

## Research Article

# Effect of Internet Addiction on Dietary Behavior and Lifestyle Characteristics among University Students

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### Abstract

With increased use of internet in daily lives, its negative effects are also being observed on physical, psychological and social health of individuals.

**Objective:** To determine the effect of internet addiction (IA) on dietary behavior and lifestyle characteristics among university students.

**Methods:** In this cross-sectional study, the subjects were students selected from four universities in Lahore, Pakistan through two-stage sampling (n = 322). Levels of Internet Addiction (IA) were assessed using Young Internet Addiction Test and demographics, dietary behavior and lifestyle factors using self-reported questionnaire.

**Results:** Severe and moderate IA was present in 9.6% and 41.9% of population respectively. High prevalence was found among males, Private Sector University and engineering students. Frequent breakfast skipping, increased meal size and habit of snacking while using internet was found associated with IA. Internet Addicts were also used to eat less than recommended daily servings of dairy and fruit and more servings of meat group than their no internet addict counterparts ( $p < 0.05$ ). Fast food and fried items were most consumed snacks, while carbonated beverages were most consumed beverages among internet addicts. IA was found associated with lesser physically activity, shorter duration of physical activity, disorganized sleep pattern and less duration of sleep ( $p < 0.05$ ).

**Conclusion:** Unhealthy dietary behavior and lifestyle habits were exhibited by internet addicts. University students should be educated regarding importance of balanced diet and healthy lifestyle for effectual primary prevention of numerous chronic diseases.

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### Introduction

The internet, since its advancement in 1990s, has become the most rapidly grown medium of today's modern life. But negative effects of internet use are the growing concern among health care

providers and educators. Since the mid- 1990s "Internet addiction" (IA) has been acknowledged as a new kind of psychiatric disorder and addiction showing indicators same as those of other conventional addictions<sup>1,2</sup> and a variety of terms are used to describe this behavior which include "problematic

internet use”,<sup>3</sup> “Internet addiction”<sup>2</sup> and “pathological Internet use”.<sup>4</sup>

Internet Addiction is commonly attributed by signs such as excessive and uncontrolled use, tolerance, emotional issues, and social impairment resulting in personal, domestic, educational, monetary, and job-related problems that are specific of other addictions.<sup>5</sup>

Prevalence of internet addiction varies extensively around the globe. Internet addiction has also become an alarming health issue in many Asian countries including China, Hong Kong, and Taiwan with prevalence rate of 2% to 18%.<sup>6</sup> While in a study conducted in six Asian countries, occurrence of IA among adolescents was 51% and 48% in Philippines and Japan respectively.<sup>7</sup>

Youth is a critical stage in human life due to numerous physiological, psychological and occupational changes that occur. These changes affect the nutritional demands and eating behavior. Healthy eating habits are fundamental to prevent diseases in adulthood.<sup>8</sup> According to literature, uncontrolled use of internet is correlated to changes in the dietary behavior, sleep pattern, physical activities and overall daily routine of students.<sup>9, 10</sup> In Egypt, high school Problematic Internet Users had faster eating speed, sleep disturbances and more intakes of fast foods as compare to normal users.<sup>11</sup>

This study aimed to explore levels of internet addiction (IA) among students of different universities of Lahore, Pakistan who spend hours and hours using internet for assignments or projects preparation, communication purposes and as leisure time activity. Furthermore, this study investigated the effects of IA on their dietary behavior and lifestyle characteristics, which eventually influence the health of young population.

## Methods

In this cross-sectional study, the target population included students of undergraduate and postgraduate programs attending universities in Lahore, Pakistan. Two stage sampling procedure was followed. At first stage four universities were selected randomly from all universities located within Lahore District, two from public and private sector each. At second stage, students were selected using non-probability convenience

sampling procedure from different departments. Data was collected using self-administered, pre-tested questionnaire from October to December, 2016. Sample size was calculated using formula<sup>12</sup> by setting alpha level of  $\leq 0.05$ , probability level as 95% and the incidence of the disorder was taken as 30%.<sup>13</sup> The Estimated sample size was 322. The criterion for students for participation in the study was having access to internet either at university, home or on their mobile phones.

The self-reported questionnaire included demographic information, internet addiction test, dietary behavior and lifestyle information.

Demographic information included subject's gender, age at the time of study, type of living, type of university (private vs. public), major of study, parents' qualification and mother's occupation were obtained.

The levels of Internet addiction were measured using Internet Addiction Test.<sup>14</sup> Participants having score 39 or less were classified as “usual internet users” (not having any problem related to internet usage), from 40 to 69 as “moderate internet addicts” (having average problems related to internet usage), and 70 and above as “severe internet addicts” (having persistent notable problems related to internet usage).

Dietary behavior assessment of subjects included frequency of meal skipping, reasons for meal skipping, changes in meal size in past 3 months, type and frequency of snacking, snacking while using internet and type and frequency of daily beverages intake.

Lifestyle characteristics assessment included type, duration and frequency of planned physical activity, sleep pattern, hours of sleep per night, habit of smoking, alertness in class, and energy level during day was collected.

For evaluation of face validity and understandability, the questionnaire was pilot-tested by 14 university students who were not the participants in this study.

Completely filled questionnaires without any omission of data were selected for analysis. Data analyses were performed using the Statistical Package for Social Sciences (version 21). Chi-square test was

applied to evaluate the relationship between variables.

## Results

Total 322 students participated in the study. Out of 322 students, 167 (51.9%) were male and 155 (48.1%) were females. The respondents were

between the ages of 18 to 28 years with the mean age of  $21.20 \pm 2.165$ . Most subjects belonged to public sector universities (57.5%) and were living with family (58.7%). 81.3% mothers were staying at home.

Among total subjects studied, 9.6% of the students met the criteria of having severe internet addiction,

**Table 1:** Dietary Behavior Based on Levels of Internet Addiction

	Severe Internet Addicts	Moderate Internet Addicts	Usual Internet Users	Total	P value
Breakfast					
Skips	13 (41.9)	36 (26.7)	30 (19.2)	79 (24.5)	.021
Eats	18 (58.1)	99 (73.3)	126 (80.8)	243 (75.5)	
Lunch					
Skips	5 (16.1)	16 (11.9)	15 (9.6)	36 (11.2)	.546
Eats	26 (83.9)	119 (88.1)	141 (90.4)	286 (88.8)	
Dinner					
Skips	5 (16.1)	14 (10.4)	15 (9.6)	34 (10.6)	.557
Eats	26 (83.9)	121 (89.6)	141 (90.4)	288 (89.4)	
Change in meal size					
Increased	14 (45.2)	35 (25.9)	32 (20.5)	81 (25.2)	.048
Decreased	6 (19.4)	29 (21.5)	30 (19.2)	65 (20.2)	
No change	11 (35.5)	72 (52.6)	94 (60.3)	176 (54.7)	
Snacking while using internet					
Yes	19 (61.3)	68 (50.4)	57 (36.5)	144 (44.7)	.042
No	11 (35.5)	64 (47.4)	92 (59.0)	167 (51.9)	
Occasionally	1 (3.2)	3 (2.2)	7 (4.5)	11 (3.4)	
Skips = skips a meal four or more days of a week					
Eats = skips a meal three or less days of a week					

**Table 2:** Snacking Pattern Based on Levels of Internet Addiction

	Severe Internet Addicts	Moderate Internet Addicts	Usual Internet Users	Total	P value
Fast foods					
Daily	5 (16.1)	11 (8.1)	10 (6.4)	26 (8.1)	.036
4-6 times/week	8 (19.4)	29 (21.5)	17 (10.9)	52 (16.1)	
≤ 3 times /week	32 (64.5)	95 (70.4)	129 (82.7)	244 (75.8)	
Fried Items					
Daily	2 (6.5)	4 (3.0)	3 (1.9)	9 (2.8)	.025
4-6 times/week	9 (29.0)	14 (10.4)	16 (10.3)	39 (12.1)	
≤ 3 times /week	20 (64.5)	117 (86.7)	137 (87.8)	274 (85.1)	
Biscuits /cookies					
Daily	4 (12.9)	20 (14.8)	15 (9.6)	39 (12.1)	.672
4-6 times/week	7 (22.6)	33 (24.4)	35 (22.4)	75 (23.3)	
≤ 3 times /week	20 (64.5)	82 (60.7)	106 (67.9)	208 (64.6)	
Confectionary					
Daily	1 (3.2)	14 (10.4)	10 (6.4)	25 (7.8)	.492
4-6 times/week	5 (16.1)	25 (18.5)	24 (15.4)	54 (16.8)	
≤ 3 times /week	25 (80.6)	96 (71.1)	122 (78.2)	243 (75.5)	
Packed chips /crisps					
Daily	6 (19.4)	18 (13.3)	16 (10.3)	40 (12.4)	.142
4-6 times/week	10 (32.3)	35 (25.9)	30 (19.2)	75 (23.3)	
≤ 3 times /week	15 (48.4)	82 (60.7)	110 (70.5)	207 (64.3)	



**Table 3:** Lifestyle Characteristics Based on Levels of Internet Addiction

	Severe Internet Addicts	Moderate Internet Addicts	Usual Internet Users	Total	P value
Physical activity					
Yes	8 (25.8)	55 (40.7)	77 (49.4)	214 (43.9)	.038
No	23 (74.2)	80 (59.3)	79 (50.6)	273 (56.1)	
Physical activity duration					
<30 minutes	28 (90.3)	114 (82.0)	113 (72.4)	255 (79.2)	.047
30-60 minutes	2 (6.5)	16 (11.9)	28 (17.9)	46 (14.3)	
>60 minutes	1 (3.2)	5 (3.7)	15 (9.6)	21 (6.5)	
Sleep pattern					
Always organized	6 (19.4)	42 (31.1)	70 (44.9)	118 (36.6)	.046
Often organized	11 (35.5)	49 (36.3)	50 (32.1)	110 (34.2)	
Always disorganized	8 (25.8)	21 (15.6)	17 (10.9)	46 (14.3)	
Often disorganized	6 (19.4)	23 (17.0)	19 (12.2)	48 (14.9)	
Sleep per night					
Less than 6 hours	15 (48.4)	43 (31.9)	46 (29.5)	104 (32.3)	.038
6-8 hours	12 (38.7)	79 (58.5)	103 (66.0)	194 (60.2)	
More than 8 hours	4 (12.9)	13 (9.6)	7 (4.5)	24 (7.5)	
Sleepiness in class					
Yes	19 (61.3)	71 (52.6)	64 (41.0)	154 (47.8)	.041
No	12 (38.7)	64 (47.4)	92 (59.0)	168 (52.2)	
Smoking					
Yes	5 (16.1)	18 (13.3)	20 (12.8)	43 (13.4)	.885
No	26 (83.9)	117 (86.7)	136 (87.2)	279 (86.6)	

41.9% were having moderate internet addiction while 48.4% were considered as normal users or had no internet addiction. More males were severely addicted to internet than females (10.8% vs. 8.4% respectively), while moderate internet addiction was present equally in both genders (42.5% males and 41.3% females). A statistically significant association between gender and internet addiction could not be established ( $p = .697$ ). Internet addiction was found more prevalent among students from private sector universities ( $p = 0.017$ ), and among studying engineering ( $p = 0.004$ ). No statistically significant association was found between internet addiction and type of living, parents' education and mother's occupation.

Dietary behavior based on levels of internet addiction is shown in Table 1. Severe internet addicts were found to skip breakfast ( $p = .021$ ), had increased meal size in last 6 months ( $p = .048$ ) and had habit of snacking while using internet ( $p = .042$ ). Snacking pattern based on levels of internet addiction are demonstrated in Table 2. Fast food and fried items were most consumed snacks among subjects ( $p = .016$  and  $.025$  respectively). A higher consumption of carbonated beverages, tea and coffee was also

observed among internet addicts.

Lifestyle characteristics based on levels of internet addiction are shown in Table 3. Severe internet addicts were mostly not found to be involved in a planned physical activity than normal users ( $p = .038$ ). They also had more disorganized sleep pattern as compare to normal internet users ( $p = .046$ ). Severe internet addicts also found to have shorter duration of sleep (less than 6 hours per day) than moderate internet addicts and usual internet users ( $p = .038$ ). Habit of smoking was not found to be associated with internet addiction.

## Discussion

This study was conducted among students of four universities of Lahore to evaluate the prevalence of internet addiction and its effect on their dietary behavior and lifestyle. Previously some prevalence studies have been conducted in Pakistan but none have explored the effects of internet addiction on dietary behavior and lifestyle of local population.

Studies conducted in different regions of the world show a wide range of internet addiction prevalence among different age groups with prevalence rate as

low as 0.8% in Italy 15 to 51% in Japan 7 and overall 6% prevalence globally.<sup>16</sup> In this study, 9.6% of the students met the criteria of being severe internet addicts and 41.9% as moderate internet addicts, which is similar to Turkish<sup>17</sup> and Korean studies.<sup>18</sup> However, prevalence studies are difficult to compare due to variations in availability and usage of internet in different areas, variations in age groups, differences in diagnostic tools utilized and differences in sampling methodology used.<sup>19</sup>

Male gender was found to be more addictive to internet than females (10.8% vs. 8.4%). These findings have been confirmed by the study conducted in eleven European countries, having IA in 5.2% males and 3.8% females.<sup>20</sup> Prevalence of internet addiction was found higher among engineering students (19.7%) as compared to other fields of specializations. This finding also coincides with the previous studies. In an Indian study, internet dependency was 13.5% in engineering students as compared to 5.8% in non-engineering students.<sup>21</sup> It may be due to greater availability of computers and internet and least parental control on its use, as it is considered as essential requirement of engineering curriculum by parents.

In this study internet addicts were found to spend more time in online activities. However many students declared it was difficult for them to exactly calculate the time spent on internet due to widespread availability of internet on smart phones and tablets.

In the current study dietary behavior and its relationship with internet addiction was studied. It was demonstrated that internet addicts had frequent breakfast skipping habit as compare to normal users ( $p < 0.05$ ). These findings confirm the results of previous study conducted among Egyptian high school students.<sup>11</sup> Habit of breakfast skipping could be related to late night use of internet, sleep disturbance and consequently getting up late for breakfast.

A higher percentage of students with IA reported habit of snacking while using internet as compare to normal users. Similar snacking behavior was observed in Korean adolescents with high IA than normal users.<sup>10</sup> Fast foods and fried foods were the most consumed snacks. These findings corroborated

the previous findings of excessive junk food intake in internet addicts.<sup>11,22</sup> A higher consumption of carbonated beverages, tea and coffee and lower consumption of milk and fresh fruit juices was also noted among internet addicts ( $p < 0.05$ ). Many students declared that they consumed tea and coffee to avoid sleepiness and remain alert in class.

In the current study moderate and severe internet addicts have been found to be less engaged in a planned physical activity, less frequently and for a shorter duration than normal users. Physical inactivity and sedentary lifestyle, major features in internet addicts lead to obesity and obesity is a risk factor to cause further internet addiction.<sup>23</sup> Internet addicts reported more disorganized sleep pattern, less duration of night sleep and tiredness and/or sleepiness in class as compare to normal users. These findings are consistent with previous studies. Study conducted by Canan et al.<sup>24</sup> mentioned similar behavior among internet addicts.

## Conclusion

It was concluded that Internet Addiction was found prevalent among university students. It has affected the dietary behavior and lifestyle characteristics of university students.

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