



Association of Sleep Duration and Quality With Health-Related Quality of Life in Fresher University Students

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Background and Objective Sleep duration and quality are important factors for health-related quality of life (HRQoL). This study aimed at investigating the association of sleep duration and quality with HRQoL in fresher students of Neyshabur University of Medical Sciences.

Methods The study included 471 fresher students. The sleep duration and sleep quality were measured with the Persian version of Pittsburgh Sleep Quality Index (PSQI) and the HRQoL was evaluated with the Persian version of the 12-Item Short Form Survey (SF-12). The data were collected from late September to early October in 2019 and 2020. The multiple linear regression model was used to determine the independent association of sleep duration and quality with HRQoL. A p-value ≤ 0.05 was considered statistically significant.

Results The mean age of the participants was 21.8 ± 6.0 years and the majority of them (62.4%) were female. The total HRQoL score and the prevalence of poor sleep quality were 81.6% and 28.0%, respectively. Among the students, 51.8% and 6.4% reported a sleep duration shorter than 7 hours and equal or more than 9 hours, respectively. The multiple linear regression model showed that excessive sleep duration (≥ 9 h) and sleep quality were associated with Mental Component Summary (MCS) and total HRQoL, respectively ($p = 0.036$, $p = 0.018$).

Conclusions Referring to the results, enough and quality sleep has beneficial effects on HRQoL in students. Therefore, future strategies should be developed to improve sleep and consequently HRQoL among university students.

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Keywords Sleep duration; Sleep quality; Health-related quality of life; Students.

INTRODUCTION

Sleep is defined as a process that contributes to the recovery and restoration of physical and mental health. It provides the body with an opportunity to regulate hormone-oriented metabolism and cellular growth [1]. Some functional health elements such as cognitive performance, psychological and emotional condition, physical growth, and well-being are heavily influenced by sleep conditions. Notably, sleep duration and quality can also determine behavioral and health-related characteristics in individuals [2].

Advanced technology and industrialization have led to a reduced sleep duration among different age groups. In addition, age, sex, geographic location, improved socioeconomic leading to increased 24-home entertainment with social networks and television, and long

working hours can further accelerate the decreased sleeping duration [3,4]. However, the question of how much a person needs to sleep is still a challenge. Sleep duration varies across individuals and has been defined as the number of sleeping hours per 24-hour period that a person needs to function optimally. Short sleep duration is defined as an average sleep duration that lasts less than six or seven hours during each 24-hour period. On the other hand, long sleeping has been defined as sleeping equal or longer than 9 hours [5]. Both short and long sleep durations can lead to several health outcomes including obesity, hypertension, diabetes, and cardiovascular diseases [6,7].

Notably, sleep quality has been mentioned as the second aspect of sleep which affects metabolism and general health. Previous studies have shown that poor sleep quality is associated with some important factors such as alcohol consumption, and insufficient physical activities [8,9]. Due to the negative outcomes of abnormal sleep habits, the individuals' quality and quantity of sleep are more likely to be associated with their health-related quality of life (HRQoL).

Notably, the prevalence of insufficient sleep and impaired sleep quality has been increasing in young adults resulting in various consequences including interference with daily life activities, learning and mood, poor academic achievement and point grade average, and healthcare burdens [10]. This highlights the need for more studies on the impact of sleep duration and quality on students' HRQoL. Therefore, this study aimed to investigate the association of duration and quality of sleep with HRQoL in fresher students of Neyshabur University of medical sciences.

METHODS

Study Design and Population

This was a cross-sectional study. The baseline data were selected from a cohort study of the students who were enrolled in 2019 and 2020. The cohort study was established at Neyshabur University of Medical Sciences to collect data related to the students' lifestyles and their association with indicators of health conditions and academic achievements. The data were collected from late September to early October (enrollment period) for each year. At the end of each academic year, the data were compiled (annual follow-up).

After obtaining informed consent, all the fresher students were asked to complete several questionnaires on demographic, socioeconomic, general health, and lifestyle data accompanied by academic scores.

Ethics Approval and Consent to Participate

This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of the Neyshabur University of Medical Sciences (Date: 05.10.2019 /No: IR.NUMS.REC.1398.018). The partici-

pants agreed to participate in the study by confirming informed consent after being enlightened about the study objectives.

Sleep Duration & Quality Assessment

Students' sleep duration and quality were assessed using the Pittsburgh Sleep Quality Index (PSQI). The PSQI is a nineteen-item self-rated questionnaire that assesses sleep quality over the past one-month period. The PSQI score has a range of 0 to 21 in which the greater score indicates the worst sleep quality. A PSQI total score of greater than 5 indicated poor sleep quality and a score between 0-5 represented good sleep quality among students [11]. The students were asked to report the average amount of night sleep over a one-month period. Sleep duration was divided into three classes: insufficient (< 7 hours), sufficient (≥ 7 to < 9), and exceeded sleep duration (≥ 9 hours) using the PSQI scores. The Persian version of PSQI was developed by Alimirzaei et al. in student of Medical Sciences in Kerman province, Iran [12]. The reported sensitivity and specificity of the questionnaire were 100% and 93%, respectively.

Health-Related Quality of Life

A Twelve-item Short-Form Health Survey (SF-12) was developed to measure the HRQoL. SF-12 is derived from eight dimensions, physical functioning (PF), limitations related to role-playing due to physical problems (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), limitations due to role-emotional problems (RE), and mental health (MH) which were determined using 12 Likert scale questions. From these eight dimensions, Physical Component Summary (PCS) incorporates four scales to provide information for assessing PE, RP, BP, and GH. The Mental Component Summary (MCS) is measured for RE, VT, SF, and MH. All dimensions were measured on a 100-point scale in which the higher score presented better health status [13].

Covariates

The main demographic variables included age, sex (male/female), marital status (single/ married), family local residency (rural/urban), number of student' family member(s) ($\leq 4 / \geq 4$), smoking (yes/no), and alcohol consumption (yes/no). Using the measurements of height and weight, body mass index (BMI) was calculated for all the students enrolled in this study.

The wealth index (WI) was calculated using easy-to-collect data based on students' family ownership of some assets including telephone, mobile phone, fridge, microwave, personal computer, washing machine, bathroom, kitchen, toilet, car, motorcycle, house, number of rooms per capita and the house infrastructure. Also, regarding mental health status, Persian version of Beck's depression inventory (BDI-II) was utilized to reveal the level of depression in the students [14].

Statistical Analysis

Statistical analyses were performed using STATA software version 14 (Stata Co., College Station, TX, USA). Frequencies, percentages, means, and standard deviations were reported as descriptive analyses. To assess the association of sleep duration and quality with HRQoL, the univariate linear regression model was applied. Then, to evaluate the association of sleep duration and quality with HRQoL and its domains, components, and total HRQoL (adjusted for the confounder variables including sex, age, depression status, BMI, the number of students' family members, students' family WI, smoking, and marital status), multiple linear regression model was used. The significant level for the statistical test was considered at $p < 0.05$.

RESULTS

The demographic characteristics of the students recruited in the study are presented in Table 1. The mean age of the participants was 21.8 ± 6.0 years and the majority of them (62.4%) were female. More than three-quarters (78.6%) of the students did not show any symptoms of depression, although 4.2% of students had severe depression. According to the WI classification, 57.4% of the students reported an economic level of moderate to the richest, whereas the rest of them had poor or the poorest levels. More than half of the students mentioned that they slept for an average of less than 7 hours of sleep per 24-hour period, however, the students who reported a sleep duration of between 7 and 9 hours along with those who slept for 9 hours equal and more than 9 hours making up about 41.8% and 6.4%, respectively. As shown in Table 1, about a third of the students (28.0%) had poor sleep quality.

The total score of HRQoL was 81.6 ± 14.9 . The mean scores of HRQoL dimensions of the study population based on sex, age, marital status, BMI, family residency, the number of family member(s), smoking, depression, WI, sleep duration, and sleep quality are presented in Table 2. Among the students, those with no symptoms of depression had better scores regarding dimensions of HRQoL. Besides, the students who obtained poorer sleep quality scores had worse HRQoL scores. The results of the adjusted association of sleep duration and quality with HRQoL based on multiple linear regression models are presented in Table 3. According to this model, when it is adjusted for covariates, it was observed that short sleep duration (< 7 hours) was not associated with the dimensions, components, and total HRQoL scores ($p > 0.05$). However, there was a significant negative association between the dimension of VT ($B = -9.20$, $p = 0.022$), and MCS ($B = -5.69$, $p = 0.036$) with exceeded sleep duration (≥ 9 hours). There was borderline association between excessive sleep duration (≥ 9 h) and total HRQoL score ($B = -3.95$, $p = 0.078$). In addition, poor sleep quality was negatively related to MH ($B = -3.93$, $p = 0.031$), GH ($B = -4.39$, $p = 0.036$),

MCS ($B = -2.98$, $p = 0.049$), PCS ($B = -2.87$, $p = 0.032$), and total HRQoL score ($B = -2.92$, $p = 0.018$). There was borderline association between poor sleep quality and VT ($B = -4.21$, $p = 0.058$).

Table 1. Descriptive analysis of the variables

Variables	Number (%)
Sex	
Female	294 (62.4)
Male	177 (37.6)
Age (yr)	
< 20	276 (58.6)
≥ 20	195 (41.4)
Marital status	
Single	399 (84.7)
Married	72 (15.3)
BMI (kg/m^2)	
< 25	361 (76.6)
≥ 25	110 (23.4)
Family local residency	
Urban	370 (78.6)
Rural	101 (21.4)
Number of family member	
≤ 4	186 (39.5)
> 4	285 (60.5)
Smoking	
No	446 (94.7)
Yes	25 (5.3)
Depression	
No	370 (78.6)
Mild	48 (10.2)
Moderate	33 (7.0)
Severe	20 (4.2)
Wealth index	
Poorest	102 (21.7)
Poor	98 (20.8)
Moderate	84 (17.8)
Rich	93 (19.8)
Richest	93 (19.8)
Sleep quality	
Good	339 (72.0)
Poor	132 (28.0)
Sleep duration (hr)	
< 7	244 (51.8)
≥ 7 to < 9	197 (41.8)
≥ 9	30 (6.4)

BMI, body mass index.

Table 2. The mean scores of HRQoL dimensions according to the characteristics of the study population

	PF	RP	BP	GH	VT	SF	RE	MH	MCS	PCS	Total
Total	91.6	84.4	87.3	78.6	70.0	83.56	79.4	78.3	77.8	85.5	81.6
Sex											
Female	89.1	84.2	84.7	76.6	68.5	81.9	79.1	77.4	76.6	83.7	80.1
Male	95.6	84.6	91.5	82.0	72.5	86.4	80.8	79.7	79.8	88.4	84.2
p-value	< 0.001	0.837	< 0.001	0.010	0.083	0.053	0.285	0.265	0.063	< 0.001	0.004
Age (yr)											
< 20	92.0	83.5	87.4	79.4	69.7	83.3	77.9	78.4	77.4	85.6	81.5
≥ 20	90.9	85.5	87.1	77.6	70.4	84.0	81.3	78.1	78.5	85.3	81.9
p-value	0.509	0.279	0.850	0.371	0.775	0.782	0.108	0.900	0.523	0.796	0.786
Marital status											
Single	92.3	84.9	87.8	79.4	69.6	83.6	78.4	77.2	77.2	86.1	81.7
Married	87.5	81.2	84.4	74.4	72.22	83.3	84.7	84.2	81.1	81.9	81.5
p-value	0.040	0.135	0.189	0.075	0.392	0.921	0.029	0.012	0.099	0.021	0.931
BMI (kg/m ²)											
< 25	93.4	85.4	87.8	78.4	70.8	83.9	79.5	77.8	78.0	86.2	82.1
≥ 25	85.7	80.9	85.5	79.5	67.5	82.5	78.7	79.8	77.1	82.9	80.0
p-value	< 0.001	0.031	0.285	0.665	0.206	0.595	0.750	0.415	0.659	0.031	0.190
Family residency											
Urban	91.4	84.0	86.4	78.4	70.0	83.4	78.8	78.2	77.6	85.0	81.3
Rural	92.1	85.6	90.6	79.6	69.8	84.4	81.4	78.7	78.6	87.0	82.8
p-value	0.748	0.453	0.062	0.609	0.921	0.712	0.297	0.826	0.635	0.228	0.381
Family member(s)											
≤ 4	90.9	81.7	87.2	78.2	69.9	83.5	76.5	77.9	77.0	84.5	80.7
> 4	92.0	86.1	87.3	79.0	70.1	83.7	81.2	78.5	78.4	86.1	82.2
p-value	0.502	0.016	0.979	0.705	0.931	0.926	0.030	0.788	0.422	0.240	0.288
Smoking											
No	92.0	84.8	87.6	79.1	70.5	84.2	79.8	78.9	78.4	85.9	82.1
Yes	84.0	77.5	81.0	70.8	61.0	72.0	71.5	66.5	67.7	78.3	73.0
p-value	0.033	0.067	0.112	0.069	0.051	0.016	0.075	0.005	0.005	0.011	0.003
Depression											
No	93.2	87.2	90.8	83.9	76.2	89.4	84.5	85.0	83.8	88.8	86.3
Mild	87.5	76.3	77.6	64.7	53.1	70.8	65.4	62.8	63.0	76.5	69.8
Moderate	88.6	73.5	80.3	58.2	43.2	62.9	62.9	53.4	55.6	75.2	65.4
Severe	76.3	70.0	56.3	48.5	40.0	41.2	44.4	31.9	39.4	62.8	51.1
p-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Wealth index											
Poorest	90.7	82.0	86.0	81.3	72.5	84.6	78.9	79.5	78.9	85.0	81.9
Poor	90.0	85.8	87.8	79.1	70.2	83.7	80.9	77.4	78.0	85.7	81.9
Moderate	95.5	83.9	87.8	80.1	69.3	82.7	79.8	79.5	77.8	86.8	82.3
Rich	92.7	86.1	87.6	77.6	69.6	82.0	79.7	77.3	77.2	86.0	81.6
Richest	89.2	83.9	87.1	74.9	68.0	84.9	77.7	77.8	77.1	83.8	80.5
p-value	0.150	0.552	0.971	0.328	0.753	0.921	0.906	0.914	0.962	0.681	0.935

Table 2. The mean scores of HRQoL dimensions according to the characteristics of the study population (continued)

	PF	RP	BP	GH	VT	SF	RE	MH	MCS	PCS	Total
Sleep quality											
Good	93.0	85.9	89.2	81.5	73.2	86.1	81.8	81.7	80.7	87.4	84.1
Poor	87.9	80.5	82.2	71.4	61.7	77.1	73.1	69.5	70.4	80.5	75.4
p-value	0.006	0.006	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sleep duration (hr)											
< 7	90.4	86.3	84.1	74.9	67.4	82.1	76.2	74.8	75.1	82.9	79.0
≥ 7 to < 9	92.6	82.0	89.4	81.9	73.1	85.3	82.5	81.4	80.6	87.6	84.1
≥ 9	90.8	84.2	90.0	76.2	61.7	79.2	74.2	76.2	72.8	85.3	79.1
p-value	0.422	0.062	0.017	0.003	0.005	0.235	0.005	0.006	0.002	0.003	0.001

HRQoL, health-related quality of life; BMI, body mass index; PF, physical functioning; RP, limitations related to role-playing due to physical problems; BP, bodily pain; GH, general health; VT, vitality; SF, social functioning; RE, limitations due to role-emotional problems; MH, mental health; MCS, Mental Component Summary; PCS, Physical Component Summary.

DISCUSSION

This study aimed to investigate the association of sleep quantity and quality with HRQoL after adjusting for some important factors in fresher students of Neyshabur University of Medical Sciences. Considering the sleep duration and quality, the students were evaluated during the first semester of the academic year by administrating PSQI. The analysis of the data gave us a number of findings on the level of HRQoL among students. The findings indicated that the HRQoL score was 81.6% in students, which was similar to a large-scale study in China [15]. In addition, Al-Shibani and Al-Kattan [16] who assessed the well-being and QoL of dental students in Saudi Arabia reported an HRQoL score of 79.4%. It's interesting to note that most of the available literature indicates three descriptions (levels) of high, medium, and low for assessing HRQoL [17,18]. Medical sciences students have been frequently assessed for QoL; however, the findings were varied [19,20]. These variations between different studies can be attributed to the discrepancy in cultures and social contexts.

In this study, short sleepers (< 7 hours) made up 58% of the participants. This finding is congruent with that of a study conducted among students in Turkey where the prevalence of short sleep duration was reported as 69% [21]. Also, in a systematic literature review, the average sleep duration has been evaluated in students from 26 countries. Short sleep in Southeast Asian, Sub-Saharan African, and North African students was estimated at 45.0%, 43.1%, and 35.5%, respectively [22]. Likewise, the prevalence of short sleep duration (< 7 hours) in a meta-analysis including 57 studies was 43.9% [23]. These discrepancies in studies may be attributed to late-night activities, over-consuming foods that shorten sleep, and overusing electronic devices [24].

The overall prevalence of poor sleep quality in this study was 28.2%. These results were in line with a study conducted in Saudi Arabia where about 30% of medical sciences students reported poor sleep quality [25]. This is incompatible with the results of

a previous study that showed that the prevalence of poor sleep quality among students was 11% [26]. In addition, Zuki et al. [27] found that 57.3% of university students during COVID-19 outbreak suffered from poor sleep quality. A variety of lifestyles, habits, and needs may explain why the prevalence of poor sleep quality varies widely across the studies.

However, the results presented in Table 2 suggested an association of sex, marital status, BMI, and family residency with a few domains and subgroups of HRQoL. Interestingly, no association was reported between age and WI with all domains of HRQoL. Respecting the fact that as the global median age is increasing, individuals encounter increased health problems which means a decrease in HRQoL [28]. Contradicting our results, a household's cumulative living standard (household's WI) is strongly related to HRQoL, which implies that people with lower levels of WI are exposed to more health problems and subsequently worse QoL [29]. A similar association pattern was found between sex and HRQoL, indicating the HRQoL value was lower among females [30]. In contrast with our results, age played an important role in the association between sex and HRQoL [31]. As discussed in Moudi et al. [32] married men in their study had the highest level of QoL in comparison with those who were single. In the case of BMI, in some studies a strong association with HRQoL was found, showing increased BMI resulted in lower values of HRQoL among the participants [33]. The current results showed that among the variables, depression was significantly linked to all domains of HRQoL. Likewise, in a study conducted by Seo et al. [34], it was revealed that depression had a relationship with health behaviors in university students. Non-smokers had significantly better scores for most domains and summaries of HRQoL including PF, SF, MH, MCS, PCS, and total score of HRQoL. Milic et al. [35] examined the behavioral factors of QoL with a specific focus on the effect of smoking on first-to-third-year Serbian students. They highlighted that there was a significant difference in QoL scores of smoker students

Table 3. Adjusted association of sleep duration and quality with HRQoL (using multiple linear regression model)

HRQoL dimensions	Variables	Beta	SE	T	p-value
PF	Poor sleep quality	-2.52	1.87	-1.35	0.179
	Sleep duration (hr)				
	< 7	-0.53	1.72	-0.31	0.756
	≥ 9	-2.42	3.40	-0.71	0.476
RP	Poor sleep quality	-2.39	1.98	-1.21	0.229
	Sleep duration (hr)				
	< 7	-2.15	1.82	-1.18	0.238
	≥ 9	-1.86	3.59	-0.52	0.605
RE	Poor sleep quality	-2.17	2.16	-1.01	0.315
	Sleep duration (hr)				
	< 7	-3.08	1.98	-1.56	0.120
	≥ 9	-6.61	3.91	-1.69	0.090
VT	Poor sleep quality	-4.21	2.21	-1.90	0.058
	Sleep duration (hr)				
	< 7	-1.85	2.03	-0.91	0.362
	≥ 9	-9.20	4.01	-2.30	0.022
MH	Poor sleep quality	-3.93	1.81	-2.17	0.031
	Sleep duration (hr)				
	< 7	-1.75	1.67	-1.05	0.294
	≥ 9	-2.49	3.29	-0.75	0.451
SF	Poor sleep quality	-1.64	2.35	-0.68	0.496
	Sleep duration (hr)				
	< 7	1.36	2.15	0.63	0.529
	≥ 9	-4.67	4.26	-1.10	0.273
BP	Poor Sleep quality	-2.18	1.99	1.09	0.274
	Sleep duration				
	< 7	2.91	1.83	-1.59	0.112
	≥ 9	-0.51	3.61	0.14	0.888
GH	Poor sleep quality	-4.39	2.09	-2.10	0.036
	Sleep duration (hr)				
	< 7	-2.96	1.92	-1.54	0.124
	≥ 9	-4.86	3.80	-1.28	0.201
MCS	Poor sleep quality	-2.98	1.51	-1.98	0.049
	Sleep duration (hr)				
	< 7	-1.33	1.38	-0.96	0.336
	≥ 9	-5.69	2.73	-2.10	0.036
PCS	Poor sleep quality	-2.87	1.33	-2.15	0.032
	Sleep duration (hr)				
	< 7	-2.14	1.22	-1.74	0.082
	≥ 9	-2.16	2.42	-0.89	0.374

Table 3. Adjusted association of sleep duration and quality with HRQoL (using multiple linear regression model) (continued)

HRQoL dimensions	Variables	Beta	SE	T	p-value
Total HRQoL	Poor sleep quality	-2.92	1.23	-2.37	0.018
	Sleep duration				
	< 7	-1.73	1.13	-1.53	0.127
	≥ 9	-3.95	2.24	-1.77	0.078

HRQoL, health-related quality of life; SE, standard error; PF, physical functioning; RP, limitations related to role-playing due to physical problems; BP, bodily pain; GH, general health; VT, vitality; SF, social functioning; RE, limitations due to role-emotional problems; MH, mental health; MCS, Mental Component Summary; PCS, Physical Component Summary.

and those who had never smoked; there was an association between cigarette smoking with impaired QoL.

Based on the available literature, there is an association of sleep duration and quality with HRQoL, suggesting that enough sleep was associated with better HRQoL. The multiple linear regression model results indicated that those who slept for 9 hours or more were more likely to have a lower level of MCS scores. Excessive sleep duration is commonly related to sedentary behaviors which are remarkable risk factors for chronic health conditions such as hypertension, diabetes, and obesity, and this, therefore, may go along with a decrease in HRQoL [5]. In contrast with our findings, sleep duration of 9 hours or more was associated with better mental-oriented components of QoL in Chinese students [36]. As noted at the outset of this paper, individuals who had a sleep duration of less than 7 hours (inadequate sleep) were more likely to suffer from impairment of HRQoL. There are many debates about optimal sleep duration. In a study by Sung et al. [37], there was a U-shaped relationship between sleep duration and QoL. In this case, both short (≤ 5 h/d) and long (≥ 9 h/d) sleep durations were associated with lower scores of QoL.

This study extended the knowledge on the association between sleep quality and HRQoL, and the results indicated that poor sleepers reported fewer scores of some HRQoL dimensions. In previous studies, poor sleep quality has been shown to have a negative effect on HRQoL [38,39]. Notably, poor sleep quality is turning into a common problem among university students especially those who live in student dormitories [40].

Limitations and Strengths

The main limitation of the current study is related to the cross-sectional essence of the study in which the association among the variables is not strong enough and trustable. Since our study was designed to examine HRQoL in a group of first-year academic students, the sample was limited, and cannot be considered a perfect representative of the general college and university student population.

Our study has several strengths. Although we selected our data from only a group of fresher students, we had an adequate sample size. Further, a multiple linear regression model was used to assess the association of quantity and quality of sleep with HRQoL among university students.

Conclusions

In conclusion, the present study provided valuable insight on the association of sleep quantity and quality with the students' HRQoL. This study's results showed that more than half of the participants had good HRQoL and were short-sleepers; however, about one-third of the students reported having good sleep quality. Given the significant association between sleep problems and HRQoL, it can be concluded that the students with longer sleep have poorer HRQoL; although, poor sleep quality was significantly associated with HRQoL. Further follow-up studies could improve our knowledge on factors affecting HRQoL in the student population and suggest future strategies to improve sleep and HRQoL among college students.

Availability of Data and Material

The datasets generated or analyzed during the study are available from the corresponding author on reasonable request.

Author Contributions

Conceptualization: Ali Gholami, Ahmad Sharifnezhad. Data curation: Ahmad Sharifnezhad, Maryam Garmabi, Fatemeh Naderi, Fateme Darrudi, Zahra Andishmand. Methodology: Ali Gholami. Project administration: Ali Gholami, Ahmad Sharifnezhad. Writing—original draft: Ahmad Sharifnezhad, Maryam Garmabi, Fatemeh Naderi, Fateme Darrudi, Zahra Andishmand. Writing—review & editing: Ali Gholami.

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

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