Association between Internet Addiction and Dietary Habits among Omani Junior College Students

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Abstract

Objectives: To investigate the association between internet addiction and dietary habits among Omani junior college students. Methods: In this cross-sectional study at Sultan Qaboos University, 377 junior college students were surveyed in November 2020 using demographic data, the Compulsive Internet Use Scale, and a dietary habits questionnaire. Chi-square cross-tabulation analyses explored the relationship between internet addiction and dietary habits. Results: Overall, 59.9% of junior college students were identified as having an internet addiction. Within this group, 62.8% reported reduced meal sizes and 54.4% reported a decrease in appetite. There was a statistically significant difference in both meal size ($X^2=30.528$, $p<0.001$) and appetite changes ($X^2=28.731$, $p<0.001$) among student with different levels of internet addiction. These results suggest a possible link between internet addiction and altered dietary habits among this population. Conclusion: This study highlights the need for strategies that encourage healthy living behaviors and raise awareness about the adverse effects of internet addiction.
Introduction

The widespread of internet usage and the growth of digital devices in recent years have significantly changed several aspects of life, including education. This digital revolution has enabled quick communication across great distances, allowing people to stay in touch with friends, family, and coworkers all around the world. Furthermore, the internet has transformed education by providing an abundance of online resources, e-learning platforms, and virtual classrooms. Students can now access a wealth knowledge and skills from the comfort of their own homes using their mobiles. The internet's huge array of entertainment, such as streaming services, social networking, and online gaming, have increased leisure activities. However, the rising frequency of internet addiction has emerged as a major global issue, particularly among younger populations such as junior college students. Internet addiction is defined by compulsive and excessive internet use, which has a negative impact on an individual's physical health, psychological well-being, and social interactions.

Internet addiction can give rise to sedentary behavior and a decrease in physical activity, which may contribute to overweight, obesity, and sleep disruptions. Internet addiction, particularly in the context of digital gaming, can have a substantial impact on individuals' eating habits and nutritional practices. Because of the immersing nature of digital gaming, there is a tendency known as "gaming binge," in which gamers become profoundly absorbed in extended gaming sessions, often disregarding other activities, such as eating.

Several studies have been conducted to investigate the link between internet usage and dietary changes. Hassan et al. studied the dietary habits of Egyptians adolescents suffering from internet addiction problem. According to the study, when compared to their non-addicted peers, these adolescents were more prone to experiencing loss of appetite and eating large meals at a fast rate. In a Pakistani study, Waheed, Jamil et al. found that internet addiction is an increasing issue among university students and
negatively affects their dietary patterns. At a Turkish university, Gündüz, Gokcen et al.\textsuperscript{13} examined how excessive internet use among university students can negatively affect daily life and contribute to lifestyle-related issues such as alcohol use. Furthermore, Stiglic et al.\textsuperscript{14} conducted a systematic review on the association between screen time (including internet usage) and dietary patterns in children and adolescents. The review found a link between higher screen time and increased obesity, unhealthier diet, lower quality of life, poorer well-being, and poorer cardiorespiratory fitness. These results show that young people's less-than-ideal diets may be related to their increased time spent online, particularly playing video games. Studying the impact of internet addiction on dietary habits in young university students is essential for identifying its links to health issues, academic performance, mental well-being, and lifestyle choices, thereby enabling targeted interventions and public health strategies.

In recent years, Oman has witnessed a significant increase in internet usage.\textsuperscript{15} While internet usage is prevalent worldwide, a concerning issue arises with addiction to the internet in young adults in particular. Masters\textsuperscript{16} found evidence of social networking addiction among Omani students and suggested a need for intervention. However, there have been no study investigating the prevalence of addiction to the internet among Omani students, nor have there been studies about the potential changes in dietary patterns associated with such addiction. Although numerous studies worldwide have explored the effect of internet addiction on dietary habits, this data cannot be generalized to Oman. It is crucial to consider the unique cultural, societal, and economic factors that distinguish Omani students, emphasizing the need for local research to provide tailored insights and inform effective interventions. Therefore, it is hypothesized that internet addiction is prevalent among Omani junior university students and that it influences their dietary habits.

**Methods**

A quantitative cross-sectional study was conducted at Sultan Qaboos University (SQU), targeting junior students of 18-19 years old. This age group was chosen because it is in a
critical transitional phase from adolescence to early adulthood, a period marked by significant personal and academic developments that may influence Internet use patterns.

Inclusion criteria included students who are within the age range of 18-19 years and enrolled in their foundation or first year at SQU. Exclusion criteria excluded students outside this age range. The sample size was calculated using Slovin’s formula. Based on the statistical report from SQU, the university enrolls approximately 3088 students into their foundation program each fall semester. The formula used to compute the sample size is \( n = \frac{N}{1 + N \cdot e^2} \). with \( N \) representing the population size, \( e \) the desired margin of error (0.05), the calculation \( n = \frac{3088}{1 + 3088 \cdot 0.05^2} \) results in a sample size of approximately 354 students. To accommodate a potential 5% attrition rate, the sample size was adjusted to 370 students. A nonprobability sampling technique with a convenience sampling approach was used, selecting junior college students who were available during the data collection period.

Three instruments were used in this study.

1. Socio-demographic questionnaire

The first tool consisted of socio-demographic measures, including variables such as gender, age, college, year of study, and grade point average (GPA).

2. The Chen Internet Addiction Scale

The second tool was the Chen Internet Addiction Scale (CIAS), a self-reported questionnaire of 26 items where respondents are asked to rate the degree to which each statement matches their Internet use experience over the last three months. It assesses the primary symptoms of Internet addiction, such as tolerance, compulsive use, and withdrawal. Additionally, it evaluates the negative effects of Internet addiction on social activities, interpersonal relationships, physical health, and time management. The questionnaire also explores the number of hours spent online each week and the user’s level of internet experience. The scale is a four-point Likert scale, with 1 representing 'strongly disagree', and 4 signifying 'strongly agree'. The total score a student could achieve extended from a minimum of 26 to a maximum of 104, with higher scores
indicating greater addiction to the internet. Chen et al.\textsuperscript{20} suggested a cut-off point of 63/64 as optimal for distinguishing cases of internet addiction from non-cases, achieving a high diagnostic accuracy of 87.6%. As a result, students with CIAS scores exceeding 64 were classified into the internet addiction diagnosis group. The CIAS demonstrated high reliability, with Chen et al.\textsuperscript{20} reporting Cronbach’s alpha of 0.94, and this study confirming a high internal reliability of 0.962.

3. The Change in Dietary Habit Questionnaire

The third instrument was the Change in Dietary Habit Questionnaire, adapted from the Dietary Behavior and Diet Quality Questionnaire developed by Kim et al.\textsuperscript{21} The dietary behavior questionnaire assessed recent changes in meal size, appetite, eating speed, frequency and reasons for skipping meals, and the frequency, type, and reasons for snacking. The first part of the questionnaire which assessed changes in dietary habits, including meal size, appetite, and eating speed while using the Internet was utilized. The original questionnaire's Cronbach's alpha was not reported by the authors. In this study, using only three questions from the questionnaire, the Cronbach's alpha was 0.387.

Data were collected over a span of four weeks in November during the Fall 2020 semester. After receiving ethical approval from the Research and Ethics Committee of the College of Nursing at SQU, the administrators in charge of the foundation program and first year studies at SQU were contacted and informed about the study and its objectives. With the assistance of the course coordinators, junior college students were approached. The research objectives and the voluntary nature of the study were explicitly communicated to the students, who then signed a consent form and completed the questionnaires. It was also assured to the students that their responses would remain confidential, with no names being reported or any identifying information being disclosed. Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS) software program, version 23. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were employed to describe demographics, prevalence of internet addiction, and changes in eating habits. To assess the relationship between internet addiction and eating habits among adolescents, Chi-
square cross-tabulation analyses were conducted. To assess the association between internet addiction and demographics, Chi-square cross-tabulation and logistic regression were employed.

**Results**

A total of 377 junior college students were recruited for this study, with 55.2% being female and 44.8% were male. The average age was 18.28 ± 0.45 years, with the majority being 18 years old (71.9%) and the remaining 28.1% being 19 years old. The study included students from various colleges at SQU, with the majority from the College of Engineering (17.2%), followed by the College of Nursing (15.4%), and the College of Science (13.0%). Most of the participants were from the foundation level (70.3%), followed by those in their first year of study (24.7%). Due to the fact that many participants were foundation level students who had not yet finished the mandatory or elective university courses required to generate a GPA, nearly half of participants (49.9%) had no GPA. The participants’ demographic characteristics are summarized in Table 1.

The diagnosis of internet addiction was made using the overall score from the CIAS, with participants deemed to be internet addicts if they had a CIAS score of 64 or higher. This threshold was used to estimate the prevalence rate of internet addiction among the study population, revealing that 59.9% of the junior college students at SQU were struggling with internet addiction. A total of 226 participants (59.9%) were identified as having internet addiction, compared to 151 participants (40.1%) who did not.

The majority of the junior college students studied who had internet addiction (62.8%) reported a change in their dietary habits, specifically a decrease in meal size. Furthermore, 54.4% of them experienced a worse appetite compared to those students who maintained control over their internet use. Regarding changes in eating speed, there was no significant relationship observed between internet use and eating speed among the students in either group ($X^2 = 5.687, p = 0.128$). Table 2 reveals a statistically significant difference in both meal size ($X^2 = 30.528, p < 0.001$) and appetite changes ($X^2 = 28.731$, $p$),
between different levels of internet addiction among the studied junior college students.

Chi-Square crosstabulation and logistic regression analyses were used to investigate whether there is a link between internet addiction and demographic variables, including gender, age, college affiliation, and GPA. However, these analyses did not reveal any statistically significant results, suggesting that there is no association between these demographic factors and internet addiction in this study.

**Discussion**

This study examined the prevalence of internet addiction among young junior students at SQU and its association with dietary habits. It is crucial to distinguish between internet addiction and necessary internet use for academic purposes. Thus, employing a validated and reliable scale is essential. The CIAS effectively identifies compulsive and detrimental internet behaviors. We recognize that many students heavily depend on the internet for academic research, communication, and coursework completion. However, this extensive but necessary use should not be misconstrued as addictive behavior. According to the CIAS score, a large percentage of junior college students (59.9%) were struggling with internet addiction. This high prevalence rate highlights the growing concern of internet addiction among young individuals, particularly in the digital age, where internet usage has become an essential component of daily life. The results are consistent with another study carried out in Oman among SQU students. Masters asked students to report their addiction levels and found that approximately 47.2% are addicted to social media, particularly YouTube. However, this study’s results do not align with those from Far Eastern studies (China and Taiwan) where the use of the CIAS showed that addiction prevalence ranged from 6.9% to 17.9%, which is relatively low. This discrepancy could be explained by the fact that the students included in the Far Eastern studies were above 20 years of age. Lozano-Blasco et al. showed that internet addiction is high among young adults and there is a significant incidence among new generations.
Surprisingly, more than half of students with internet addiction (62.8%) reported a decrease in meal size, indicating a possible link between excessive internet use and changes in dietary habits. This result is consistent with prior research suggesting that internet addiction may contribute to irregular eating patterns and meal skipping as a result of excessive screen time and gaming binge episodes. These poor eating habits might have a negative impact on students' nutritional intake as well as their general health.

Snacking may be associated with the high frequency of skipping dinner; more frequent snacking was reported in high-risk internet users than in low risk internet users. Furthermore, more than half of students with internet addiction (54.4%) reported having a worse appetite than those without addiction. This data suggests a possible link between internet addiction and reduced appetite, which could be related to the psychological stress and isolation from real-life experiences that are typically associated with internet addiction. The results of this study are in accordance with international studies showing that internet addiction among young university students is related to uncontrolled eating habits and skipping breakfasts. Similarly, Hassan et al. showed that internet addiction in adolescents leads to loss of appetite. In contrast, this study found no significant association between internet addiction and the speed of eating among both groups. This finding suggests that, within the context of this research, internet addiction may not directly influence the speed at which students eat. However, it is important to note that other unexamined factors could affect eating speed. It is also worth considering that dietary habits are significantly influenced by local dietary culture.

This study underscores the importance of counseling for junior students who struggle with internet addiction. Given the strong association between internet addiction and poor dietary habits, it is crucial to focus on comprehensive therapies that address both behavioral aspects. Addressing the underlying causes of excessive internet use is critical, and this should be complemented by raising awareness and implementing prevention strategies. Encouraging healthy eating habits and regular meals can also be effective in mitigating the negative effects of internet addiction on dietary patterns.
This study has several limitations. Conducting the research at a single university in Oman restricts the generalizability of the results. Furthermore, small sample size and restriction of the study population to junior students may also impact the findings. The self-reporting nature of the questionnaire may introduce response biases, such as recall bias, which relies on students’ memory of their Internet use and dietary habits and may lead to inaccuracies in the reported data. Additionally, the cross-sectional design of the study prevents the establishment of causality between internet addiction and dietary changes. Not all dietary habits identified in the literature were examined, which could inhibit a comprehensive understanding of the impact of internet addiction on dietary habits. Furthermore, because the dietary habits questionnaire did not follow a logical sequence in the four-point Likert scale, it was not possible to use regression analysis to better understand predictors of internet addiction. Finally, the CIAS does not clearly differentiate between internet use for academic purposes and non-academic activities, which could affect the interpretation of internet addiction levels among students.

Conclusion
This study showed a significant prevalence of internet addiction among Omani junior college students, which was associated with negative changes in their eating habits. Nearly 60% of the students were identified as internet addicts, exhibiting dietary changes like reduced meal size and appetite compared to non-addicted peers. These findings emphasize the need for targeted awareness and interventions to treat internet addiction and its consequences on dietary habits.

Conflict of Interest
The authors declare no conflict of interest.

Funding
No funding was received for this study.
Authors’ Contribution

MAJ contributed to the conceptualisation, methodology, investigation, data curation, data analysis, writing (original draft), supervision and project administration. JN contributed to the conceptualisation, methodology, investigation, data curation, data analysis and writing (original draft). HA-H contributed to the conceptualisation, methodology, data collection and writing (review and editing).

References


18. SQU. University Profile Statistics Overview. 2022.


Table 1: Baseline characteristics of the participants included in this study (N = 377)

<table>
<thead>
<tr>
<th>Demographics</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>169 (44.8%)</td>
</tr>
<tr>
<td>Female</td>
<td>208 (55.2%)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>271 (71.9%)</td>
</tr>
<tr>
<td>19</td>
<td>106 (28.1%)</td>
</tr>
<tr>
<td>College</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>65 (17.2%)</td>
</tr>
<tr>
<td>Nursing</td>
<td>58 (15.4%)</td>
</tr>
</tbody>
</table>
Science 49 (13.0%)  
Arts 46 (12.2%)  
Education 42 (11.1%)  
Commerce 37 (9.8%)  
Law 29 (7.7%)  
Agriculture 27 (7.2%)  
Medicine 24 (6.4%)  

**Year of study**  
Foundation 265 (70.3%)  
First Year 93 (24.7%)  
Second Year 19 (5.0%)  

**GPA**  
No GPA yet* 188 (49.9%)  
Less than 2.0 20 (5.3%)  
2.0 – 3.0 20 (5.3%)  
3.1 – 3.5 108 (28.6%)  
3.6 – 4.0 41 (10.9%)  

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### Table 2: Dietary habits changes among internet addiction and non-internet addiction participants

<table>
<thead>
<tr>
<th>Dietary habits</th>
<th>Internet Addiction N = 226</th>
<th>Non-Internet Addiction N = 151</th>
<th>Chi-square test</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Changes in meal size</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased</td>
<td>54 (23.9%)</td>
<td>36 (23.8%)</td>
<td>30.528</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Decreased</td>
<td>142 (62.8%)</td>
<td>60 (39.7%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No change</td>
<td>30 (13.3%)</td>
<td>55 (36.5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Changes in appetite</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Better</td>
<td>51 (22.6%)</td>
<td>27 (17.9%)</td>
<td>28.731</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Worse</td>
<td>123 (54.4%)</td>
<td>52 (34.4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No change</td>
<td>32 (14.2%)</td>
<td>55 (36.4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do not know</td>
<td>20 (8.8%)</td>
<td>17 (11.3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Changes in eating speed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fast</td>
<td>56 (24.8%)</td>
<td>39 (25.8%)</td>
<td>5.687</td>
<td>0.128</td>
</tr>
<tr>
<td>Slow</td>
<td>122 (54.0%)</td>
<td>70 (46.4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>34 (15.0%)</td>
<td>36 (23.8%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irregular</td>
<td>14 (6.2%)</td>
<td>6 (4.0%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*First semester students are classified as 'No GPA yet' because they have not yet received a GPA score.