



# Relationship between Anxiety Resulting from COVID-19 and Mental Health in the Population Over 18 Years Old in Qaemshahr, Iran, 2021

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## Abstract

**Background:** COVID-19, the third pandemic of the 21<sup>st</sup> century, is highly contagious and can cause anxiety due to the development of serious physical problems and the reduction of quality of life. Anxiety is a psychological state experienced by nearly all humans during their lives. However, it is considered a mental disorder if it exceeds its moderate level.

**Objectives:** Therefore, the present study aimed to determine the anxiety level, mental health, and their related factor in the population above 18 years old in Qaemshahr, Iran.

**Methods:** This descriptive, correlational study was conducted on 400 individuals in Qaemshahr County who were selected by convenience sampling in 2021. Given the population of this county, convenience sampling was employed to select 40% of the participants from the rural population and 60% from the urban population. The data were collected using a demographic questionnaire (7 items), the Corona Disease Anxiety Scale, including somatic (physical) anxiety and psychic (mental) anxiety sections, and the 12-item General Health Questionnaire. Descriptive and inferential statistical tests were used for data analysis.

**Results:** The mean score of mental health was  $22.93 \pm 8.9$ , which accounted for 63.69% of the total score of the questionnaire. The total mean score of anxiety was also measured at  $9.46 \pm 6.89$ , which contributed to 31.53% to the total score of the questionnaire. According to the results, physical anxiety per se predicted 31% of the dependent variable (mental health).

**Conclusion:** It can be concluded that critical conditions affect individuals' anxiety and mental health levels. Therefore, it is essential to pay more attention to the people who lack sufficient socioeconomic support systems.

**Keywords:** Anxiety, COVID-19, Mental health, Somatic anxiety

## 1. Background

Coronaviruses comprise a large family of viruses that can cause respiratory infections ranging from the common cold to more acute diseases, such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) (1). Coronavirus Disease 2019 (COVID-19) is a previously unknown novel coronavirus. Patients with COVID-19 experience various symptoms resembling those of the flu or the common cold (2). Considered the third pandemic in the 21<sup>st</sup> century, this disease is so contagious that threatens the world population (3). The public and the health staff feel in danger and are uncertain about the future due to the lack of accepted and agreed-upon medications and treatments, the complexity and unknown nature of the disease in terms of clinical manifestations, its modes of transmission, and unpredictable outcomes (4–6).

The destructive, fatal spread of this disease and the media propaganda have also exerted intense pressure on individuals, communities, policymakers,

and general managers, most of whom lack similar experiences in their personal and professional lives (4). On the other hand, the wheels of socioeconomic life have been slowed down by policies and recommendations, such as staying at home voluntarily and enforcing laws if necessary, banning social gatherings, and closure of schools and offices. These wheels have stopped in many societies (6).

Despite positive outcomes, implementing health policies can have negative psychological effects on communities. Fear of the disease, fear of death, dissemination of misinformation and rumors, interference in everyday activities, bans and restrictions on travel and traffic, and reduction of social relationships are among the factors that threaten people's mental health (7–10). Studies have shown that the occurrence of respiratory diseases can cause disease-related anxiety due to serious physical problems and reduced quality of life (8). Anxiety is a psychological state experienced by nearly all people through their lifetime. However,

it is considered a psychological disorder if it exceeds the moderate level (11). Anxiety refers to a feeling of vague, extreme, and uncontrollable worry with physical symptoms in the absence of specific objects, stimuli, and situations (12). COVID-19 anxiety has been defined as the worry resulting from the disease. The reason for the development of this anxiety is often unknown, and it creates cognitive unclarity (13,14).

Lack of sufficient scientific information intensifies the anxiety associated with COVID-19 (14). People with high health anxiety levels tend to misinterpret good physical feelings and changes. As for the spread of COVID-19, based on previous experiences regarding the flu, individuals with high health anxiety levels may misinterpret benign muscle pains or coughs as COVID-19 symptoms, which in turn intensifies the anxiety and adversely affects the ability to make logical decisions (15). According to a cross-sectional study conducted on the medical staff in China during the COVID-19 pandemic, the prevalence of anxiety was nearly 12.5% (16). Anxiety has been also considered a threat to mental health (17). A mental health disorder is a kind of worry and preoccupation with physical, mental, and social aspects, which people have with regard to their health-related problems and even those of others (18). Constantly worrying about their health, such individuals always check their physical health and vital signs (19), which can, in turn, lead to the emergence of psychological disorders (e.g., anxiety and depression) as well as the increased use of psychological and healthcare services (20). Research has indicated that people experienced high anxiety levels and worries about health during the COVID-19 pandemic (21–23). Karimi and Izadi reported that decrease in stress, anxiety, and depression was accompanied by mental health and general health enhancements (24). Therefore, in addition to considering hygiene measures to cope with COVID-19, people must take psychological care into account to mitigate stress. Consequently, it is essential to perceive the potential psychological changes caused by COVID-19 in time, as the psychological changes resulting from public health emergencies can be directly reflected in people's feelings and behaviors (25, 26).

## 2. Objectives

Since the continuation of the critical condition, compulsory or voluntary restrictions, and self-isolation will have destructive effects on different groups in the community, it is necessary to determine the psychological outcomes of the COVID-19 pandemic to implement suitable and relevant interventions and to mitigate the effects of anxiety, based on appropriate educational and behavioral models (27). Hence, the present study aims to

evaluate the correlation between the anxiety level and mental health in the population above 18 years old in Qaemshahr, Iran.

## 3. Methods

### 3.1. Study Design and Samples

In this descriptive correlational study, the statistical population included 400 individuals above 18 years old in Qaemshahr County who were selected by convenience sampling in 2021. Considering the population of this county, convenience sampling was employed to select 40% of the participants from rural areas and 60% of the participants from urban ones. The inclusion criteria were aging above 18 years, being able to speak or read and write to complete the questionnaires, not being afflicted with COVID-19 during the questionnaire completion process, and being willing to cooperate. The exclusion criterion was unwillingness to fill out the study questionnaires.

### 3.2. Data Collection

The questionnaires were distributed among the participants and were then collected in full compliance with health protocols. Due to the spread of COVID-19 and the associated restrictions, the target group was accessed using all the places and the people that could help with the procedure.

The data were collected using a demographic questionnaire, the Corona Disease Anxiety Scale (CDAS), and the 12-item General Health Questionnaire (GHQ). The demographic questionnaire included seven items on age, gender, marital status, education level, place of residence, economic status of the family, and sources of obtaining health information.

The CDAS included two five-item sections; i.e., anxiety with psychological symptoms and anxiety with somatic symptoms. The items could be responded to through a four-point Likert scale (from 0 to 3), and higher scores represented higher anxiety levels. This tool was created and validated by Alipour et al. who reported Guttman's lambda-2 of 0.922 and Cronbach's alpha of 0.919 for the whole questionnaire (13).

The GHQ-12 contained 12 self-report items that evaluated the ability to concentrate, insomnia, feeling of usefulness, ability to make decisions, feeling of inability to overcome hardships, enjoying daily activities, ability to deal with problems, feelings of sadness and depression, loss of self-confidence, feeling of unworthiness, and feeling of logical happiness over the past week. The items could be responded to via a four-point Likert scale (from "no" to "very much") (28), and reverse scoring was employed for some items (0 and 3 for "no" and "very much" responses, respectively). Additionally, higher scores indicated higher levels of mental health. This questionnaire was

validated by Yaghoubi et al., revealing a Cronbach's alpha coefficient of 0.92. Moreover, in this 36-point scoring system, the cutoff point of 15 was considered for one phase of the test (29).

### 3.3. Ethical Consideration

All the participants were informed about the purposes of the study and their written consent forms were obtained. All the participants were assured that their information would remain confidential. They were also informed about their right to withdraw from the study at any time. This study was approved by the Research Ethics Committee of Mazandaran University of Medical Sciences (Ethics Code: IR.MAZUMS.REC1398.7257).

### 3.4. Data Analysis

Descriptive and inferential statistical tests (multiple linear regression analysis, independent sample t-test,

one-way ANOVA, and Pearson's test) were used in the SPSS software (version 25) for data analysis.

## 4. Results

The mean age of the target group was  $36.38 \pm 11.63$  years, and 44.30% of the participants were male. Besides, 30.50% of the participants lived in rural areas, and 67% were married. Moreover, 55.50% of the participants had academic degrees, 57.80% had medium economic status, and 88.00% had normal mental health levels. The majority of the participants (40.3%) received information about COVID-19 from medical staff (Table 1).

The mean score of mental health was  $22.93 \pm 8.9$ , which accounted for 63.69% of the total score of the questionnaire. The total mean score of anxiety was  $9.46 \pm 6.89$ , which contributed to 31.53% to the total score of the questionnaire (Table 2).

**Table 1.** Demographic characteristics of the study participants

| Variable  | Mean  | N (%)       |
|---|---|-------------|
| Age   | 36.38±11.63                                 |             |
| Gender  |   |             |
|   | Male  | 177 (44.30) |
|   | Female                                      | 223 (55.80) |
| Place of residence  |   |             |
|   | Urban areas                                 | 278 (69.50) |
|   | Rural areas                                 | 122 (30.50) |
| Marital status  |   |             |
|   | Single (never married)                      | 120 (30.00) |
|   | Married                                     | 268 (67.00) |
|   | Others (e.g., divorced, widowed, separated) | 12 (3.00)   |
| Educational level   |   |             |
|   | Illiterate                                  | 1 (0.30)    |
|   | Primary School                              | 13 (3.30)   |
|   | Middle School                               | 27 (6.80)   |
|   | High School                                 | 18 (4.50)   |
|   | Diploma                                     | 119 (29.80) |
|   | Academic                                    | 222 (55.50) |
| Economic status   |   |             |
|   | Poor  | 37 (9.30)   |
|   | Average                                     | 231 (57.80) |
|   | Good  | 117 (29.30) |
|   | Very Good                                   | 8 (2.00)    |
|   | Great                                       | 7 (1.80)    |
| The most important source of acquiring health information |   |             |
|   | Medical and health staff                    | 161 (40.30) |
|   | TV  | 158 (39.50) |
|   | Radio                                       | 5 (1.30)    |
|   | Books                                       | 1 (0.3)     |
|   | Press                                       | 1 (0.3)     |
|   | Friends and colleagues                      | 7 (1.80)    |
|   | Others (e.g., Internet, cyberspace, etc.)   | 67 (16.80)  |
| Mental Health   |   |             |
|   | Unhealthy                                   | 48 (12.00)  |
|   | Healthy                                     | 352 (88.00) |

**Table 2.** Mean scores of anxiety and mental health

| Variable         | Mean ± SD  | Percentage of scores obtained | Score range | Maximum score | Minimum score |
|------------------|------------|-------------------------------|-------------|---------------|---------------|
| Physical anxiety | 3.22±2.94  | 21.46                         | 0-15        | 15            | 0             |
| Mental anxiety   | 6.24±3.52  | 46.60                         | 0-15        | 15            | 0             |
| Total anxiety    | 9.46±6.89  | 31.53                         | 0-30        | 30            | 0             |
| Mental health    | 22.93±8.90 | 63.69                         | 0-36        | 36            | 0             |

According to the results of the multiple linear regression analysis regarding the association of mental health with anxiety dimensions and underlying variables, physical anxiety per se predicted 31% of the dependent variable; i.e., mental health [ $P < 0.001$ , Table 3].

Pearson's correlation coefficient was employed to

determine the correlation between mental health and anxiety. The results indicated that mental health was negatively correlated to anxiety and its dimensions (Table 4).

The results of independent sample t-test indicated no significant relationships between the underlying variables (gender and place of residence) and

**Table 3.** Results of stepwise liner regression analysis between the underlying variables and anxiety dimensions, and mental health

| Criterion variable   | Steps | Predictive variable                                  | R    | R2   | Adjusted R2 | F      | P      | B                      | β                      | T                      | P                         |
|----------------------|-------|--|------|------|-------------|--------|--------|------------------------|------------------------|------------------------|---------------------------|
|                      | 1     | Physical anxiety                                     | 0.55 | 0.31 | 0.31        | 181.17 | <0.001 | -0.97                  | -0.55                  | 13.46                  | <0.001                    |
|                      | 2     | Physical anxiety<br>economic status                  | 0.58 | 0.33 | 0.33        | 101.49 | <0.001 | -0.97<br>1.50          | -0.55<br>0.16          | -13.66<br>3.91         | <0.001<br><0.001          |
| <b>Mental health</b> | 3     | Physical anxiety<br>Economic status<br>Mental health | 0.59 | 0.35 | 0.34        | 71.75  | <0.001 | -0.77<br>1.39<br>-0.32 | -0.44<br>0.14<br>-0.16 | -7.81<br>3.63<br>-2.90 | <0.001<br><0.001<br>0.004 |

**Table 4.** Matrix of Pearson’s correlation between mental health and anxiety dimensions\*

| Variable                | Mental health        | Mental anxiety      | Physical anxiety    | Total anxiety |
|-------------------------|----------------------|---------------------|---------------------|---------------|
| <b>Mental health</b>    | 1                    |                     |                     |               |
| <b>Mental anxiety</b>   | R = -0.48<br>P<0.001 | 1                   |                     |               |
| <b>Physical anxiety</b> | R = -0.55<br>P<0.001 | R = 0.69<br>P<0.001 | 1                   |               |
| <b>Total anxiety</b>    | R = -0.56<br>P<0.001 | R = 0.91<br>P<0.001 | R = 0.93<br>P<0.001 | 1             |

**Table 5.** Mean scores of mental health and anxiety dimensions based on the place of residence and gender\*

| Variables               | Underlying variables | Frequency | Mean ± SD  | P value* |
|-------------------------|----------------------|-----------|------------|----------|
| <b>Physical anxiety</b> | Male                 | 177       | 3.01±2.71  | 0.34     |
|                         | Female               | 223       | 3.39±2.12  |          |
| <b>Mental anxiety</b>   | Male                 | 177       | 6.23±3.28  | 0.96     |
|                         | Female               | 223       | 6.24±3.71  |          |
| <b>Total anxiety</b>    | Male                 | 177       | 9.24±6.39  | 0.57     |
|                         | Female               | 223       | 9.63±7.26  |          |
| <b>Mental health</b>    | Male                 | 177       | 23.29±6.58 | 0.35     |
|                         | Female               | 223       | 22.64±7.16 |          |
| <b>Physical anxiety</b> | Urban areas          | 278       | 3.15±2.96  | 0.60     |
|                         | Rural areas          | 122       | 3.37±2.85  |          |
| <b>Mental anxiety</b>   | Urban areas          | 278       | 6.24±3.46  | 0.91     |
|                         | Rural areas          | 122       | 6.22±3.69  |          |
| <b>Total anxiety</b>    | Urban areas          | 278       | 9.39±6.84  | 0.78     |
|                         | Rural areas          | 122       | 9.60±7.01  |          |
| <b>Mental health</b>    | Urban areas          | 278       | 23.05±7.24 | 0.58     |
|                         | Rural areas          | 122       | 22.64±6.10 |          |

\*Independent sample t-test

anxiety, its dimensions, and mental health [P>0.05, Table 5].

The results of one-way ANOVA revealed a significant relationship between mental anxiety and marital status (P=0.02). Additionally, the LSD post-hoc test showed differences between single participants and married and other participants (e.g., divorced and widowed) as well as between the married participants and other ones (e.g., divorced

and widowed) in terms of the mean scores of mental anxiety.

The results of the current study revealed a significant relationship between mental health and economic status (P=0.003). Tukey’s post-hoc test indicated a significant difference between the participants with low economic levels and those with medium and high economic levels, regarding the mean score of mental health (Table 6).

**Table 6.** Mean scores of mental health and anxiety dimensions based on marital status and economic status\*

| Variables             | Underlying variables | Frequency                                   | Mean±SD | P value*    | Post-hoc |   |
|-----------------------|----------------------|---|---------|-------------|----------|---|
| <b>Mental anxiety</b> | Marital status       | Single (never married)                      | 120     | 5.63±3.19   | 0.02     | Single vs. married, Others and married vs. others |
|                       |                      | Married                                     | 268     | 6.43±3.60   |          |   |
|                       |                      | Others (e.g., divorced, widowed, separated) | 12      | 7.91±4.20   |          |   |
| <b>Mental health</b>  | Economic status      | Poor  | 81      | 19.05±10.23 | 0.003    | Poor vs. average and good                         |
|                       |                      | Average                                     | 113     | 22.92±6.43  |          |   |
|                       |                      | Good  | 109     | 24.00±6.26  |          |   |
|                       |                      | Very good                                   | 77      | 22.50±6.21  |          |   |
|                       |                      | Great                                       | 20      | 26.28±5.31  |          |   |

\*One-way analysis of variance (ANOVA)

## 5. Discussion

This research aimed to assess the relationship between anxiety and mental health. According to the World Health Organization (WHO), health means not only the absence of a disease, but also complete physical, mental, and social well-being. All aspects of health are interrelated (30). Therefore, it is necessary to analyze mental health changes with respect to psychological factors.

The current study findings indicated a significant negative correlation between mental health and anxiety about COVID-19. In other words, the higher the anxiety level, the lower the level of mental health would be. Additionally, anxiety explained 36% of the variance in mental health. Thus, it was considered an underlying variable threatening health (8). Susan Alizadeh Fard et al. also reported that anxiety could explain 47% of the variance in mental health (31). Therefore, it is essential to consider the major role of anxiety in mental health during crises and take it into account in developing effective interventions.

Generally, fear of the unknown reduces people's perception of immunity and causes anxiety. This is also true regarding the COVID-19 crisis (14). Davillas and Jones disclosed in their research that the prevalence of psychological stress increased from 18.5% before the COVID-19 crisis to 27.7% during the pandemic (32). Other studies have also referred to an increase in mental health problems during the COVID-19 pandemic (33).

According to the results of the present investigation, the mean score of mental anxiety was higher in the married and other participants (divorced, widowed, etc.) than in single ones. In other words, married and other participants (divorced, widowed, etc.) experienced higher levels of mental anxiety compared to single ones, which could be associated with worrying about the affliction of family members with COVID-19. The people who were more worried about affliction with COVID-19 had, in turn, lower levels of mental health. Other studies also indicated that people experienced worries and fears during the COVID-19 pandemic because they were afraid that they or their family members might be afflicted with the disease (34). On the other hand, single participants showed higher levels of mental health; because they benefited from familial support and had fewer responsibilities. In the same vein, Li et al. demonstrated that married and divorced women experienced higher levels of stress in comparison to single individuals (35). Furthermore, domestic violence and marital tension have escalated during the COVID-19 pandemic due to long stays at home and increased duration of couple's interactions. Although people love each other, staying with each other in a small space can reduce their tolerance and forbearance. Known as a serious threat to physical and mental health, COVID-19 has

adversely affected people's lives by impacting their behaviors and creating negative feelings and severe fear. According to a literature review, there have been worldwide psychological outcomes affecting mental health at personal, interpersonal, and social levels (36). At the same time, single individuals have shown lower compliance with home quarantine policies compared to married and divorced ones (37). In the current study, the mean score of mental anxiety was higher in divorced and widowed individuals compared to the married participants. In other words, divorced and widowed participants experienced higher levels of mental anxiety in comparison to the married ones. Considering divorced women, compliance with home quarantine policies means further responsibilities, because they are engaged in economic activities and childcare and implementation of stay-at-home policies further increases their responsibilities (27), which can affect their anxiety and mental health levels.

The present research results indicated that gender had no effects on anxiety level and mental health. Likewise, males and females had similar stress levels in some studies conducted during the prevalence of respiratory diseases (38, 39).

In the current research, the mean score of mental health was higher in the participants with medium and high levels of economic status than in those with low levels of economic status. In other words, people with medium and high levels of economic status were mentally healthier, which was confirmed in other studies (40, 41).

It can be concluded that critical conditions affect individuals' anxiety and mental health levels. Thus, it is essential to pay more attention to the people who lack sufficient socioeconomic support systems.

In the present study, the majority of the participants stated that the most important way of acquiring health-related information was through the healthcare staff, which showed their trust in the health staff. Therefore, the healthcare staff has the important responsibility of providing the public with accurate, necessary, and timely information during such crises as the COVID-19 pandemic. On the other hand, evidence has revealed high anxiety levels among the people who follow the news about COVID-19 (42). As a result, education is very helpful and important if it is provided in different ways and at the right time by reliable experts.

The most important limitation of the present research was the lack of easy access to the target group due to the spread of COVID-19. In this research, a questionnaire was used to collect data, so it is possible that some people refused to provide honest answers and gave unrealistic answers. Further studies are suggested to be conducted in other regions to identify their health priorities and implement effective interventions. It is suggested to pay more attention to people's mental health during

crises and the preparations for this go back to before the crisis.

## 6. Conclusion

Although this study was conducted during the third wave of COVID-19, the participants still felt anxious. According to the results of this research, it can be concluded that anxiety has effects on reducing the mental health of people during the pandemic and acts as an underlying and threatening variable to health. The average score of mental anxiety in married people and other cases (divorced, widowed, etc.) is higher than in single people. Therefore, it is necessary to identify talented people at different levels of the society whose mental health may be endangered due to crises caused by the current social and economic situation of the society and people should be helped with appropriate solutions and interventions to maintain their mental health.

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## Footnotes

**Conflicts of Interest:** The authors declare that they have no conflict of interest.

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