Relationship between Internet Addiction and Obesity and the Predictive Role of Emotion Dysregulation

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Research Article

Keywords: Internet, Obesity, Emotion Dysregulation, Addiction, Internet Addiction

Posted Date: November 28th, 2022

DOI: https://doi.org/10.21203/rs.3.rs-2269758/v1

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Abstract

**Background:** In recent decades, with the significant developments in technology, the Internet has become a main part of peoples' lives. The widespread use of the Internet has raised significant concerns about problematic Internet behaviors and their consequences. This study aimed to examine if Internet addiction significantly predicts obesity and whether Internet addiction and obesity are significantly predicted by emotion dysregulation.

**Methods:** 367 school-attending adolescents (M age = 13.35; SD = 0.82; 49% girls) in Tekab were recruited and completed the Difficulties in Emotion Regulation Scale (DERS) and Internet Addiction Test (IAT) measures, while their BMI scores were calculated to examine the participants' obesity levels.

**Results:** The results indicated that Internet addiction significantly predicted obesity, while they both were significantly predicted by emotion dysregulations.

**Conclusion:** Our findings could be informative for clinicians working with individuals suffering from Internet addiction and obesity.

Background

Over the recent decades, technological developments have fundamentally shaped the role of the Internet in our lives (e.g., 1). The Internet has become an integral part of people's daily living across school, work, and leisure (2). This widespread use of the Internet has raised significant concerns about problematic Internet behaviors and related conditions. In this regard, Young (3) indicated that an individual could be diagnosed with Internet addiction if he/she excessively uses the Internet for leisure over six months and meets at least five of the eight diagnostic criteria. Likewise, a novel diagnostic condition, namely the "Internet Gaming Disorder (IGD)," has been suggested to be included as a condition for further study in the latest edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; APA, 20134). Overall, excessive use of the Internet has adverse effects on mental health (e.g., 5, 6). Internet addiction is significantly associated with low life satisfaction (e.g., 7), poor academic performance (e.g., 8), depression (e.g., 9), social anxiety (e.g., 10), poor work performance, insomnia, and suicide ideation or commitment (e.g., 11, 12). Notwithstanding, one of the most important consequences of excessive Internet use is the negative changes in body fat distribution, increase in body weight, and obesity (13, 14). Obesity could directly or indirectly cause various chronic diseases and has high costs both individually and socially; thus, it has become a prioritized matter within the scope of protecting and improving health. About 80% of the world's adolescent population does not make adequate physical activity. Sitting for a long time during Internet use could be one of the reasons explaining sedentary behaviors among adolescents. The addition of nutritional habits such as snacks, eating, and drinking to the time spent in front of a screen sitting in a fixed position continuously increases obesity risk. Moreover, Internet use may have increased during the COVID-19 pandemic, and probably the lockdowns and social strategies implemented to oppose COVID-19 might have long-term, adverse effects on the obesity epidemic.
Notwithstanding, while several studies have examined the relationship between Internet use and the odds of overweight and obesity, the results are inconsistent (For a review, see 15). Therefore, more studies are needed to the association between Internet use and obesity to enrich the literature on the subject.

In addition, studies suggest the role of emotion regulation difficulties in various pathologies. Emotion regulation (ER) refers to the ability to adjust emotional arousal and accomplish goal-directed behaviors regardless of emotional state; deficits in ED lead to difficulties in monitoring, evaluating, or adjusting emotional reactions (16, 17). Prior studies have suggested the etiological role of ER deficits on obesity (18, e.g., 19) and Internet addiction (20, e.g., 21). Still, the relationship between the ED deficits and Internet addiction has been debated. For instance, Donald et al. (22) did not find evidence that emotion regulation difficulties preceded the development of compulsive Internet use and suggested that teaching general emotion regulation skills may not be as effective in reducing compulsive Internet use.

All these taken into account, the present study was conducted as an attempt to provide answers to the inconsistencies in the literature. In this vein, we first examine if Internet use predicts obesity. Then, we explore whether ER deficits significantly predict Internet addiction and obesity.

Methods

Participants and Procedure

Participants were 367 school-attending youth aged 10-14 years (M age = 13.35; SD = 0.82; 49% girls) old who were recruited from schools in Tekab between March 2021 to June 2021. First, one district of Tekab city was selected randomly, and we then randomly chose ten schools from the selected districts. Finally, fifteen classes from these schools were selected randomly, and the questionnaires were distributed to 67 students in the classes. Before gathering data, the students and their teachers were explained about the aims and process of the study. They were then informed about the data's confidentiality and that it would only be used for the present study. After providing their informed consent, participants were asked to fill out the measures, while they could ask questions from the data gatherer if they needed. The participants completed the questionnaires in their classroom during a one-hour session under the supervision of a specially trained research assistant (master-level student). This study was approved by the ethics committee of the Islamic Azad University, Sarab Branch. Also, approval was provided by the Iran Ministry of Education and the boards of each school.

Measures

Internet Addiction Test (IAT)

Internet Addiction Test (IAT) was developed by Young (23) and is the first validated and reliable measure for assessing addictive use of the Internet. IAT has 20 items and measures psychological dependence, compulsive use, withdrawal, and related problems of school, sleep, family, and time management as a
result of addictive internet use. Items are rated on a 5-point Likert type scale ranging from 1 (rarely) to 5 (always). The minimum obtainable score on the IAT is 20, and the maximum is 100, with higher scores indicating a greater level of Internet addiction. Persian version of the IAT yielded acceptable psychometric properties with Iranian samples (1).

**Difficulties in Emotion Regulation Scale (DERS)**

The DERS (17) is a 36-item self-report questionnaire that assesses emotion dysregulation. The DERS items load on six subscales, including Lack of Emotional Awareness (6 items), Lack of Emotional Clarity (5 items), Difficulties Controlling Impulsive Behaviors When Distressed (6 items), Difficulties Engaging in Goal-Directed Behavior When Distressed (5 items), Nonacceptance of Negative Emotional Responses (6 items), and Limited Access to Effective ER Strategies (8 items). Participants rate items on a 5-point scale ranging from 1 (almost never) to 5 (almost always). A total score is obtained by summing all items. The internal consistency and validity of the Persian version of DERS were supported with the Iranian sample in previous studies (24, 25).

**Obesity**

In order to measure obesity, we calculated the BMI scores of the participants according to the following formula: $\text{BMI} = \frac{\text{Weight (kg)}}{\text{Height (Meter}^2\text{)}}$ based on the self-reported data.

**Data Analysis**

We used SPSS 20 software for data entry and statistical analyses. Data were analyzed using multiple regression analysis. For hypothesis testing, we considered $p < .05$ as indicating statistically significant results.

**Results**

To test the study questions, a set of multiple regression analyses was conducted. First, to examine if Internet use predicts obesity, a simple linear regression was carried out. The results of the regression indicated that the model explained .04% of the variance in the outcome variable and that the model was significant, $R^2 = .04$, $F(1,365) = 7.73$, $p < .001$. We further conducted a multiple regression analysis to examine if emotion dysregulation predicts Internet addiction. Our results indicated that emotion dysregulation explains 29% of the variance in Internet addiction, $R^2 = .29$, $F(1,365) = 18.83$, $p < .001$. Finally, we tested whether emotion dysregulation predicts obesity via multiple regression analysis. Our findings supported this predictive relationship, indicating that emotion dysregulation explained 0.027% of the variance in obesity, $R^2 = .027$, $F(1,365) = 10.13$, $p < .001$ (see Table 1).
Table 1
Multiple Regression Analyses of the Study Variables among Adolescents (n = 367).

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Outcome Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
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<tbody>
<tr>
<td></td>
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<td>$B$</td>
<td>$SE$</td>
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<tr>
<td>Internet Addiction</td>
<td>Obesity</td>
<td>.20</td>
<td>.11</td>
</tr>
<tr>
<td>Emotion Dysregulation</td>
<td>Internet Addiction</td>
<td>.46</td>
<td>.12</td>
</tr>
<tr>
<td>Emotion Dysregulation</td>
<td>Obesity</td>
<td>.22</td>
<td>.12</td>
</tr>
</tbody>
</table>

Discussion

In the current study, we aimed to examine whether Internet addiction predicts obesity and if these two variables are significantly predicted by emotion dysregulation. In this regard, results of the multiple regression analyses indicated that Internet addiction significantly predicted obesity, and these variables were significantly predicted by emotion dysregulation.

With respect to the relationship between Internet use and the odds of overweight and obesity, previous studies have yielded inconsistent results (For a review, see 15). For example, Belanger et al. (26) failed to find a significant association between Internet use and overweight among girls. On the other hand, consistent with our results, several studies indicated that adolescents with Internet addiction disorder are more susceptible to being overweight or obese (27–31). The association between Internet use and a sedentary lifestyle could explain this finding; sedentary life is a significant risk factor for overweight and obesity (28). In addition, nutritional habits such as snacks, eating, and drinking during Internet use in a fixed position increase obesity risk (15).

In addition, our findings showed that emotion dysregulation significantly predicted Internet use. Prior studies indicated that disturbed emotion regulation abilities anticipated more elevated levels of internet addiction (32, 33). To explain this finding, the authors indicated that internet use might function as a coping mechanism, which individuals use to cope with negative emotions. In other words, various unfavorable life events may bring about negative emotions, and the incapacity to manage or regulate these emotions may lead to high levels of impulsivity and the development of dysfunctional behaviors such as excessive internet use (34). Finally, in line with previous studies, our results indicated that emotion dysregulation significantly predicted obesity (34, 35). In this regard, studies suggest that eating may comprise a coping mechanism for negative emotions. That is, negative emotions initiate overeating (i.e., eating a large amount of food) or binge eating (i.e., eating a large amount of food with a loss of control) (35), which are directly associated with weight gain and obesity. In this concern, a study showed that juveniles with high ED had significantly higher BMI than their counterparts with low ED levels (36).
Thus, given that EDs are common among Iranian adolescents (37), replicating this study among adolescents with EDs would be warranted.

The current study results should be interpreted concerning a few limitations. First, we used only self-report measures for the data gathering, so correlations between self-report measures may partly be explained by shared method variance. Second, the fact that we only included students from schools located in one city limits the generalization of the results.

Implications For Practice

The current study results indicated that Internet addiction significantly predicts obesity. Likewise, emotion dysregulation predicted Internet addiction and obesity significantly. These findings could be informative for clinicians in working with individuals suffering from Internet addiction and obesity.

Declarations

Ethics approval and consent to participate
This study was approved by the ethics committee of the Islamic Azad University, Sarab Branch. All participants and their parents provided informed consent after being explained about the study's purpose and being assured confidentiality. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Consent to Publish
Not applicable

Availability of Data and Materials
The data analyzed during the current study are available from the corresponding author on reasonable request.

Funding
This study was not financially supported.

Competing Interests
There was no conflict of interest in this study.

Author contributions
MA: performed the data analyses and reviewed and revised the manuscript; BA & HA: gathered the data and reviewed and revised the manuscript. All authors contributed to the article and approved the submitted version.
Acknowledgment

We acknowledge all students who participated in our research.

References


