Hindawi
Mental Illness
Volume 2023, Article ID 1787947, 9 pages
https://doi.org/10.1155/2023/1787947

Research Article

Depressive Symptom Level, Sleep Quality, and Internet Addiction among Medical Students in Home Quarantine during the COVID-19 Pandemic

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Received 18 December 2022; Revised 10 May 2023; Accepted 27 May 2023; Published 6 June 2023

Academic Editor: Lut Tamam

The COVID-19 pandemic has a major impact on the mental health of people around the world. Due to the possible impact of quarantine conditions on mental health, we decided to assess internet addiction, depressive symptom level (DSL), and sleep disorders among medical students during the quarantine of COVID-19. This cross-sectional study was performed among medical students during the COVID-19 quarantine in Iran. Participants were selected using the available sampling method. Sleep quality, internet addiction, and depression were assessed using an online survey of the Pittsburgh Sleep Quality Index (PSQI), Internet Addiction Test (IAT), and Patient Health Questionnaire-9 (PHQ-9), respectively. Also, sociodemographic data including age, gender, marital status, smoking status, living circumstances, and educational status were asked. Participants were asked to share the link in their class social media groups. SPSS (version 16) was used for statistical analysis. Students participated; 64.9% of whom were female ($n = 564$), and the mean age of participants was 21.3 years. 74.1% of students' educational status was not mainly clinical. 48.2%, 28.6%, and 27.1% had poor sleep quality, DSL, and internet addiction, respectively. Smoking (AOR: 3.49, 95% CI: 1.56-7.76), living with family (AOR: 1.75, 95% CI: 1.16-2.66), and using social media for more than 2 hours were defined as predictive factors for depression. 165 participants (19%) were diagnosed with both poor sleep quality and DSL. There was a positive correlation between PSQI and PHQ-9 (r: 0.51, P value <0.001). A positive correlation was observed between IAT and PHQ-9 (r: 0.56, P value <0.001). The rate of DSL, internet addiction, and poor sleep quality were increased and strong correlations between them were concluded. Variables of gender, GPA, and smoking status were the most important associated variables.

1. Introduction

In January 2020, the World Health Organization (WHO) declared the outbreak of the 2019 coronavirus disease (COVID-19) a public health emergency [1], which its prevalence was growing fast. In May 2020, there were over 330,000 confirmed virus deaths worldwide [2]. As a response to this global health crisis, strict public health measures have been implemented to prevent the spread of this virus, including avoidance of public contact and quarantines [3].

In the modern era, technology such as the Internet has become an essential part of everyday life, and it has affected people's lifestyles. People's dependence on the Internet has made it a major behavioral health problem [4, 5]. Reportedly, most Internet users are between the ages of 18 and 24, and Internet addiction among Iranian medical students has been reported at 10.8% [6]. Internet addiction reduces sleep quality and causes psychological problems such as depressive symptom. Depression is a common mental disorder among students that affects around 5.6% of young people [7, 8].

Depression has numerous adverse effects on students' lives, including poor quality of life, poor academic performance, early school leaving, and increased suicide rates [7]. In addition, depression can trigger sleep disorders. Sleep disorders are conditions with irregular sleep, accompanied by decreased quality and hours of sleep, leading to excessive daytime sleepiness, disturbances in daily activities, and symptoms of insomnia. The rate of sleep disorders among students is 21.5%. Cell phone use before bed and internet addiction are two of the main causes of sleep disorders. These people are found to experience problems such as fatigue, stress, headaches, and anxiety [9, 10]. Studies suggest that the interaction between internet addiction, depression symptom level (DSL), and sleep disorders is somewhat complex and can be related to each other. Assessing these factors and the relationship between them increases our awareness and effectiveness of interventions regarding DSL and sleep disorders among students [11]. Yafei et al. studied this relationship in two ways: in the first hypothetical path, DSL was considered a mediator between internet addiction and sleep disorders in 70.6% of cases. These findings showed a significant effect of DSL on the relationship between internet addiction and sleep disorders. In the second path, internet addiction was considered a mediator between DSL and sleep disorders, and the results showed an effect of 4.1% [12].

Healthcare professionals have reported higher rates of anxiety, fear, depression, and obsessive-compulsive symptoms during the pandemic [13–15]. The clerkship (clinical part) is where clinical training for medical students begins. The clinical team includes clerks, who are regarded as members [16]. This new role might put them under psychological pressure, which heightens them in times of crisis. Medical interns, who are final-year medical students, are on the front lines when visiting patients. On the other hand, the Healthcare systems around the world were not prepared to deal with this crisis, which can lead to high level of stress and results in depression and anxiety [17].

To our knowledge, this is the first study that planned with the purpose of assessing the prevalence of some psychological factors among medical students and to investigating the sociodemographic correlates of these psychological issues.

2. Materials and Methods

2.1. Study Design and Participants. A cross-sectional study was performed on medical students from two universities (Shahid Sadoughi University of Medical Sciences and Esfahan University of Medical Sciences) across the country during the COVID-19 pandemic and the beginning of virtual education in scientific centers. The study was approved by the ethics committee of the Shahid Sadoughi University of Medical Sciences (Code: IR.SSU.REC.1399.154). Ethical principles related to the confidentiality of participants' information were also considered, and the participation was free and voluntary. Also, participants' informed consent was obtained. All medical students in Iran, aged 18 and more, were eligible, regardless of preexisting medical or mental health conditions (based on their statement); although cases with using antidepressant or anxiolytic drugs were not excluded. Enrollment for the dataset began on April 8, 2020, and ended on May 21, 2020, which 1250 individuals filled out at least the demographic part of the questionnaires. The online questionnaires were designed and distributed individually among students across the country. Participants were also asked to share the link in their class groups after completing the questionnaire to expand the study participants.

2.2. Sampling Method. Owing to the nonrandom sampling and regarding convenience method, sample size was determined by using the Cochran formula. Taking into account the probability of first-type (alpha) error at the 0.05 level (95% confidence), the acceptable level of test power equal to 0.95, the effect size of 0.1, and the prevalence of independent variables [18–20], the sample size was estimated to be at least 443. Therefore, the sample size ($N = 856$) was good for the main purpose of this study.

2.3. Questionnaires. Sociodemographic data including age, gender, marital status, smoking status, living circumstances, fasting (a religious custom in which eating, drinking, having a sexual relationship, or smoking are refused from dawn to sunset) [21], grade point average (GPA), social media screen time, and educational status were asked.

Pittsburgh Sleep Quality Index (PSQI), Internet Addiction Test (IAT), and Patient Health Questionnaire-9 (PHQ-9) were used.

The Pittsburgh Sleep Quality Index (PSQI) was used to measure sleep quality. This questionnaire was developed to assess the quality of sleep during the last month which includes 18 items measuring seven scales: subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbance, use of sleep medications, and daily time dysfunction. Each of the seven scales of this questionnaire has 0 to 3 Likert scores: no 0, week 1, moderate 2, severe 3, and the questionnaire's total score is calculated from 0 to 21, so that the higher score indicates the poorer quality of sleep. A total score greater than 5 indicates poor sleep quality in a person with severe problems in at least two areas and moderate problems in at least three areas. This questionnaire was translated to Persian by Hosseinabadi et al., and its validity and reliability were calculated ($\alpha = 0.74$ and correlation coefficient 0.88) [22].

The Internet Addiction Test (IAT) is aimed to assessing internet addiction and has 20 items ranked on a five-option Likert method from 1 to 5. The overall score was categorized from 20 to 100: severe (score 80 to 100), moderate (score 50-79), and mild internet addiction (score 30-49). The Persian version of this questionnaire was reviewed by Salehi et al. ($A = 0.917$) [23].

The Patient Health Questionnaire-9 (PHQ-9) evaluates the severity of DSL in individuals based on the Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV). The questionnaire consists of 9 questions with a Likert score of 0 to 3, and the overall score is measured from 0 to 27, so a greater score indicates a more severe disorder. The score greater than 20 indicates severe; scores of 15-19 indicate moderate, 10-14 indicate mild DSL, and 5-9 indicate mild signs of depressive symptoms. The Persian

Table 1: Association of internet addiction, sleep quality, and depressive symptom scores with variables.

Variables	Number (%)	Internet addiction		*P* value	Sleep quality		*P* value	Depressive symptom level		*P* value
		No	Yes		Poor	Good		No	Yes	
Gender										
Male	304 (35.1)	225 (74.1)	79 (25.9)	0.51	173 (56.9)	131 (43.1)	0.03	225 (74)	79 (26)	0.24
Female	564 (64.9)	406 (71.9)	158 (28.1)		275 (48.7)	289 (51.3)		392 (69.5)	172 (31.5)	
Age										
≤21	548 (63.2)	403 (73.5)	145 (26.5)	0.53	282 (51.4)	266 (48.6)	0.86	394 (71.8)	154 (28.2)	0.72
>21	320 (36.8)	227 (70.9)	93 (29.1)		166 (51.8)	154 (48.2)		225 (70.3)	95 (29.7)	
Marital status										
Not married	814 (93.7)	593 (72.8)	221 (27.2)	0.91	425 (52.2)	389 (47.8)	0.18	578 (71)	236 (29)	0.73
Married	54 (6.3)	39 (72.2)	15 (27.8)		22 (40.7)	32 (59.3)		39 (72.2)	15 (27.8)	
Smoking status										
No	806 (92.8)	590 (73.2)	216 (26.8)	0.35	427 (52.9)	379 (47.1)	≤0.01	588 (72.9)	218 (27.1)	≤0.01
Yes	62 (7.2)	42 (67.7)	20 (32.3)		21 (33.8)	41 (66.2)		29 (46.7)	33 (53.3)	
Fasting										
No	267 (30.7)	189 (70.7)	78 (29.3)		111 (41.5)	156 (58.5)		171 (64)	96 (36)	
Regularly	482 (55.5)	359 (74.4)	123 (25.6)	0.50	266 (55.1)	216 (44.9)	≤0.01	354 (73.4)	128 (26.6)	0.04
Not regularly	119 (13.8)	84 (70.5)	35 (29.5)		70 (58.8)	49 (41.2)		91 (76.4)	28 (23.6)	
Living circumstances										
Alone	423 (48.7)	304 (71.8)	119 (28.2)	0.56	208 (49.1)	215 (50.9)	0.23	315 (74.4)	108 (25.6)	0.08
With family	445 (51.3)	327 (73.4)	118 (26.6)		239 (53.7)	206 (46.3)		303 (68)	142 (32)	
Education status										
Not clinical	644 (74.1)	459 (71.2)	185 (28.8)	0.07	341 (52.9)	303 (47.1)	0.27	463 (71.8)	181 (28.2)	0.73
Clinical	224 (25.9)	174 (77.6)	50 (22.4)		108 (48.2)	116 (51.8)		157 (70)	67 (30)	
GPA										
16 and lower than 16	348 (40.1)	228 (65.5)	120 (34.5)	≤0.01	164 (47.1)	184 (52.9)	0.07	217 (62.3)	131 (37.7)	≤0.01
More than 16	520 (59.9)	403 (77.5)	117 (22.5)		283 (54.4)	237 (45.6)		394 (75.7)	126 (24.3)	
Social media use										
Less than 2 h	218 (25.1)	201 (92.2)	17 (7.8)		126 (57.7)	92 (42.3)		186 (85.3)	32 (14.7)	
2 h. to 4 h.	288 (33.1)	241 (83.6)	47 (16.4)	≤0.01	157 (54.5)	131 (45.5)	0.01	204 (70.8)	84 (29.2)	≤0.01
More than 4 h.	362 (41.8)	188 (51.9)	174 (48.1)		164 (45.3)	198 (54.7)		219 (60.4)	143 (39.6)	

Chi-square test was used; GPA: grade point average (range: 0-20).

version of this questionnaire was evaluated by Ardestani et al., and its validity and reliability were calculated ($\alpha = 0.91$) [24].

2.4. Statistical Methods. The Statistical Package for the Social Sciences Software (SPSS, version 16.0) was used to perform all statistical analyses. Categorical variables were expressed using frequency, and quantitative data were expressed as mean ± standard deviation. The prevalence of dependent factors was examined and then stratified by sociodemographic data. A univariate binary logistic regression analysis was performed, then variables found to be significant were included in subsequent binary multiple logistic regression analyses. Also, a Pearson correlation analysis between dependent variables was performed. The associations were presented using odd ratios (OR) and their 95% confidence interval (95% CI). The *P* value for statistical significance was set at 0.05.

3. Results

From the initial enrollment, 856 students answered all of the questions. 64.9% of them were male ($n = 564$), and the mean age of participants was 21.2 years (SD: 2.2, range: 18-41) that 223 (25.7%) participants were 20 years old. 93.7% did not smoke ($n = 814$), and 92.8% were not married ($n = 806$). Nearly half of the students fasted regularly during the month (55.5%). 74.1% of students' education status was not mainly clinical ($n = 644$). Other baseline characteristic data is presented in Table 1. The sleep quality mean score was 5.93 (SD: 3.35) which indicated that 419

Table 2: Descriptive analysis of sleep quality (PSQI) components.

PSQI components (range: 0–3)	Mean ± SD	Score (*N*, %)	
		<2	≥2
Subjective sleep quality	1.25 ± 0.80	589 (67.8%)	272 (31.3%)
Sleep latency	1.19 ± 0.90	559 (64.3%)	288 (33.1%)
Sleep duration	0.56 ± 0.92	688 (79.2%)	141 (16.2%)
Sleep efficiency	0.64 ± 1.05	622 (71.6%)	148 (17.0%)
Sleep disturbance	0.85 ± 0.46	772 (88.8%)	36 (4.1%)
Use of sleep medications	0.21 ± 0.67	798 (91.8%)	60 (6.9%)
Day time dysfunction	1.33 ± 0.91	456 (52.5%)	403 (46.4%)

PSQI: Pittsburg sleep quality score; SD: standard deviation; *N*: number.

(48.2%) of the participants had poor sleep quality (i.e., scoring >5 out of 21 on the PSQI). The highest score was obtained from the dimension of daytime dysfunction (1.33 out of 3), and the lowest was on the use of sleep medications (0.21 out of 3) (Table 2). As a result of binary logistic regression and chi-square tests, the proportion of students with poor sleep quality was significantly higher in females, smokers, those who did not fast, and those who used social media for more than 4 hours a day (Tables 1 and 2).

For DSL, the mean score was 7.7 (SD: 5.7), and 249 students (28.6%) suffered from DSL (i.e., scoring ≥9 out of 27 on the PHQ-9). Our findings showed that smoking, not fasting, a GPA lower than 16, and using social media for over 4 hours are significantly associated with a higher risk of DSL (P value <0.05). The mean score of internet addiction was 42.33 (SD: 14.87) which indicated that 236 (27.1%) of students had internet addiction (i.e., scoring ≥50 out of 100 on the IAT). Logistic regression and chi-square tests revealed that GPA ≥16 is associated with a lower risk of internet addiction (OR: 0.54; CI: 0.40–0.74; P value <0.05) (Table 1).

In the multivariate logistic regression, participants with a GPA ≥16 were less likely to have internet addiction (OR: 0.54, 95% CI: 0.40-0.74). Similarly, female participants with a GPA ≥16 were associated with lower risk of DSL than males and those with GPA <16 (AOR: 0.58, 95% CI: 0.36-0.93; AOR: 0.58, 95% CI: 0.39-0.86, respectively), while living with family (AOR: 1.78, 95% CI: 1.20-2.64) and using social media more than 2 hours were defined as predictive factors for DSL. Female participants were less likely to have poor sleep quality (AOR: 0.63, 95% CI: 0.45-0.88). Fasting (not regularly and regularly) was significantly associated with higher risk of poor sleep quality, and it became stronger after adjustment (AOR: 0.66, 95% CI: 0.46-0.94; AOR: 0.53, 95% CI: 0.32-0.88, respectively). Smoking (AOR: 2.30, 95% CI: 1.20–4.41) was found to increase the risk of poor sleep quality (Table 3).

165 participants (19%) were diagnosed with both poor sleep quality and DSL. Therefore, there was a positive correlation between PSQI and PHQ-9 (r: 0.51, P value <0.001). Also, 109 participants (12.5%) were suffering from internet addiction and DSL, and a positive correlation was observed between IAT and PHQ-9 (r: 0.56, P value <0.001) (Figures 1 and 2).

4. Discussion

Prolonged self-isolation from society and educational environments leads to negative psychological effects. Healthcare students are considered a vulnerable category among the population [25]. The rate of DSL increased to 33%, while 25% were diagnosed with DSL, almost half of medical students had poor sleep quality, and the internet addiction rate was 25%. Male gender seems to be a predisposing factor to poor sleep quality, and DSL and three modalities measured in this study gained no relationship to age. There were no significant relationship found between grade point average and sleep quality or DSL. Fasting was found to be a protective factor for poor sleep quality, and the participants who lived away from family before the quarantine had 1.75 times more chance of developing DSL. Finally, DSL showed a direct relationship with internet addiction and poor sleep quality.

The current study revealed that the rate of DSL increased to 33%, while 25% were diagnosed with DSL. Accordingly, it was reported that more than half of the people in Asia suffered from DSL during the quarantine period [26]. Similarly, Mahdavinoor et al. revealed that this rate was almost equal to 33% in Iran during the quarantine period [27].

The internet addiction rate was also 25% which is higher than Asian countries average [28] and also higher than the reported rate in previous studies conducted in Iran before the pandemic [29–31]. Tahir et al. studied internet addiction among medical students in Egypt, Guyana, India, Mexico, Pakistan, and Sudan during the quarantine period. Considering the same cutoff point for the IAT questionnaire, they reported that 40% of the participants had internet addiction [32], which was higher than the prevalence reported in the present study.

Almost half of the medical students had poor sleep quality, which varied between 15% and 78% in different cities in Iran before the outbreak of COVID-19 [33]. In the present study and similar studies conducted in Egypt and Nepal during the pandemic, it was shown that almost half of the medical students had poor sleep quality [34, 35]. Unlike other

Table 3: Univariate and multivariate regression analysis of internet addiction, sleep quality, and depressive symptom level with other parameters.

Variables	Internet addiction		Poor sleep quality		Depressive symptom level	
	OR (95% CI)	AOR (95% CI)	OR (95% CI)	AOR (95% CI)	OR (95% CI)	AOR (95% CI)
Gender						
Male	1.00	1.00	1.00	1.00	1.00	1.00
Female	0.90 (0.65-1.23)	0.76 (0.54-1.06)	0.71 (0.51-0.98)*	0.63 (0.45-0.88)*	0.79 (054-1.16)	0.58 (0.36-0.93)*
Age						
≤21	1.00	1.00	1.00	1.00	1.00	1.00
>21	1.10 (0.80-1.50)	1.04 (0.76-1.44)	0.97 (0.71-1.32)	0.93 (0.68-1.28)	1.06 (0.73-1.54)	0.98 (0.66-1.46)
GPA						
Lower than 16	1.00	—	1.00	1.00	1.00	1.00
16 and more	0.54 (0.40-0.74)*	—	1.32 (0.97-1.80)	0.76 (0.55-1.05)	0.53 (0.37-0.77)*	0.58 (0.39-0.86)*
Marital status						
Not married	1.00	1.00	1.00	1.00	1.00	1.00
Married	0.96 (0.51-1.82)	0.95 (0.50-1.80)	1.52 (081-2.85)	1.47 (0.77-2.81)	0.87 (0.41-1.83)	1.03 (0.47-2.25)
Smoking status						
No	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.30 (0.73-2.30)	0.93 (0.46-1.88)	2.19 (1.19-4.01)*	2.30 (1.20-4.41)*	2.98 (1.56-5.71)*	1.97 (0.98-3.98)
Fasting						
NO	1.00	1.00	1.00	1.00	1.00	1.00
Not regularly	0.83 (0.59-1.17)	0.88 (0.63-1.25)	0.58 (0.41-0.81)*	0.66 (0.46-0.94)*	0.64 (0.43-0.96)*	0.85 (0.55-1.30)
Regularly	1.01 (0.62-1.64)	1.03 (0.63-1.69)	0.49 (0.30-0.80)*	0.53 (0.32-0.88)*	0.53 (0.29-0.97)*	0.58 (0.30-1.09)
Living circumstances						
Alone	1.00	1.00	1.00	1.00	1.00	1.00
With family	0.91 (0.67-1.23)	0.97 (0.71-1.32)	0.83 (0.61-1.12)	0.86 (0.63-1.17)	1.38 (0.96-1.98)	1.78 (1.20-2.64)*
Social media use (hour)						
Less than 2	—	—	1.00	1.00	1.00	1.00
2-4	—	—	1.14 (0.77-1.69)	1.07 (0.72-1.60)	2.40 (1.42-4.03)*	2.35 (1.38-4.00)*
More than 4	—	—	1.65 (1.13-2.41)*	1.42 (0.96-2.10)	3.81 (2.30-6.32)*	3.31 (1.97-5.57)*
Education status						
Not-clinical	1.00	1.00	1.00	1.00	1.00	1.00
Clinical	0.71 (0.49-1.03)	0.70 (0.48-1.26)	1.20 (0.86-1.70)	1.24 (0.87-1.76)	1.07 (0.71-1.61)	1.18 (0.73-1.71)

*P value was lower than 0.05; univariate and multivariate regression analysis; GPA: grade point average (range: 0-20); OR: odds ratio; AOR: adjusted odd ratio.

performed studies, male gender seems to be a predisposing factor to poor sleep quality and DSL, due to the role of men in society which is considered to be more in Iranian culture [26, 36–39]. However, Eleftheriou et al. showed that poor sleep quality was more common in female nurses, which could be due to a different tool for sleep quality assessment [34]. In line with this study, previous studies reported no association between gender and internet addiction [32, 40, 41].

Three modalities measured in this study gained no relationship to age. Wu et al. founded inverse proportion between age and sleep quality among medical students, as well as poorer sleep quality in the sixth-year medical students, as revealed by Eleftheriou et al. [34, 42]. Therefore, educational level and subtype are considered to have a confounding effect.

Although this study did not find a significant relationship between grade point average and sleep quality, or DSL, which seems to be a result of the two-category division system for grade point average, Nakhostin-Ansari et al. acknowledged that a higher grade point average was associated with a lower chance of DSL and anxiety disorders [43]. The causal relationship between grade point average and DSL is not exactly clear, but previous studies have confirmed the relationship between these two factors [44, 45]. Although the current study did not find a significant relationship between a higher grade point average and sleep quality, some did [46, 47].

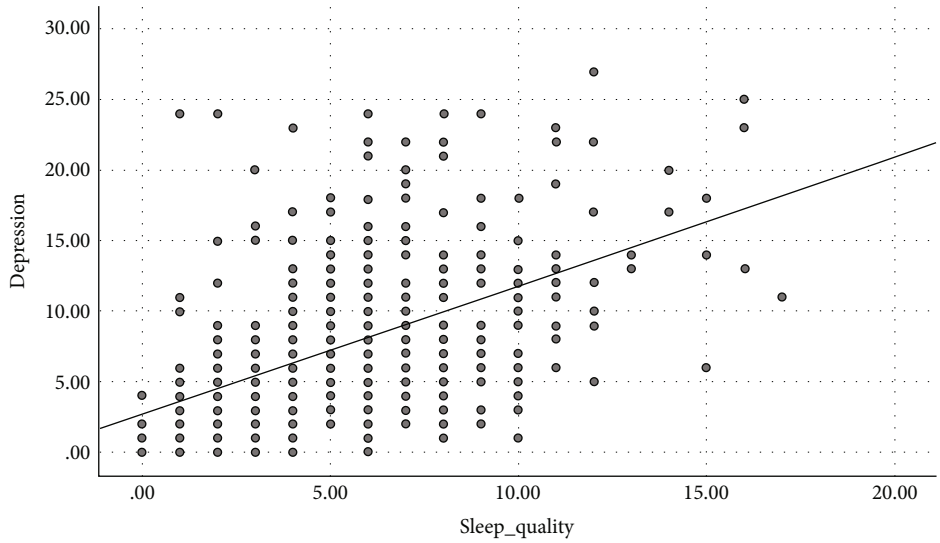

Figure 1: Correlation between the depressive symptom level and sleep quality (r: 0.51, P value <0.001).

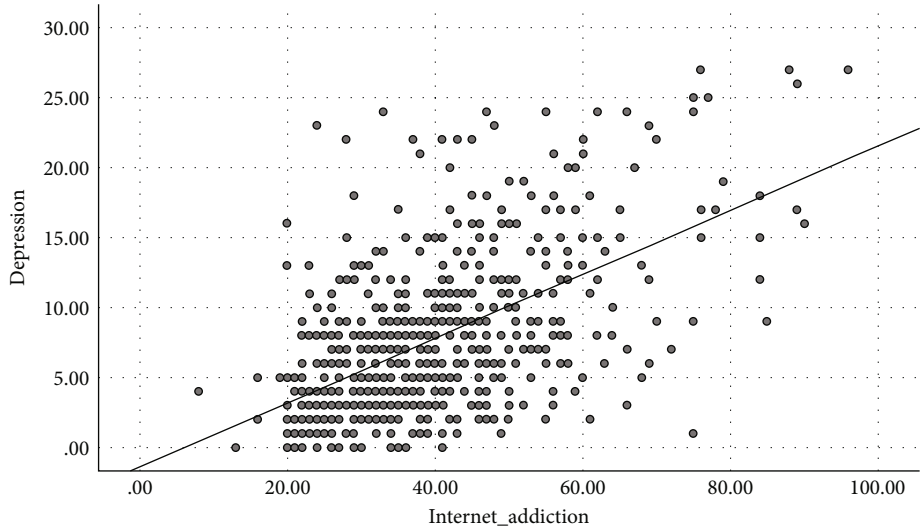

Figure 2: Correlation between the depressive symptom level and internet addiction (r: 0.56, P value <0.001).

Alcohol consumption and smoking are considered to be predisposing factors for DSL [48]. In recent years, the rate of smoking has increased among young adults, especially medical students, which had been reported to be 15% to 24% in Iran [49]. In this study, the odd ratio gained for smoking and DSL was 3.5 times; however, Celik et al. reported a 12.2 times ratio [50]. One of the limitations of this study was the lack of knowledge about the alcohol consumption status of the participants. A significant relationship between smoking and poor sleep quality was detected. In contrast, Karimi et al. did not reveal a significant relationship between smoking and sleep quality. This difference can be due to the difference in the categorization of sleep quality in two studies [28].

Recently, studies demonstrated that fasting improves sleep quality by reinforcing circadian rhythms and restricting food intake in the evening and at night. Weight loss affects fasting, which is effective in improving the quality of sleep [51]. Similarly, fasting was found to be a protective factor for poor sleep quality in the present study. The participants who lived away from family before the quarantine had 1.75 times the chance of developing DSL. On the contrary, Halperin et al. showed there is no significant relationship between these variables [38].

In line with previous studies, we observed that DSL has a direct relationship with internet addiction and poor sleep quality [52–55]. Celik et al. stated that poor sleep quality increased the chance of DSL by 3.2 times [50].

Serotonin and melatonin secretion, each responsible for happiness and sleep quality, respectively, are decreased by a disturbed sleep cycle which is regularly seen in employees of hospitals and medical centers [18, 56].

This study was conducted between the third and fifth months after the outbreak of the COVID-19 quarantine, the first peak of COVID-19 in Iran, when the disease was

unknown and the greatest fear and negative consequences were expected.

There are several limitations. Due to the cross-sectional type of study, the casualty could not be established. On the other hand, the questionnaires were all self-report which infolds biases. But, the results of this study indicated that these participants were prone to these disorders. Our findings also confirmed the association between internet addiction, which is increasing these days, and mental.

Further research is recommended in order to investigate the psychological impact of the COVID-19 pandemic at another peak. Also, other psychological factors such as anxiety, hopelessness, and socialization should be considered. More research is needed to determine the prevalence of psychological disorders through more reliable diagnostic maintenance. Further research should be focused on controlling and managing these mental health issues among university students.

5. Conclusion

The mental health of medical students should be a priority for academic policymakers and society, especially during the pandemic to deal with any further disaster. The study revealed that mental disorders, internet addiction, and sleep disorders increased, with the stimulation of the COVID-19 pandemic. Also, a strong correlation between DSL, internet addiction, and poor sleep quality was concluded, and variables of gender, GPA, and smoking status were the most important associated variables.

Data Availability

The dataset that supports the findings of the current study is available on request from the corresponding author.

Conflicts of Interest

The authors declared no potential conflict of interest.

Authors' Contributions

MHSH had the initial idea for the study. DCH and MA worked together on the design of the study. FB, FGHA, SS, ZN, and MHSH collected the data. DCH and MA did the statistical analyses. The final report and article were written by DCH, FB, FGHA, SS, ZN, and MHSH. Final editing and rewriting were performed by DCH. All authors read and approved the final manuscript.

Acknowledgments

We would like to thank the participants who responded the questionnaires.

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