



Study of Internet Use Disorder and Emotional Eating in relation to Stress among Medical Students at Fayoum University

Dawoud M*

Department of Psychiatry, Fayoum University, Egypt

*Corresponding author: Dr Mariam Dawoud, Department of Psychiatry, Fayoum University, Egypt, Tel: 00201200611326; Email: med11@fayoum.edu.eg

Received Date: January 17, 2025; Published Date: January 31, 2025

Abstract

Background: Stress and different stressors are burden and problematic among medical students who need to adopt healthy ways of coping. The study aimed to detect relation between defective coping like internet use disorder and emotional eating with stress among medical students (from Medicine, Pharmacy, Dentistry and Nursing faculties. Anonymous 616 completed online forms with stress, internet use disorder, and emotional eating scales were assessed.

Results: Mild, moderate degree and severe degree of stress among participants were (70.4, 27.4, and 12.2 % respectively). The mean internet disorder scale was significantly higher among participants with moderate /severe stress ($p < 0.001$). There was significant association between mild stress and happy emotional eating ($p = 0.025$). Internet use disorder was highly significantly associated with the different studied stressors (problems with friends, problems with family, loneliness, stress by teaching system, stress by exams, and stress by financial issues (P value was < 0.001). However emotional eating was not significantly associated with any of these stressors except the item ever failed a year (P value was 0.006).

Conclusion: This study concluded that student at the faculties of medicine, pharmacy, dentistry, and nursing, showed higher degree of internet use and higher emotional eating behaviour. Also, internet use problems were significantly associated with different stressors.

Keywords: Stress; Coping; Internet Addiction; Emotional Eating

Abbreviations

ANNU: AnNajah National University; EE: Emotional Eating; IDS9-SF: Internet Disorder Scale-Short Form; N: Number; PSS-10: Perceived Stress Scale -10; SD: Standard Deviation.

Introduction

It is well known that stress has increased worldwide among various populations. Medical students' constitutes a highly

vulnerable group to stress with a global prevalence of stress among them (34 %, 95 % CI, 27 %–42 %) results of meta-analysis by Peng P, et al. [1]. Stress is threatened conditions which affect individual's wellbeing [2]. Different responses to stress may show healthy or defective emotion and problem focused coping strategy [3]. Folkman and colleagues 1986 defined healthy coping mechanisms as planful problem solving, workable behaviours towards goal achievement, acceptance, positive reappraisal, confrontive coping, self-controlling of negative emotions and thoughts, and seeking

social supports [4]. Also, Stanisławski K [5] proposed different possible coping styles like positive emotional coping, efficiency, problem solving, and preoccupation with the problem, negative emotional coping, helplessness, problem avoidance, and hedonic disengagement. Task-oriented coping, in which a person may continue to avoid a stressful situation (task-oriented avoidance) by distraction (watching TV) or seeking out other people (task-oriented diversion) [5], is an example of unhealthy coping strategy that may hinder effective coping and problem solving abilities by the individual [6]. Unhealthy coping strategies are defective in helping individuals in accomplishing workable and productive life as they will be engaged in a vicious circle of negative and unworkable behaviours affecting their mental health such as task distraction (e.g. internet use) or emotional distraction (e.g. emotional eating). Emotional eating is defined as the tendency to overeat as a coping mechanism for regulating and reducing negative emotions, such as depression, anxiety, and stress [7] to escape from aversive affective state [8]. Internet use disorder is characterized by persistent compulsive use of the internet that interferes with daily life [9]. Studies have demonstrated that maladaptive coping with life stressors is associated with internet use disorder [10].

It is hypothesized that stress and its different coping styles affected by perceived emotions, urges and desires with defect in emotion acknowledgment and acceptance, hence, poor control of the person on their actions with endless automatically controlled loops of distracting repetitive behaviours like emotion eating or internet use disorders [11].

The present study aimed to study defective coping styles such as internet use or emotional eating behaviour disorder in relation to stress in medical students (Medicine, Pharmacy, Dentistry and Nursing faculties). Finally, this study investigated whether there is an association between different perceived stressors and styles of coping.

Methods

This study is a cross-sectional study that was conducted between first of April to the end of May, 2023. Participants were recruited from undergraduate students of the faculties of Medicine, Pharmacy, Dentistry and Nursing.

This study was approved and conducted according to the guidelines of the Scientific Research Ethics Committee (R 430 in its session (104) 12/3/2023).

The number of all eligible students was 3559 subjects. A population survey calculated by Epi Info™ 7, suggested 347 subjects as a sample at 95% confidence level and 5% margin of error. The targeted sample size was doubled (694)

to compensate for the non-response rate. Seventy eight incomplete or invalid responses were excluded and the final 616 responses were subjected to the statistical analysis.

1. Inclusion and exclusion criteria: All medical students enrolled at faculties of Medicine, Pharmacy, Dentistry and Nursing, from grade 1 to 6 and house officers were legible to participate. Only those with history of psychiatric disorders were excluded and this was mentioned clearly in the introduction of the form.

After accepting the informed consent at the beginning of an online Google forms, students were requested to fill the Google form containing: three online questionnaires anonymously:

- **Perceived Stress Scale (PSS-10) (10) (English form):** this scale contains 10 self-reported questions scores from 0 to 4 according to the severity of response to each question. This scale was used to measure the degree of stress during the last month prior to the study time. The scores were interpreted as following: (0-13: considered low stress, 14-26 considered moderate stress, while 27-40 considered high perceived stress).
- **Internet Disorder Scale–Short Form (IDS9-SF) (23):** (English form) to detect problematic internet behaviour. This questionnaire consists of nine items with each scored between 1 and 5. A total score can be obtained by summing up all responses and it ranges between 9 to 45 points, with higher scores being indicative of a higher degree of Internet use problems.
- **Emotional Eating Questionnaire (11):** available from (Wildwood family clinic forms) <https://wp.wildwoodclinic.com> › 2014/08) (English form) accessed at February 2023, to describe eating problems related to different emotions. This questionnaire contains 18 items that were answered as 'yes' or 'no' to describe and categorize eating related to different emotions as depressed eating (questions: 1 to 3), anxiety/stress eating (questions 4 to 6), angry eating (questions 7 to 9), bored eating (questions 10 to 12), lonely eating (questions:13 to 15), and happy eating (questions: 16 to 18).

The online Google forms were also contained data about the participants' characteristics like, their age, gender, grades, and different suggested stressors (Ever failed a year, Problems with friends, Problems with family, Loneliness, stress related to teaching system, exams, and financial issues). All forms were collected electronically and were exported to the personal computer of the first author where data were interpreted and analyzed using SPSS statistical package version 26.

Statistical Analysis

Different variables were tested for normality using Shapiro-Wilks test. Student's t-test was used for comparison of quantitative variables between two groups of normally distributed data. ANOVA test was used for comparison of quantitative variables between more than two groups of normally distributed data with Tukey test as post hoc test while. Chi-square test (χ^2) was used to study association

between qualitative variables (with Z test to compare column proportions). Whenever any of the expected cells were less than five, Fischer's Exact test was used. Two-sided P- value of < 0.05 was considered statistically significant. All the analysis was done by **SPSS statistical package version 26 (SPSS Inc. Released 2019. IBM SPSS statistics for windows, version 26.0, Armonk, NY: IBM Corp).**

Results

Character	(n) (%)
Age (mean \pm SD)	20.88 \pm 2.10
(minimum - maximum)	(17.0-27.0)
Gender	
Male	201 (32.6)
Female	415 (67.4)
Total	616 (100%)
Grade	
1 st	170 (27.6)
2 nd	112 (18.2)
3 rd	65 (10.5)
4 th	152 (24.6)
5 th	26 (4.2)
6 th	56 (9.1)
House officer	35 (5.8)
Faculty	
Medicine	462 (75.0)
Pharmacy	32 (5.2)
Dentistry	37 (6.0)
Nursing	85 (13.8)
Ever failed a year	58 (9.4)
Problems with friends	224 (36.4)
Problems with family	207 (33.6)
Stressed from Loneliness	360 (58.4)
Stressed by teaching system (graded 1 to 3 according to severity of degree)	
1	67 (10.9)
2	226 (36.7)
3	323 (52.4)
Stressed by exams (graded 1 to 3 according to severity of degree)	
1	44 (7.1)
2	151 (24.5)
3	421 (68.2)
Stressed by financial issues (graded 1 to 3 according to severity of degree)	

1	203 (33.0)
2	234 (38.0)
3	179 (29.1)

Table 1: Participants' characteristics. Data was presented as mean \pm SD for quantitative variables, while qualitative variables were presented as frequency (percentage).

Table 1 showed that the number of the included participants were 616. There were no missing data, as only participants who responded to all questions were able to submit the questionnaire. This table showed participants' data and different stressors where majority of the participants showed high degree of problems with friends and family, suffering from loneliness and high degree of stress from teaching system and exams and showed high degree of stress from financial issues.

Item	(n) (%)
Categories	
Mild	373 (70.4)
Moderate	168 (27.4)
Severe	75 (12.2)

Table 2: Perceived Stress Scale-10 among participants.

Table 2 showed the degree of stress among the participants. The study showed that those with mild degree, moderate degree and severe degree of stress were (70.4, 27.4, and 12.2 % respectively).

Emotional eating questionnaire	Mean \pm SD
Depressed eating	3.98 \pm 0.96
Anxiety eating	3.80 \pm 1.00
Angry eating	3.50 \pm 0.84
Bored eating	4.74 \pm 1.16
Lonely eating	4.30 \pm 1.11
Happy eating	5.11 \pm 0.97
Internet Disorder Scale-Short Form (IDS9-SF)	Total score (mean\pmSD) 25.88 \pm 7.92

Table 3: Styles of defective coping (emotional eating and internet use disorder).

Table 3 showed that coping with stressful negative emotions by emotional eating was mainly related to bored emotion (Mean \pm SD: 4.74 \pm 1.16) followed by lonely and depressed emotion (Mean \pm SD: 4.30 \pm 1.11; Mean \pm SD: 3.98 \pm 0.96 respectively) while anxiety and angry eating were (Mean \pm SD: 3.80 \pm 1.00; Mean \pm SD: 3.50 \pm 0.84 respectively). While, Mean \pm SD of happy eating was, 5.11 \pm 0.97. Also, the total score of internet use disorder among the participants was (mean \pm SD, 25.88 \pm 7.92).

Variables	Stress		P value
	mild (n=373)	Moderate/severe (n=243)	
Internet disorder scale	23.92 \pm 7.78	28.88 \pm 7.16	<0.001
Depressed eating	3.96 \pm 0.94	4.00 \pm 0.99	0.738
Anxiety eating	3.79 \pm 0.98	3.81 \pm 1.03	0.908
Angry eating	3.51 \pm 0.84	3.48 \pm 0.84	0.566
Bored eating	4.74 \pm 1.16	4.73 \pm 1.17	0.877
Lonely eating	4.30 \pm 1.10	4.31 \pm 1.14	0.933
Happy eating	5.17 \pm 0.96	5.00 \pm 0.98	0.025

Table 4: Association between stress and different defective coping styles (internet and emotional eating).

Table 4 showed that the mean internet disorder scale was significantly higher among participants with moderate / severe stress ($p < 0.001$). There was significant association between mild stress and happy emotional eating ($p = 0.025$). Internet use disorder was highly significantly associated with different stressors (problems with friends, problems

with family, loneliness, stress by teaching system, stress by exams, and stress by financial issues (P value was < 0.001). However emotional eating was not significantly associated with any of these stressors except the item ever failed a year (P value was 0.006). This was illustrated in Table 5.

Stressor	Internet use disorder	Emotional eating
	Mean ± SD	Mean ± SD
Faculty		
Medicine	26.11 ± 7.80	24.75 ± 4.47
Pharmacy	28.00 ± 8.69	21.33 ± 0.57
Dentistry	25.67 ± 7.57	26.02 ± 3.62
Nursing	23.87 ± 8.15*	26.06 ± 3.52
P value	0.042	0.119
Ever failed a year		
No	25.71 ± 7.85	25.80 ± 3.81
Yes	27.44 ± 8.48	21.75 ± 3.37
P value	0.082	0.006
Problems with friend		
No	24.64 ± 7.72	25.01 ± 3.71
Yes	28.06 ± 7.81	26.41 ± 4.20
P value	<0.001	0.18
Problems with family		
No	23.06 ± 7.63	25.43 ± 3.92
Yes	27.89 ± 7.50	25.58 ± 3.96
P value	<0.001	0.871
Loneliness		
No	23.06 ± 7.63	25.10 ± 2.77
Yes	27.89 ± 7.50	25.80 ± 4.04
P value	<0.001	0.424
Stressed by teaching system		
1	20.68 ± 7.61	24.93 ± 3.17
2	25.43 ± 7.32	25.90 ± 3.69
3	27.28 ± 7.92	25.30 ± 4.34
P value	<0.001†	0.661
Stressed by exams		
1	20.52 ± 8.96	25.33 ± 3.60
2	24.55 ± 7.44	25.10 ± 3.43
3	26.92 ± 7.69	25.60 ± 4.11
P value	<0.001†	0.881
Stressed by financial issues		
1	23.43 ± 7.94	25.56 ± 4.31
2	25.96 ± 7.04	25.97 ± 4.00
3	28.56 ± 8.13	24.94 ± 3.52
P value	<0.001†	0.544

*Higher among medicine and pharmacy students than nursing students

†: the 3 groups were different from each other

Table 5 : Association between different characteristics and stressors with defective coping styles (internet use disorder and emotional eating).

Discussion

As regards stress and different stressors experienced by our participants, majority of them experienced mild stress levels to moderate stress levels (70.4%, 27.4% respectively) while severe stress was 12.2% only and showed high degree of problems with friends and family, suffering from loneliness and high degree of stress from teaching system, and exams and showed high degree of stress from financial issues. In agreement with the current results Jordan RK, et al. [12] found that both females and males Saudi first year medical students maintained low stress levels [12].

Despite the difference in timing as in Jordan's study variables was measured only in first year medical students, with the measurement repeated five times over a period of approximately seven months, whereas the current study examined students at different undergraduate levels from four different medical schools (medicine, pharmacy, nursing and dentistry faculties). Further, all outcome measures were collected in a stressful period near the end of the school year and beginning of exams, a period that may be associated with increased stress level. In accordance to Hill and colleagues 2018 who studied different qualitative and quantitative stressors in relation to different coping strategies among Florida medical students. They reported that heavy workload, difficulties with studying, poor time management, work-life and relationships conflicts, medical school peer relations, health concerns, and financial stressors were among the most evident stressors [13].

In a country such as Saudi Arabia that share some religious and cultural background with the population of the current study, Gazzaz ZJ, et al. [14] found that the main stressors among Saudi medical students were related to academic life and final exam grades [14]. Also, Chaabane S, et al. [15] reviewed studies that addressed common stressors among nursing students in North Africa and Middle East regions and found that the most prevalent stressors were related to lack of leisure time due to overload in academic training and exams. Authors also reported that the majority of nursing students dealt with their problem using a problem focused coping strategy; whether regulating the emotion using an emotion focused coping, or venting the emotions [15].

In contrary to our results Al-Shahrani MM, et al. [16] found that the highest percentage of students were perceiving moderate to severe stress among 422 Medical Students of King Khalid University Saudi Arabia [16], however Al-Shahrani MM, et al. [16] results were closely related to ours in stressors perceived which were due to academic-related stressors (97.1%), followed by teaching- and learning-related stressors (93.9%) and group activities-related stressors (88.3%) [16].

Unlike our results a study held by Madani HE, et al. [17] found that stress was moderate to high in 62.9% among 222 students enrolled at the Faculty of Medicine and Pharmacy in Morocco and stress was mainly correlated to levels of anxiety, depression and poor sleep quality [17].

The discrepancies in degree of stress perception among studies may be due to different sample size and population, timing of study and methods used. In our study, mean internet disorder scale was significantly higher among participants with moderate /severe stress ($p < 0.001$). Also, only happy emotional eating was significant association with mild stress ($p = 0.025$). Internet use disorder was highly significantly associated with different stressors (problems with friends, problems with family, loneliness, stress by teaching system, stress by exams, and stress by financial issues (P value was < 0.001). However emotional eating was not significantly associated with any of these stressors except the item ever failed a year (P value was 0.006). Also, increased internet use disorder was significantly highly associated with different perceived stressors in medical and pharmacy students more than in nursing students.

Similarly, Khazaie H, et al. [18] reported internet addiction among 25% of the students under investigation from different schools (medicine, dentistry, and pharmaceutical) [18].

This is agreed with a Palestinian study, Berte and colleagues 2021 reported negative relationships between excessive internet use and addictive patterns of use and perceived self-stress which constitute risk factors for depression and suicide and indicating defective coping strategy [19]. Further, Mahmid FA and Abojedi A [20] showed that Palestinian students recruited from AnNajah National University (ANNU) exhibited an internet addiction that was positively correlated with perceived stress and negatively correlated with self-regulation; indicating defective coping [20].

In agreement with our results an Egyptian study, Shehata WM and Abdeldaim D [21] found that the total score of emotional eating (EE) was positively correlated with the total scores of perceived stress among 580 participants including students, medical staff and employee of the Faculty of Medicine at Tanta University during the COVID -19 pandemic [21]. Another studies among different populations other than medical students found a strong relation between emotional eating and stress as, EE showed significant correlation with increased stress and poor sleep in Saudi healthy women during the COVID pandemic [22]. Also, similar relationships were established between COVID-19-related tension and worries and perceived psychological distress in Norway [23]. Weingarten and Elston 1991 found that there is a strong relation between tension and urge to eat in undergraduate students [24].

A systemic review by Burnatowska and colleagues 2022 concluded that stress during the COVID-19 pandemic is related to EE and poor emotional regulation which are closely related to stress, hopelessness, and suicidal risk [25]. Scientists identified that people use food to self-regulate and self-medicate their emotions in the face of stressful times - which is associated with tiredness, boredom, loneliness, anxiety, tension - as an emotional defense. This may lead to eating disorders and obesity. Also, it is worth noting that EE is not associated with a sense of improvement but rather it is associated with feelings of guilt, shame, and anger [26], which may create a vicious circle of hopelessness and stress. Despite the previous studies results were examining relation between EE and stress among medical students during an exceptional period of COVID pandemic which may add more stress other than our studied stressors, however it warrants the necessity to consider this coping in future researches among this vulnerable group [27-29].

As regards the study limitation, this study has the inherited limitations of the cross-sectional survey design such as short follow up period and its inability to explain cause-effects among studied variables. Further, self-reported questionnaire and online forms may not be conclusive and face to face interview constitutes a more convenient sampling method [30].

Conclusion

In Egyptian healthcare students at the faculties of medicine, pharmacy, dentistry, and nursing, higher degree of internet use and higher emotional eating behaviour were evident. Also, internet use problems were significantly associated with different stressors (problems with friends, problems with family, loneliness and stress by teaching system, stress by exams, and stress by financial issues).

As regards the practical implications of the study and recommendation, this study highlights increased risk of internet use and emotional eating problems as means of negative coping to stress among students in the medical field. These unhealthy coping strategies may reduce the quality of life in this vulnerable group. Consequently, this may adversely affect the community as students in medical fields are the future backbone of the health system. Future studies should investigate the efficacy of various intervention programs to improve healthy coping among this population.

Declarations

Ethics Approval and Consent to Participate

The Ethical Committie gave their stamp of approval to the study proposal (R 430 in its session (104) 12/3/2023). All

participants were required to sign the informed permission in order to complete the online form.

Consent for Publication

Not applicable. All authors approved the manuscript and its publication.

Availability of Data and Materials

Not applicable

Competing of Interest

No conflict of interest was disclosed by any of the inspectors.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Authors' contributions

MD1 prepared the main idea, prepared the online forms, analyzed and interpreted the data and was a major contributor in writing the manuscript. SS2 was the main statistician of the work. All authors read and approved the final manuscript.

Acknowledgment

The authors express their deep gratitude to all the participants.

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