leisure-time physical activity disrupted by cell phone use.

**CONCLUSION**

The current study concluded that there was a high smartphone addiction rate among medical science students in Duhok City, and smartphone addiction may increase sedentary health habits, also it associated with...
gender differences. The present study recommended to keep attention on the SA and its associated sedentary behaviors by educating and discussing current study data with students and make more studies on a psychological aspect related to smartphone addiction among medical science students.

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