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Case Study

Assessment of Covid-19 Anxiety and Its Relationship with Sleep Quality in Industrial Workers: a Case Study

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ABSTRACT

Background: Due to the prevalence of the Covid-19 virus and its effects on people's lives and the lack of studies on non-health workers, the present study was conducted to evaluate Covid-19 anxiety and its relationship with sleep quality among industrial workers. **Methods:** The research method was descriptive and cross-sectional. We selected 212 individuals using random sampling. Data were collected using a demographic information questionnaire, the Corona Disease Anxiety Scale (CDAS), and the Pittsburgh Sleep Quality Index (PSQI). For data analysis, Pearson correlation test, independent t-test, and ANOVA were used in SPSS software version 24. **Results:** The mean age of participants was 33.27±6.6, 78.8% of whom were male, and 79.3% were married. The CDAS and PSQI score's mean and standard deviation were 11.60±8.2 and 5.37±1.7, respectively. There was a significant relationship between CDAS scores and age (P= 0.008) and work experience (P= 0.005). Also, a significant relationship was observed between PSQI score and age (P= 0.032) and work experience (P= 0.009). There was a significant correlation between CDAS and PSQI scores (r= 0.341 and P= 0.007). People with lower levels of education showed high anxiety scores and poor sleep quality. **Conclusion:** According to the findings of this study, the authors concluded that by reducing anxiety, the quality of sleep could be increased. Therefore, to reduce anxiety and increase the quality of sleep and employee productivity, the researchers suggest that factory managers identify and eliminate the causes of anxiety by establishing continuous and regular mental health training.

Keywords: Anxiety; Covid-19; Sleep Quality; Workplace

Introduction

People are currently facing Covid-19 pandemic, a severe and unprecedented crisis, around the world.[1] This disease is similar to pneumonia that emerged in November 2019, Wuhan city, China.[2, 3] On February 19, 2020, the first case of Covid-19 was reported in Iran.[4] The virus has spread rapidly in different parts of the world due to its ability to transmit asymptomatically. Accordingly, it caused major consequences for public health and the quality of their life.[5, 6] In addition to

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physical injury, Covid-19 also seriously impacts people's mental health.[7] Implementing quarantine to control the disease has isolated people and reduced mobility , which can lead to increased anxiety.[8] Constant exposure to news of deaths and cases of Covid-19 on social media and the danger to the loved ones are other factors that can increase fear and anxiety. [8, 9] In a study conducted in the early stages of the Covid-19 outbreak in China, 54% of the participants rated the psychological impact as moderate or severe and about one-third reported their anxiety to be moderate to severe.[10]

The Covid-19 epidemic has not only changed the lifestyle of a large part of the population, but also affected the quality of their sleep.[11] A web-based, cross-sectional survey of 7236 participants during the Covid-19 outbreak in China estimated the prevalence of anxiety at 35.1% and suggested poor sleep quality.[7] Xiao et al. reported a correlation between anxiety and decreased sleep quality.[12] Poor sleep quality leads to impaired attention and memory, increased irritability, and emotional instability, causing anxiety, depression, and even suicide.[13] According to a study conducted in Italy, an increase in mental health problems during Covid-19 control measures impaired sleep quality and sleep habits in more than half of the country's population.[3] People wake up later during quarantine and fall asleep later due to their increased use of social media before going to bed.[14] Decreased sleep quality may also be due to anxiety and feelings of insecurity in this period.[15]

There is a two-way relationship between anxiety and sleep of individuals.[16] Good sleep quality affects well-being and mental health.[11] Research over the past decade has increasingly confirmed the claim that sleep disorders have a significant impact on the risk of infectious diseases, the onset and progression of several diseases, and on depression.[11] Given that workers in the industry are an important part of the human resources in any country, we should pay attention to their mental health and quality of life.[17-19] Although the effect of Covid-19 anxiety on sleep quality has been studied so far, this is a very new topic and needs a great deal of research. Therefore, this study aims to evaluate Covid-19 anxiety and its relationship with sleep quality in the industrial workers.

Material and methods

Type of study, participants and sampling method

This a descriptive cross-sectional study conducted in the egg production and packaging factory, in 2021. The target population in this study was administrative staff and workers in the industrial sector. Using random sampling, 212 people participated in the study according to the inclusion criteria. The questionnaires were completed for approximately 30 minutes. During the time of completing the questionnaire, the researcher was present at the workplace to clear the ambiguity and answer the questions accurately and completely. Inclusion criteria were having at least one year of work experience, not taking sedatives, not having more than 1 month off due to illness in the past year, no history of high blood pressure, no physical disability, no history of depression and other chronic diseases. Exclusion criteria were improper completion of questionnaires.

Data collection tools and methods

Data were collected by a self-report method using demographic information questionnaires, Covid-19 anxiety scale, and Pittsburgh Sleep Quality Index (PSQI).

Demographic information questionnaire: The demographic information questionnaire included items such as gender, marital status, age, work experience (year), BMI (Body Mass Index), job position, and level of education.

Corona Disease Anxiety Scale: The Corona Disease Anxiety Scale (CDAS), which has been validated by Alipour et al. in Iran, was used to measure anxiety. This tool included 18 questions and

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two dimensions. The dimension of psychological symptoms included questions 1 to 9, and the dimension of physical symptoms included questions 10 to 18. The instrument was scored on a 4-point Likert scale (never = 0, sometimes = 1, most of the time = 2, and always = 3), and finally the total anxiety intensity score ranged from 0 to 54. Higher scores indicated higher levels of anxiety in individuals. The cut-off point of this questionnaire was determined in Iran and divided into 3 domains of non-anxiety or mild (0-16), moderate (17-29), and severe (30-54). The reliability of this questionnaire was validated with Cronbach's alpha coefficient, which was equal to 0.91.[20]

Pittsburgh Sleep Quality Index (PSQI): The Pittsburgh Sleep Quality Index (PSQI) is a standardized self-report questionnaire introduced in 1989. It has gained widespread acceptance as a useful tool for assessing the sleep problems which may be related to anxiety, stress, and depression.[21] This questionnaire evaluated the quality of sleep with questions related to the previous month. It has 18 questions that are classified into 7 categories: quality of mental sleep (1 case), sleep delay (2 questions), duration of sleep (1 question), sleep efficiency (3 questions), sleep disorders (9 questions), use of sedatives (1 case) and dysfunction during the day (2 cases). Finally, it gave a number from 0 to 21. A total PSQI score greater than 5 indicated sleep disorders and poor sleep quality.[14, 22] The Persian version of this questionnaire had been validated by Malakouti et al. with a Cronbach's alpha coefficient of 0.86.[23]

Results

In this study, 212 workers and administrative staff participated. 167 (78.8%) of them were men and 168 (79.3%) were married. Their mean and standard deviation of age and work experience were 33.27 ± 6.6 and 7.24 ± 5.6 respectively. Other data related to the demographic variables of the study participants are reflected in Table 1.

The distribution of anxiety levels among participants is presented in Table 2. The mean total CDAS score was 11.60 ± 8.2 (Table 3). In addition, the score of psychological symptoms of anxiety was higher than physical symptoms (Table 3). According to the results of the Pearson correlation test, the authors observed a statistically significant relationship between age (P = 0.008) and work experience (P = 0.005), between the demographic characteristics and CDAS score of the participants. But the relationship between CDAS and participants' BMI was not significant (P = 0.113). Furthermore, based on the results of the independent t-test, between the variables of gender and marital status, and CDAS score of individuals, there was a statistically significant difference regarding gender (P = 0.002) and marital status (P = 0.012) among the participants. However, in the study of job variables, the researchers found that there was no statistically significant difference in CDAS score between the two groups of workers and administrative staff (P = 0.252), Table 4.

Table 1. Demographic Information of Participants (n= 212)

Variable	Classification	Frequency (percent)
Gender	Male	168(78.8)
	Female	45(21.2)
Marital status	Single	44(20.7)
	Married	168(79.3)
Job position	Worker	152(71.6)
	Administrative Staff	60(28.4)
Education	Lower than Diploma	40(18.8)
	Diploma	94(44.4)
	Bachelor	64(30.2)
	Higher than Bachelor	14(6.6)
		Mean±standard deviation
Age (year)		33.27±6.6
Work experience (year)		7.24±5.6
BMI (kg/m2)		24.93±3.5

Table 2. Classification of Participants at Different Levels of Anxiety (n = 212)

Levels of anxiety	Frequency (percentage)
Mild (0-16)	118(55.6)
Moderate (17-29)	63(29.8)
Severe (30-54)	31(14.6)

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The mean and standard deviation of the PSQI of the participants was 5.37 ± 1.7 (Table 3). Because a sleep quality score of less than or equal to 5 indicated a good sleep quality, the sleep quality of the study participants was in the unfavorable category. Based on the results of the Pearson correlation test, and demographic characteristics and PSQI score of the participants, the relationship between PSQI and BMI of participants was not significant (P = 0.360). But a statistically significant relationship was observed between age (P = 0.032) and work experience (P = 0.009). As the age and work experience increase, the PSQI score increase as well. As a result, the quality of sleep decreases. According to the results of the independent t-test, between the variables of gender, marital status, and job position, and PSQI score, there was a statistically significant difference in gender (P = 0.017) and job position (P = 0.044) in participants. But there was no statistically significant difference in PSQI score between married and single groups (P = 0.643), as shown in Table 4.

Correlation between CDAS and PSQI scores

To examine the correlation between PSQI and CDAS score, the researchers used the Pearson correlation test. A correlation coefficient (r = 0.341) was obtained, which showed a significant positive correlation between these two indicators (P = 0.007). The mean PSQI score for different levels of anxiety is also shown in Figure 1. Accordingly, increased anxiety can increase PSQI score, and thus, decrease sleep quality.

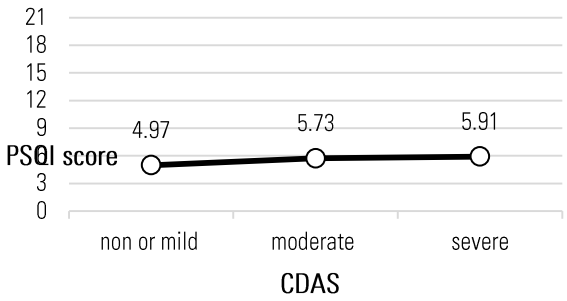

Figure 1. Mean PSQI Score at Different Levels of CDAS

Table 3. Mean and Standard Deviation of Participants' Scores and Subscales of Anxiety and Sleep Quality (n = 212)

Variable	Mean	Standard deviation
CDAS	11.60	8.2
Psychological symptoms	8.17	4.9
Physical symptoms	3.42	4.0
PSQI	5.37	1.7
Subjective sleep quality	1.11	0.59
Sleep latency	1.08	0.71
Sleep duration	0.76	0.50
Habitual sleep efficiency	0.41	0.68
Sleep disturbance	1.14	0.47
Sleeping medication use	0.27	0.39
Daytime dysfunction	0.60	0.52

Table 4. Comparison of Mean PSQI and CDAS Scores of the Participants (n = 212)

Variable	Gender / Marital status / Job position	Number	Mean	Standard deviation	standard error/Mean	P
CDAS	Male	167	10.68	7.4	0.57	0.002**
	Female	45	15.02	10.2	1.52	
PSQI	Male	167	5.19	1.2	0.73	0.017*
	Female	45	6.03	1.6	1.08	
CDAS	Single	44	8.84	7.1	1.07	0.012*
	Married	168	12.32	8.4	0.64	
PSQI	Single	44	5.59	1.5	0.65	0.643
	Married	168	5.31	1.5	0.92	
CDAS	Worker	152	12.01	8.5	0.69	0.252
	Administrative staff	60	10.56	7.4	0.95	
PSQI	Worker	152	5.60	1.3	0.64	0.044*
	Administrative staff	60	5.01	1.4	1.56	

P; P-value, *P-value<0.05, ** P-value<0.01

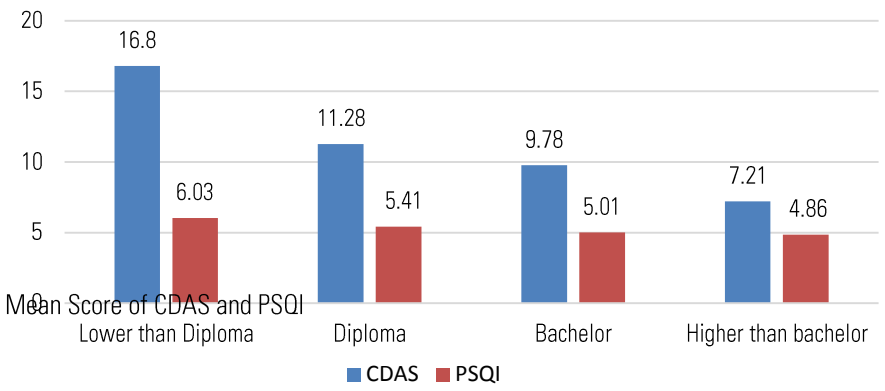

Figure 2. Comparing the Mean Score of CDAS and PSQI with Different Levels of Education (n = 212)

One-way ANOVA test was used to evaluate CDAS and PSQI scores with different levels of education. The results are presented in Figure 2. According to the results, a statistically significant difference in CDAS score was observed in individuals with different levels of education (P<0.001). PSQI score also showed a significant difference (P = 0.003). People with lower education levels experienced the most level of anxiety and the lowest quality of sleep, compared with other people.

Discussion

Since the beginning of Covid-19 pandemic, much research has been done on psychological aspects such as anxiety and sleep quality. But most of the research was on health care. In the present study, the level of anxiety and sleep quality, and the relationship between these two variables were evaluated in people working in the industrial sector. The overall results of the study emphasized the negative correlation between anxiety and sleep quality.

One of the important findings of the present study was the existence of a significant positive correlation between CDAS score and demographic variables of age and work experience. The study of Mattila et al., conducted in the community of employees, and the study of Alipour et al., conducted in the Iranian adult community, also showed a positive correlation between the anxiety score ,and age and work experience.[24, 25] The anxiety score in the present study was assessed at a mild level. But in the study by Alipour et al., as well as the one by Ismailzadeh et al., the anxiety score was moderate.[20, 25] Furthermore, in examining the level of education of the participants, the authors found that people with higher education level had lower anxiety. This was consistent with the results of a study by Mattila et al.[24] This can be due to increasing people's awareness by increasing their level of education, which is effective on mental health and reduces their anxiety.

According to the PSQI score obtained in this study, the participants' sleep quality was at an unsatisfactory level. The study by Bajracharya et al., as well as the study by Marelli et al., reported poor sleep quality in the university staff.[13, 14] One of the reasons for this can be the existence of job stress that affects mental health and sleep quality. The results of the present study, in line with other studies, showed a significant positive correlation between age and work experience of individuals with PSQI scores.[14, 26] This means that aging and work experience increase PSQI, and thus, decrease the sleep quality score. After examining the participants' education level, the authors found that people with higher education had better sleep quality.

Based on the Pearson correlation test, a significant positive correlation was observed between CDAS and

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PSQI scores. This means that increasing anxiety increases the PSQI score, and thus, reduces the quality of sleep. The results of the study by Xiao et al., in line with the present study, demonstrated that increased anxiety reduces the quality of sleep.[12] Increased anxiety in daily life can cause major problems for mental health, quality of life, and quality of sleep.

Conclusion

A large part of the human resources of any country are people working in industry. In the context of the Covid-19 pandemic regarding industry, there is a high probability that workers will gather indoors and use common equipment. This can increase people's anxiety, and thus, reduce their sleep quality. Therefore, the researchers suggest that factory managers make decisions and reduce the level of anxiety of these people by implementing a training program. In future studies, the researchers suggest that more sample populations, working hours, and shifts be taken into account. In the present study, as in other studies, there were limitations such as unwillingness of some of the employees to cooperate with the researcher.

Conflict of interest

The authors declared no conflict of interest in publishing this article.

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Authors Contribution

All authors contributed equally to the study.

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