



# Frequency of Obsessive-Compulsive Symptoms Related to Anxiety in Nurses Care for COVID-19 Patients: A Cross-sectional Study

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## Abstract

**Background:** Obsessive-compulsive disorder (OCD) is one of the most prevalent anxiety-related disorders caused by many environmental factors, including anxiety. The COVID-19 outbreak has exposed nurses to greater levels of occupational anxiety.

**Objectives:** This study aimed to investigate the frequency of obsessive-compulsive (OC) symptoms and the relationship between OC symptoms and anxiety in nurses of COVID-19 patients at Dr. Ganjavian hospital, Dezful, Iran.

**Methods:** This cross-sectional study encompassed 190 nurses working in units for COVID-19 patients meeting the inclusion criteria. They were evaluated using a demographic characteristics form, the Maudsley Obsessional Compulsive Inventory (MOCI), and the Spielberger State-Trait Anxiety Inventory (STAI) (Spielberger, 1983). Sampling was performed via a stratified random sampling method. The collected data were analyzed using descriptive statistics (absolute frequency and percentage) and analytical statistics (Pearson correlation coefficient and independent *t*-test) via SPSS version 21 at a significance level of 0.05.

**Results:** The study revealed that 74.4% of the participants showed OC symptoms, 47.4% stated anxiety below moderate, and 61.1% trait anxiety above moderate. The results of the Pearson correlation displayed that OC symptoms were significantly associated with state/trait anxiety ( $P = 0.001$ ). Furthermore, the independent *t*-test indicated that the mean score of OC symptoms was significantly higher in females ( $P = 0.03$ ) and married subjects ( $P = 0.006$ ).

**Conclusions:** The frequency of OC symptoms was high in nurses working in COVID-19 units, especially females and married subjects. There was also a significant relationship between OC symptoms and anxiety, such that anxiety increased with OC symptoms. Thus, it is suggested that nursing managers identify anxiety-causing factors in nurses to prevent more severe anxiety disorders.

**Keywords:** Anxiety, Care, COVID-19, Nurse, Obsessive-Compulsive Disorder (OCD), Obsessive-Compulsive (OC) Symptoms

## 1. Background

In December 2019, an outbreak of an anonymous disease of unidentified causality was initiated in Wuhan City, Hubei Province, China, with rapid circulation (1). Since June 24, 2020, the Chinese government has dispatched over 30,000 medical personnel to Wuhan Province to fight the disease (2). After a while, the cause of the condition was known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), a new virus belonging to the family of coronaviruses, and the World Health Organization introduced the corresponding disease as COVID-19 (3). Given its contagion, severe infection, mortality in severe cases, and the lack of any specific drug for definitive treatment, the disease has become a significant threat to human life and

health (4). Not only does it bring about death, but it also leads to severe psychological reactions such as stress, anxiety, and fear, causing other psychological disorders, e.g., stress, depression, and suicide (5).

Anxiety is a general and significant emotion of apprehension characterized by a scattered, vague, and uneasy feeling of dread and tension (6). This unpleasant feeling can accompany multiple physiological signs and emotional and mental symptoms. It manifests as a more intense emotional feeling that, if continued, can cause other psychological issues (7). If traumatic situations in life persist or occur several times, or the nervous system fails to put an end to stress resistance, anxiety develops in the person. It is noteworthy that all human beings undergo anx-

ity throughout their lives, yet chronic and severe anxiety is abnormal and complicated (8).

Obsessive-compulsive disorder (OCD) is one of the most common anxiety disorders characterized by recurring, persistent, and distressing thoughts, ideas, or tendencies that come to mind involuntarily, called obsessive thoughts. Subsequent recurring behaviors that tend to decrease anxiety associated with obsessive thoughts are called obsessive actions (9). These thoughts are time-consuming and excessive, causing substantial discomfort and anxiety in social, educational, occupational, and other important areas of a person's life. Many environmental factors contribute to OCD, such as anxiety (10). Additionally, Clark's view on OCD is that the level of susceptibility, high anxiety, negative emotion, equivocal self-appraisals, and non-adjusting metacognitive beliefs predispose the person to unwanted irritating thoughts to occur along with other factors like stress and negative mood (11). The studies by Amiri Pichakolaei et al. (7) and Zambrano-Vazquez and Allen (12) have approved the role of anxiety in the development and persistence of OCD symptoms. They documented the association between anxiety and OCD symptoms, such that anxiety underpins obsession (13).

In actuality, with increased external dreadful stimuli, the unsettling thoughts tend to elevate, and the misconception or the feeling of anxiety caused by the perception that "I am endangered" predisposes an individual to tangible danger (14). Therefore, the patient conducts repetitious actions just to relieve the accompanying anxiety; however, such actions do not always decrease anxiety and may even increase it (15). Although anxiety, to most people, is a typical and temporary response that guards them against potential trauma, morbid anxiety is associated with apprehension, dread, tension, irritating thoughts, physical symptoms, and stress. It can even cause and perpetuate greater psychological trauma. Studies have shown that 30% to 40% of patients with anxiety and depression have symptoms of OCD (16).

The outbreak of COVID-19 has faced medical staff with many challenges, such as heavy workload, risk of occupational injury and violence, the high infection risk to them and their families, and the requirement of personal protective equipment, which is per se an extra physical and psychological pressure (17, 18). Given the nature of their job, nurses spend more time caring for patients and are more predisposed to psychological concussions than physicians and other treatment team members (19). Accordingly, it was essential to perform a study on the frequency of anxiety-related OC symptoms among nurses caring for COVID-19 patients in Ganjavian hospital to improve the quality of health services and provide safer and more relaxed working conditions for health workers.

## 2. Objectives

This study investigated the frequency of obsessive-compulsive (OC) symptoms and the relationship between OC symptoms and anxiety in nurses of COVID-19 patients at Dr. Ganjavian hospital.

## 3. Methods

This cross-sectional study was conducted on 190 nurses working in the acute respiratory ward of Dezfoul Ganjavian hospital, Iran, from 22 Aug 2020 to 14 Jan 2021. The statistical population included all nurses working in the acute respiratory ward of Ganjavian hospital (N = 300). The sample size was calculated using the following formula:

$$n = \frac{Z^2 P (1 - P)}{d^2} \quad (1)$$

$$n = \frac{(3.84) (0.12) (1 - 0.12)}{0.002} \quad (2)$$

Therefore, the sample size was estimated to include 190 people. Sampling was performed via stratified random sampling method. In this way, considering the total number of nurses in each department, the share of that department was estimated in the total sample (193). Then, they were included in the study randomly from the specified stratum. The questionnaires were delivered to the participants electronically to complete them. It should be added that the sampling process took three months. Nurses participated in this investigation after informed consent was obtained. Inclusion criteria consisted of no history of suffering from mental illnesses, working in the COVID-19 ward for at least one month, and working in the clinical ward for at least one year.

### 3.1. Measures

Three self-report questionnaires were used in this study: (1) demographic questionnaire, (2) Maudsley Obsessional Compulsive Inventory (MOCI), and (3) Spielberger State-Trait Anxiety Inventory (STAI).

#### 3.1.1. Demographic Questionnaire

A researcher-made questionnaire collected demographic information, including age, gender, education, work experience, marital status, working shift, employment, and COVID-19 history.

### 3.1.2. Maudsley Obsessional Compulsive Inventory (MOCI)

Developed by Hodgson and Rachman, the MOCI (20) is a self-report questionnaire with a true-false format to assess the type of OC symptoms. It comprises 30 dichotomous items so that the total score for a subject will range between 0 (absence of symptoms) and 30 (maximum presence of symptoms). The original version has four subscales: Checking (nine items), cleaning (11 items), slowness (seven items), and doubting (seven items). This questionnaire has been endorsed in studies on clinical samples in various countries. In Iran, the content validity of the questionnaire was checked, and its reliability was evaluated through the test-retest method, obtaining a value of 0.89 - 0.98 (21-23). The general cutoff point for this questionnaire is 11 and higher, meaning that the sample under analysis suffers from OCD (15), with scores of 6, 7, 5, and 5 for the checking, cleaning, slowness, and doubting subscales, respectively (24).

### 3.1.3. Spielberger State-Trait Anxiety Inventory (STAI)

The STAI (25) is a self-report scale with 20 items for assessing trait anxiety and 20 for state anxiety on a four-point scale (e.g., from "almost never" to "almost always"). The scores of trait and state anxiety range from 20 to 80, with higher scores indicating greater anxiety. In Asadi et al. research in 2016, the reliability of the questionnaire using Cronbach's alpha was 0.92 and 0.90, indicating high reliability of this questionnaire (26).

Both inventories were validated and assessed in terms of reliability through the test-retest method twice and at 20-day intervals on 30 nurses who met the study's criteria. The correlation coefficients obtained for the MOCI and STAI were 0.88 and 0.82, respectively, which are acceptable.

## 3.2. Statistical Analysis

The collected data were analyzed using descriptive statistics (frequency, frequency percentage, mean, and standard deviation) and analytical statistics (Pearson correlation coefficient and independent *t*-test) using SPSS version 21 software at a significance level of 95% and a standard error of 0.05.

## 3.3. Ethical Considerations

Nurses participated in this investigation after informed consent was obtained. Also, the study was approved by the Ethics Committee of Dezfoul University of Medical Sciences (IR.DUMS.REC.1399.059).

## 4. Results

This study comprised 190 clinical nurses working at Dr. Ganjavian hospital of Dezfoul with an average age of 28 years, including 150 women and 40 men. Other demographic data are displayed in Table 1.

**Table 1.** Frequency and Frequency Percentage of Sample's Demographic Characteristics

| Variables                   | Frequency (%) |
|-----------------------------|---------------|
| <b>Gender</b>               |               |
| Male                        | 40 (21.1)     |
| Female                      | 150 (78.9)    |
| <b>Education</b>            |               |
| Post-diploma                | 8 (4.2)       |
| BA                          | 153 (80.5)    |
| MA                          | 29 (15.3)     |
| <b>Work experience</b>      |               |
| 1 - 10                      | 122 (64.2)    |
| 11 - 20                     | 53 (27.9)     |
| 21 - 30                     | 15 (7.9)      |
| <b>Marital status</b>       |               |
| Married                     | 96 (50.5)     |
| Single                      | 94 (49.5)     |
| <b>Working shift</b>        |               |
| Fixed                       | 17 (8.9)      |
| Circulating                 | 173 (91.1)    |
| <b>Employment</b>           |               |
| Permanent                   | 61 (32.1)     |
| Temporary to permanent      | 46 (24.2)     |
| Contractual                 | 40 (21.1)     |
| Corporate-based             | 27 (14.2)     |
| Conscription laws conscript | 16 (8.4)      |
| <b>COVID-19 history</b>     |               |
| Yes                         | 122 (64.2)    |
| No                          | 68 (35.8)     |

Most participants ( $n = 142$ ; 74.7%) showed OC symptoms, 47.4% showed overtly moderate symptoms of state anxiety, and 61.1% exhibited moderate to high trait anxiety symptoms (Table 2).

The Pearson correlation coefficient was significant at a 0.05 error level, so the null hypothesis was rejected, and the test was significant. Given the positive correlation value, there was a direct relationship between the variables. Accordingly, we conclude with 95% confidence that

**Table 2.** Frequency and Frequency Percentage of Participants in Terms of Obsessive-Compulsive Symptoms, State and Trait Anxiety

| Variables and Domain | No. (%)    |
|----------------------|------------|
| <b>OC symptoms</b>   |            |
| Yes                  | 142 (74.7) |
| No                   | 48 (25.3)  |
| <b>State anxiety</b> |            |
| Mild                 | 34 (17.9)  |
| ≤ Moderate           | 90 (47.4)  |
| ≥ Moderate           | 34 (17.9)  |
| Relatively high      | 17 (8.9)   |
| High                 | 9 (4.7)    |
| Very high            | 6 (3.2)    |
| <b>Trait anxiety</b> |            |
| ≤ Moderate           | 48 (25.3)  |
| ≥ Moderate           | 116 (61.1) |
| Relatively high      | 26 (13.7)  |

there was a direct relationship between OC symptoms and gender (females) and more work experience (Table 3).

An evaluation of the relationship between OC symptoms and demographic characteristics using an independent *t*-test showed that the mean scores of OC symptoms were higher in females and married subjects (Table 4).

The Pearson correlation coefficient was significant at 0.05 error, so the null hypothesis was rejected, and the test was significant. Given the positive correlation value, there was a direct relationship between the variables. Accordingly, we conclude with 95% confidence that there was a direct relationship between OC symptoms and anxiety (Table 5).

## 5. Discussion

The present study involved 190 nurses working in COVID-19 units, primarily women with a mean age of 28 years, a bachelor's degree, and less than 10 years of work experience. The current study revealed that most nurses working at COVID-19 units exhibited OC symptoms with moderately low and moderately high levels of state and trait anxiety, respectively. The frequency of OC symptoms was shown to be higher in married women and individuals with more work experience. Also, OCD and anxiety in nurses were related such that the more severe the signs of OCD, the higher their anxiety level, and vice versa.

The obsessive-compulsive disorder usually occurs gradually, arising mainly in early adolescence or early adulthood after a stressful occasion such as pregnancy,

childbirth, and problems caused by emotional and occupational relationships (13). With a lifetime prevalence of nearly 2.3%, OCD is most commonly associated with diseases such as anxiety and depression (27). According to this study, there was a high prevalence of OCD among nurses during the COVID-19 crisis, which is in line with the study by Ergenc et al. (28), which also showed a higher prevalence of anxiety, depression and OCD in medical staff in COVID-19 units than in those in non-COVID-19 ones.

In addition to healthcare staff, the disorder has extended to medical students, as a study performed in Iraq discovered that the prevalence of OCD among medical students was high during the COVID-19 outbreak (29), which agrees with the present study. In their study, De Kock et al. enumerated factors that aggravate OCD, including physical illness, family anxiety, fear of infection, fear of decreased protective equipment, and contact with COVID-19 patients (30). In the present study, the symptoms of OCD were connected to gender (females) and work experience, observed more frequently in female nurses with higher work experience, which is consistent with this research (30).

Given that OCD occurs in different individuals with varying severity, people diagnosed with OCD are more likely to undergo a recurrence than those in the subclinical stage of the disorder (31), and OCD is shown not to be related to gender, family history, and years of education (32). Huang and Zhao examined the psychological consequences nurses were exposed to during the outbreak. Their results were inconsistent with those of the present study, as participants in the latter experienced considerable negative emotions such as sorrow and anxiety. According to our results, most nurses (72%) suffered from severe anxiety. Likewise, the study by Huang and Zhao showed that the high prevalence of COVID-19 and poor quality of sleep in coronary heart disease contributed to anxiety in nurses (33). In another study by Nemati et al., nurses exposed to COVID-19 patients in Iran exhibited high levels of anxiety caused by factors such as apprehension, epidemic control, and lack of medical facilities throughout the country. This finding is inconsistent with the present study's (34), yet it agrees with Hosseinzadeh-Shanjani et al (35). They revealed that the medical staff's anxiety was normal during COVID-19 (35).

No relationship was seen between state anxiety, gender, and age, yet it was related to marital status (single) and type of working shift (fixed shift). In Huang and Zhao's study, one-third of the participants indicated generalized anxiety disorder, which did not differ between men and women during the COVID-19 outbreak, which is consistent with our study (33). Nevertheless, it does not agree with the study by Lai et al. that showed anxiety scores in female

**Table 3.** Relationship Between Obsessive-Compulsive Symptoms and Demographic Characteristics in Research Sample According to Pearson Correlation Test

| Predictive (Independent) and Dependent Variables | OC Symptoms in Nurses Caring for COVID-19 Patients |                   |      |     |                |
|--|--|-------------------|------|-----|----------------|
|  | Pearson Correlation Coefficient                    | Sig. <sup>a</sup> | SEM  | No. | Result         |
| Age  | -0.010   | 0.88              | 0.05 | 190 | H0 approved    |
| Gender   | -0.152   | 0.036             | 0.05 | 190 | H0 disapproved |
| Education  | 0.100  | 0.16              | 0.05 | 190 | H0 approved    |
| Work experience                                  | 0.183  | 0.012             | 0.05 | 190 | H0 disapproved |
| COVID-19 history                                 | -0.037   | 0.61              | 0.05 | 190 | H0 approved    |

<sup>a</sup> Significant at 0.01 level; significant at 0.05 level.

**Table 4.** Results of the Independent *t*-Test to Investigate the Difference in the Mean of Obsessive-Compulsive Symptoms and State-Trait Anxiety Type in Nurses of COVID-19 Patients Based on Gender, Marital Status, and Working Shift

| Group                 | No  | Mean ± SD     | Mean Difference | df  | t     | Sig   | Result         |
|-----------------------|-----|---------------|-----------------|-----|-------|-------|----------------|
| <b>OC Symptoms</b>    |     |               |                 |     |       |       |                |
| <b>Gender</b>         |     |               | 1.05            | 188 | 2.10  | 0.036 | H0 disapproved |
| Female                | 150 | 13.83 ± 2.74  |                 |     |       |       |                |
| Male                  | 40  | 12.77 ± 3.10  |                 |     |       |       |                |
| <b>Marital status</b> |     |               | 1.12            | 188 | 2.77  | 0.006 | H0 disapproved |
| Single                | 96  | 13.05 ± 2.71  |                 |     |       |       |                |
| Married               | 94  | 14.18 ± 2.88  |                 |     |       |       |                |
| <b>Working shift</b>  |     |               | 0.427           | 188 | 2.49  | 0.013 | H0 disapproved |
| Fixed                 | 17  | 14.00 ± 17.16 |                 |     |       |       |                |
| Circulating           | 173 | 13.57 ± 2.84  |                 |     |       |       |                |
| <b>State Anxiety</b>  |     |               |                 |     |       |       |                |
| <b>Gender</b>         |     |               | 0.573           | 188 | 0.251 | 0.80  | H0 approved    |
| Female                | 150 | 41.82 ± 12.37 |                 |     |       |       |                |
| Male                  | 40  | 42.40 ± 14.40 |                 |     |       |       |                |
| <b>Marital status</b> |     |               | 4.02            |     | 2.18  | 0.030 | H0 disapproved |
| Single                | 96  | 43.93 ± 13.46 |                 |     |       |       |                |
| Married               | 94  | 39.91 ± 11.78 |                 |     |       |       |                |
| <b>Working shift</b>  |     |               | 8.00            | 188 | 2.42  | 0.013 | H0 disapproved |
| Fixed                 | 17  | 49.23 ± 17.16 |                 |     |       |       |                |
| Circulating           | 173 | 41.23 ± 12.10 |                 |     |       |       |                |
| <b>Trait Anxiety</b>  |     |               |                 |     |       |       |                |
| <b>Gender</b>         |     |               | 0.308           | 188 | 0.324 | 0.74  | H0 approved    |
| Female                | 150 | 47.03 ± 5.28  |                 |     |       |       |                |
| Male                  | 40  | 46.72 ± 5.570 |                 |     |       |       |                |
| <b>Marital status</b> |     |               | 0.842           | 188 | 1.09  | 0.27  | H0 approved    |
| Single                | 96  | 47.38 ± 5.30  |                 |     |       |       |                |
| Married               | 94  | 46.54 ± 5.35  |                 |     |       |       |                |
| <b>Working shift</b>  |     |               | 2.10            | 188 | 1.55  | 0.12  | H0 approved    |
| Fixed                 | 17  | 48.88 ± 5.98  |                 |     |       |       |                |
| Circulating           | 173 | 46.78 ± 5.24  |                 |     |       |       |                |

**Table 5.** Relationship Between Obsessive-Compulsive Symptoms and State-trait Anxiety Types in Research Sample According to Pearson Correlation Test

| Predictive (Independent) and Dependent Variables | OC Symptoms in Nurses Caring for COVID-19 Patients |       |      |     |             |
|--|--|-------|------|-----|-------------|
|  | Pearson Correlation Coefficient                    | Sig.  | SEM  | No. | Result      |
| State anxiety                                    | 0.340  | 0.001 | 0.05 | 190 | H0 approved |
| Trait anxiety                                    | 0.380  | 0.001 | 0.05 | 190 | H0 approved |

nurses were higher than those of male nurses (36). Sarbooji Hosein Abadi et al. also reported that anxiety was significantly higher in individuals aged 41 - 50, which is inconsistent with our study (37). Additionally, Kaveh et al. indicated that younger age was associated with higher levels of anxiety, education, and work experience among older medical staff in stressful hospital environments. This can lead to a better understanding of COVID-19 and effective ways of using personal protective equipment (38). The results of our study demonstrated a direct relationship between OCD symptoms and anxiety level, as the higher the severity of OC symptoms, the higher the level of anxiety, which is consistent with the study by Viswanath et al., showing that the occurrence of OCD determines anxiety levels (39). In fact, OCD symptoms can predict the onset of anxiety or depressive disorder in healthy patients with no previous mental disorder, as well as a recurrence in patients with treated anxiety or depression disorder or persistence in patients with anxiety disorder and depression together (16). Hence, screening and early detection of primary anxiety in nurses are crucial to prevent more severe anxiety disorders.

### 5.1. Conclusions

This study displayed the high frequency of OC symptoms among nurses working in COVID-19 units of Ganjavian hospital. The OC symptoms were more severe in married women and individuals with more work experience. Also, OC symptoms and anxiety were associated, as the higher the level of anxiety, the more severe the obsessive symptoms. Thus, if anxiety is appropriately managed, more severe anxiety disorders can be contained in the future. It is recommended that government politicians and managers provide serious psychological and financial support to nurses, facilitate access to mental health services, and make regular screening by psychologists a priority to ensure nurses' mental health.

### 5.2. Limitations

This study had some limitations. First, the lack of access to the level of OCD of the nurses participating in the present study before the pandemic made it impossible to confirm the pandemic as the exact cause of anxiety and OC symptoms. Hence, longitudinal research is necessary

to confirm the pandemic's effect on nurses' psychological well-being. Second, this study was conducted in an educational and medical center affiliated with the Dezfoul University of Medical Sciences. Thus, a caveat is in order when generalizing the findings to other centers. However, regardless of these limitations, the current study investigated, for the first time, OC symptoms and their associated factors using standard tools during the COVID-19 outbreak among nurses. It is recommended to conduct a study with a larger sample size in the future.

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### Footnotes

**Authors' Contribution:** M. B., B. SH. and N. R. conceived and designed the survey and drafted the manuscript. L. K. participated in designing the survey, performed parts of the statistical analysis, and helped to draft the manuscript. E. R. P. re-evaluated the clinical data, performed the statistical analysis, and revised the manuscript. Z. N. KH. collected the data, interpreted them, and revised the manuscript. L. K. re-analyzed the clinical and statistical data and revised the manuscript. All authors read and approved the final manuscript.

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**Informed Consent:** Nurses participated in this investigation after informed consent was obtained.

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