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Evaluation of Sleep Quality before and During COVID-19 Quarantine and Its Relationship with Family Social Support: A Web-based Survey among University Students

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Abstract

Background: The pandemic of COVID-19 quarantined most of the world's population, which severely impacted daily life, especially academic activities.
Objectives: This study aimed to evaluate the sleep quality before and during COVID-19 quarantine and its relationship with family social support among university students.
Methods: This cross-sectional study was performed on 283 university students in Mashhad in 2020. A web-based questionnaire, including demographic information, Pittsburgh sleep quality index (PSQI) and Procidano Perceived Social Support from Family (PSS-Fa) questionnaires were sent to all students.
Results: The prevalence of PSQI > 5 among students before the quarantine was 80.6% and reached 82.7% during the quarantine. The mean score of PSQI before the quarantine was 10.00 ± 4.30 and reached 12.30 ± 5.53 during the quarantine (P-value < 0.001). PSQI score before and during quarantine showed a significant inverse correlation with the PSS-Fa score. The sleep quality in those who did not leave quarantine at all was significantly higher than in those who did.
Conclusions: This study shows decreased sleep quality in the students during the quarantine. In addition, students with more family social support had higher sleep quality, which could indicate the high impact of family social support on the students' quality of life.

Keywords: COVID-19, Quarantine, Sleep Quality, Social Support

1. Background

On 30th January 2020, the World Health Organization (WHO) explicitly stated the coronavirus disease 2019 (COVID-19) as a Public Health Emergency of International Concern (PHEIC) (1). By May of 2022, there were about 522 million officially reported infections and over six million deaths due to COVID-19 worldwide (2). One of the first and most important policies for governments to confront the spread of this disease in the absence of treatment or vaccine was social distancing and restrictions commonly known as lockdowns and quarantines (3). The quarantine restricts most social activities and imposes lifestyle changes on individuals. These lifestyle changes, along with economic challenges, the stress of infection, social isolation and loneliness, are major causes of mental health crises during this pandemic (4, 5). Among the mental and behavioral disorders imposed by this pandemic are changes in sleep habits. Sudden changes in working hours, telework, virtual classes, closure of universities, and the loss of communication with friends, expose students to these disorders more than others (6).

Social support refers to the perception of care and assistance from other people (7), which positively influences mental health and sleep quality (7-9). This correlation might be more prominent during quarantine as the quarantine increases the interactions of the family members. Since the relationship between healthy sleep and improvement of the immune system function is well-established, special attention should be given to proper sleep during this pandemic (10).

2. Objectives

Here, we aimed to study the sleep quality before and during COVID-19 quarantine and its relationship with fam-

ily social support among university students.

3. Methods

In this cross-sectional study, students who were studying in Mashhad, Iran, were selected using convenience sampling method during March and April of 2020. The protocol of this study was approved by the Ethics Committee of Mashhad University of Medical Sciences (Registration code; IR.MUMS.REC.1399.067). For sample size calculation, according to Huang and Zhao, who reported the sleep quality during the COVID-19 pandemic to be 18% (11) and considering an alpha error of 0.05, 194 participants were estimated for the minimum sample size. Considering a 20% dropout rate, the final sample size was 243. Initially, an electronic questionnaire, including demographic information and preliminary questions, Pittsburgh sleep quality index (PSQI) (12), and Procidano and Heller Perceived Social Support from Family (PSS-Fa) (13), was designed and sent to academic E-mails of 500 students at the Mashhad University of Medical Sciences and social media for other universities in Mashhad. Students were asked to complete PSS-Fa once and PSQI twice, i.e., pre-quarantine status and according to their current status. Preliminary questions included participants' opinions about how likely they were to get COVID-19 if they continued their current lifestyle, whether they had left home in the past 15 days, and if so, what was the reason for leaving home, and whether they had any chronic illness.

The Pittsburgh Questionnaire is a 19-item questionnaire that evaluates sleep quality based on sleeping habits. It has been translated into Persian and its validity has been confirmed (14). The total score is between 0 - 21, and a score higher than 5 indicates low sleep quality. Perceived Social Support from Family was developed by Procidano and Heller in 1983 (13). It has 20 questions and the options are yes, no and I do not know. The score ranges from zero to 20 and a higher score indicates higher social support. Persian version of this questionnaire was validated with an alpha Cronbach of 0.87 (15). The inclusion criterion was students studying in Mashhad universities, and exclusion criterion was a history of COVID-19 (3 people) as COVID-19 can solely cause sleeping disorders (16). We analyzed data with SPSS software version 16. Frequency and percentage alongside mean and standard deviation (SD) were used to describe the qualitative and quantitative variables, respectively. Paired *t*-test and Pearson correlation test were used for inferential analysis. All tests were two-tailed and $P < 0.05$ was considered statistically significant.

4. Results and Discussion

Eventually, 283 individuals were included. The mean age was 24.11 $\pm$ 2.54 and 72.4% were female. Seventy-five percent of the participants were studying medical sciences. Migraine was the most prevalent chronic disease of the participants (5.3%) (Table 1). The participants spent 12.59 $\pm$ 3.52 days entirely at home and 26.9% did not leave the house at all in the past 15 days. Shopping was the leading reason for leaving the house (43.5%). Overall, 84.5% of the participants considered their risk of developing COVID-19 less than 50%.

Table 1. Demographic Characteristics of the Participants

Gender	Frequency (%)
Man	78 (27.6)
Woman	205 (72.4)
Field of Study	
Medicine	134 (47.4)
Dentistry	11 (3.9)
Pharmacology	6 (2.1)
Nursing	27 (9.5)
Midwifery	14 (4.9)
Paramedicine	21 (7.4)
Basic sciences	14 (4.9)
Other	55 (19.4)
Marital status	
Single	246 (86.9)
Married	37 (13.1)
Living with parents	
Yes	244 (86.2)
No	39 (13.8)
Medical conditions	
Asthma	9 (3.1)
Cardiovascular disease	2 (0.7)
Epilepsy	1 (0.3)
High blood pressure	3 (1.0)
Migraine	15 (5.3)
No specific disease	253 (89.3)

The mean score of PSS-Fa was 14.07 $\pm$ 4.57. The low sleep quality (PSQI score < 5) was 80.6% before the quarantine, which reached 82.7% during the quarantine. The total score of PSQI and all domains except the sleep adequacy showed a significant increase (P-value < 0.001) (Table 2). Both PSQI scores before and during quarantine showed a significant inverse correlation with the PSS-Fa score (both:

P-value = 0.02 and r = -0.13); but the change in PSQI score did not correlate with the score of PSS-Fa (P-value = 0.42).

Table 2. Comparison of the Domains of PSQI Questionnaire Before and During Quarantine [a]

Components of PSQI	Before Quarantine	During Quarantine	P-Value
Sleep quality	0.86 ± 0.57	1.32 ± 0.88	< 0.001 [b]
Sleep delay	1.16 ± 0.91	1.68 ± 1.03	< 0.001 [b]
Sleep duration	5.12 ± 3.56	5.84 ± 4.38	< 0.001 [b]
Sleep adequacy	0.34 ± 0.81	0.46 ± 0.88	0.066
Sleep disturbance	0.89 ± 0.35	1.01 ± 0.45	< 0.001 [b]
Use of sleeping pills	0.17 ± 0.53	0.24 ± 0.67	< 0.001 [b]
Daily dysfunction	1.46 ± 0.90	1.76 ± 1.02	< 0.001 [b]
Total score	10.00 ± 4.30	12.30 ± 5.53	< 0.001 [b]

[a] Data reported as mean ± SD.
[b] Significant

Several reports have shown the negative social consequences of quarantine. Chu et al. reviewed adverse social outcomes of mass quarantine during COVID-19 like psychological distress, heightened communication inequalities, food insecurity, economic challenges, reduced access to health care, alternative delivery of education, and gender-based violence (5). Lima et al. reported that the chance of exacerbation of sleep disorders was higher in low-income people and those who lost their job. Interestingly, the chance of worsening sleep disorders was three times higher in the population aged 18 to 29, compared to the older adults (17). Torkian et al. showed that the Iranian population had poor sleep quality, which decreased with COVID-19 (18).

There are also studies with conflicting results, the most outstanding is the study of AMHSI Research Team on 14,000 subjects, which showed that the average time of sleep during quarantine increased by one hour and 34 minutes (19). This could be due to the disruptions from the daily routine, saving more time and flexibility for sleep adaption. Furthermore, telework may save commuting time, which can translate to more sleep. However, these findings may not be generalizable to populations with elevated symptoms of anxiety, depression, and loneliness; and Iran was not one of the studied countries. Among the reasons for sleep disturbances during the pandemic are media overuse (20), sudden radical changes in daily life, which changes in sleeping habits, increased sedentary lifestyles, decreased exposure to sunlight, boredom, stress and anxieties (21). Xiao et al. showed that the sleep quality of the medical staff was low and social support reduced anxiety and stress, improved self-efficacy, provided emotional support, and shared empathy (7).

This study had some limitations. First, the study sample size was small and did not allow assessing the impact of major and socioeconomic status on sleep quality. Second, the sample has been selected from the city of Mashhad and generalizing to all university students should be performed cautiously. Third, students responded to the quality of pre-quarantine sleep retrospectively, which may be prone to a self-report error.

5. Conclusions

We showed the negative impact of quarantine on sleep quality and the important role of social support from family on sleep quality. Policymakers should be aware of the possible consequences when quarantine is implemented and make predictions to manage them. The role of counseling families as an intervention for the improvement of sleep quality is an interesting topic for further investigation.

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Footnotes

Authors' Contribution: Study design: MKR and MRK; Data gathering: MRK; Data analysis: MKR; Manuscript drafting: MRK; Critical revising: MKR; Final approval: MKR and MRK.

Conflict of Interests: The authors declare no conflict of interest.

Data Reproducibility: The data presented in this study were uploaded during submission as a supplementary file.

Ethical Approval: This study was approved by the Ethics Committee of Mashhad University of Medical Sciences with ethics code: IR.MUMS.REC.1399.067 (webpage of ethical approval code is: ethics.research.ac.ir/PortalProposalList.php?code=IR.MUMS.REC.1399.067&title=&name=&stat=&isAll=&GlobalBackPage=https%3A%2F%2Fwww.google.com%2F).

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