



# Investigating the Level of Awareness and Preventive Behaviors Among Patients Hospitalized in Khorramshahr and Abadan Hospitals for Coronavirus Disease 2019

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## Abstract

**Background:** The spread of the coronavirus disease 2019 (COVID-19) pandemic is considered a global health crisis, and adherence to preventive behaviors by the general public is a principal way to break the chain of transmission and overcome this crisis.

**Objectives:** The presents study was conducted to investigate the level of awareness and preventive behaviors among patients hospitalized in Khorramshahr and Abadan hospitals for COVID-19.

**Methods:** In this cross-sectional descriptive study, 250 patients hospitalized in Abadan and Khorramshahr hospitals participated after providing informed consent. A self-administered awareness and preventive behaviors questionnaire was used as the data collection tool. Scores were categorized into three levels: Good (above 24), moderate (13 - 24), and poor (below 13). The reliability and validity of the questionnaire were also assessed. Data were analyzed using statistical tests through SPSS version 22.

**Results:** The results demonstrated that the participants' mean awareness score was  $34.00 \pm 3.81$ , and their mean preventive behavior score was  $27.41 \pm 9.15$ . The level of awareness and preventive behavior was significantly higher in participants from Khorramshahr Hospital than those from Abadan Hospital. Regarding education level, individuals with university degrees exhibited higher levels of preventive behaviors. Additionally, awareness scores decreased with decreasing age, while preventive behavior scores increased with increasing age ( $P < 0.001$ ).

**Conclusions:** The present study indicated that participating patients had favorable levels of awareness and preventive behaviors against COVID-19. Nevertheless, additional educational interventions and programs through media and social networks are still required.

**Keywords:** Awareness, Preventive Behaviors, Patients, Coronavirus Disease 2019

## 1. Background

Coronaviruses are large, complex, and diverse RNA viruses classified into four genera: Alpha, beta, delta, and gamma (1). Previously, six strains of coronaviruses were known to be pathogenic, with four of them, namely E229, OC43, NL63, and HKU1, commonly causing cold-like symptoms. Two other strains have caused severe respiratory illnesses, including severe acute respiratory syndrome (SARS) and Middle East

respiratory syndrome (MERS). In late December 2019, an outbreak of the coronavirus, initially named new coronavirus 2019 (nCoV-2019) but later renamed SARS-CoV-2, emerged in Wuhan, China (2). Within just a few months, it turned into a global pandemic.

Clinical symptoms of this disease include fever, which is the most common, and other symptoms, such as cough, fatigue, weakness, shortness of breath, and gastrointestinal symptoms. According to statistics, in

China, 18.5% of patients with coronavirus disease 2019 (COVID-19) progressed to a severe stage of the disease, characterized by acute respiratory distress syndrome (ARDS) symptoms, septic shock, metabolic acidosis, and bleeding disorders related to coagulation dysfunction (3). The mortality rate in China is 2.3%, which is lower than SARS (9.5%) and MERS (34.4%) (4).

Global concerns regarding the virus stem from its prevalence, associated complications, and high mortality rate (4). Elderly people and individuals with underlying diseases are at a higher risk of developing severe forms of the disease and are susceptible to serious complications, such as ARDS (5). Given the virus's high transmissibility and the lack of specific treatment, the most crucial and indeed the most principal strategy to control the disease is to break the chain of virus transmission (6). The COVID-19 can be transmitted through respiratory droplets produced when an infected person coughs or sneezes, then be inhaled by others, leading to transmission. Additionally, these droplets land on objects and surfaces around the infected individuals, and other individuals can subsequently get COVID-19 by touching the contaminated objects or surfaces and then touching their eyes, nose, or mouth. If a healthy person touches these contaminated surfaces and then touches their eyes, nose, or mouth, they can become infected. Given the way of transmission, the most crucial factor in breaking the chain of virus transmission is the preventive behaviors adopted by the general public to avoid contracting and spreading the virus (7) so that the World Health Organization (WHO) has called for a collective effort to prevent the transmission of this virus. Many countries have implemented measures such as suspending public transportation, closing public spaces, monitoring patients and carriers, and recommending stay-at-home orders to control the spread of this disease. Public awareness of how to manage respiratory diseases plays a crucial role in limiting their spread, particularly in middle- and low-income countries where healthcare systems, at best, have moderate capacities (8). In line with global warnings to break the chain of transmission, the Iranian government also implemented various communication-limiting behaviors, such as quarantining cities and closing public places. Simultaneously, through national media and social networks, it informed the public about various methods of preventing infection, such as wearing masks, washing hands, staying at home except in emergencies, and recognizing the symptoms of the disease (9,10).

Following China, Iran was one of the first countries to experience an outbreak of COVID-19. On February 19, 2020, the Iranian Ministry of Health, Treatment, and Medical Education announced the first confirmed case. The spread of the disease was so rapid that approximately one hundred days after the confirmation of the first case, the total number of confirmed cases exceeded 220,000, and the number of fatalities surpassed 50,000 (6). Statistics show that since the onset of the outbreak in Iran in February 2020, more than a thousand cases have been confirmed and over 50,000 deaths have occurred. It is estimated that developing a vaccine will take months, and therefore, crisis management depends on adherence to recommended measures by the public and healthcare workers. These measures are largely influenced by public knowledge, attitudes, and behaviors (11). Studies conducted during past pandemics, such as influenza and SARS, have shown that factors such as perceived risk of the disease, severity of transmission, mortality rate, and experienced stress from the disease have played a significant role in shaping the preventive behaviors of the general public (12, 13). In line with these findings, Nasirzadeh's study revealed that citizens of the city of Qom exhibited a high level of knowledge and preventive behaviors regarding COVID-19 (14). Furthermore, Nakhilzadeh's study demonstrated that the level of performance regarding preventive behaviors among the adult population in Iran, such as maintaining social distancing, wearing masks, and staying at home except for emergencies, was lower than other preventive behaviors (6). Akalu et al.'s study found that chronic patients hospitalized in Ethiopian hospitals had poor knowledge and performance regarding COVID-19 preventive behaviors (15). In contrast, Anikwe et al.'s study revealed that pregnant women attending hospitals in Nigeria had a high level of knowledge and performance regarding preventive behaviors (16).

## 2. Objectives

Given the importance of adhering to preventive behaviors in controlling this disease, the present study was conducted to determine the level of awareness and preventive behaviors regarding COVID-19 among hospitalized patients and their companions in Abadan and Khorramshahr hospitals.

## 3. Methods

The present study is a cross-sectional descriptive study. The statistical population consisted of all patients who were not diagnosed with COVID-19 and were hospitalized in Abadan and Khorramshahr hospitals. In

this study, 250 patients were purposefully selected and examined with informed consent and reading and writing literacy, and without any psychological disorders.

The data collection tool in this study was a researcher-made questionnaire developed based on common and reliable information from the Ministry of Health and a review of relevant articles under the supervision of an infectious disease specialist. The content validity was used to ensure the questionnaire's validity. To achieve this aim, the questionnaire's questions were provided to ten faculty members of School of Nursing, Abadan University of Medical Sciences, were evaluated in terms of content and were implemented after making recommended revisions. In order to ensure reliability, internal consistency was assessed by calculating Cronbach's alpha. To achieve this aim, the questionnaire was initially provided to 20 inpatients, and after excluding these individuals from the study and obtaining a Cronbach's alpha of 0.87, the researcher completed the questionnaires in person through interviews with the participating samples. This questionnaire encompasses 35 four-option questions. A score of 1 is assigned to the correct answer, and 0 for the incorrect answer. The total score for this questionnaire is 35, and the scores are categorized into three levels: Good (above 24), moderate (13 - 24), and poor (below 13).

It is noteworthy that no information about the participants was recorded in the questionnaires. The questionnaire consisted of three sections. The first section included participant demographic information (age, education level, marital status, and place of residence). The second section comprised 20 questions to assess participant's level of awareness about COVID-19. In this section, based on the information and recommendations of the WHO regarding this virus, participants responded to questions about transmission, symptoms, prognosis, treatment, and mortality rate. The third section comprised 15 questions about preventive behaviors related to the disease.

Following the approval of the research proposal by the Research Council of Abadan University of Medical Sciences and its subsequent endorsement by the university's ethics committee (IR.ABADANUMS.REC.1399), in order to observe ethical considerations and to collect the data, the researcher initiated the research within 3 months after securing the necessary permissions and coordination from the Research Deputy of Abadan University of Medical Sciences and the managers of Taleghani and Khorramshahr hospitals in Abadan and obtaining informed written consent from all participants. The

collected data were analyzed using SPSS version 22 and descriptive statistics. The Kolmogorov-Smirnov test confirmed that the data were normally distributed. For qualitative data assessment, frequency and percentage were used, while for quantitative data, mean and standard deviation, along with median, were employed. Pearson's correlation coefficient and analysis of variance (ANOVA) were used to examine the relationship between variables.

#### 4. Results

A total of 250 participants (mean age =  $34.13 \pm 7.59$  years) were included in this study. The majority of participants were male ( $n = 155$ , 62%). The education level of 93 participants (37.2%) was a bachelor's degree. Additionally, 126 participants (50.4%) resided in Abadan, and 42 participants (16.8%) reported a previous history of COVID-19 infection. In this study, the mean levels of awareness and preventive behaviors among participants were  $34.00 \pm 3.81$  and  $27.4 \pm 9.15$  (Table 1).

Table 1 revealed that the level of awareness and preventive behaviors of participating patients from Khorramshahr Hospital was significantly higher than that of Abadan Hospital. Regarding education level, it was found that individuals with university degrees performed better in preventive behaviors. Notably, individuals with an under-diploma education level demonstrated a higher level of awareness. Furthermore, it was observed that awareness decreased with decreasing age, while the scores of preventive behaviors increased with increasing age.

#### 5. Discussion

The COVID-19 infection is a public health issue, and adequate awareness among the public is essential for its management. This study revealed that the mean level of awareness and adherence to preventive behaviors among patients was satisfactory. This finding aligns with Anikwe's study on 430 pregnant women attending the hospital, demonstrating their good level of knowledge and performance regarding preventive behaviors (16). It is noteworthy that patients supported government policies and contributed to reducing the prevalence of the viral disease by adhering to health protocols and movement restrictions. These findings are encouraging and represent a positive behavior in the global fight to halter COVID-19. However, in Akalu's study on 404 patients with chronic diseases hospitalized in Ethiopian hospitals, participants demonstrated a significantly low level of knowledge and performance. Certain crucial preventive measures, such as physical distancing and avoiding crowds, were

**Table 1.** Participants' Demographic Characteristics <sup>a, b</sup>

| Variables                             | Values     | Awareness        |          | Preventive Behaviors |          |
|---------------------------------------|------------|------------------|----------|----------------------|----------|
|                                       |            | Mean $\pm$ SD    | P-Value  | Mean $\pm$ SD        | P-Value  |
| <b>Education level</b>                |            |                  | < 0.0001 |                      | < 0.0001 |
| University                            | 105 (42)   | 32.95 $\pm$ 3.04 |          | 26.91 $\pm$ 10.56    |          |
| Diploma                               | 89 (35.6)  | 34.76 $\pm$ 4.72 |          | 26.46 $\pm$ 8.01     |          |
| Under diploma                         | 56 (22.4)  | 35.00 $\pm$ 2.79 |          | 28.72 $\pm$ 1.56     |          |
| <b>Underlying disease</b>             |            |                  | < 0.0001 |                      | < 0.0001 |
| Healthy                               | 188 (75.2) | 33.60 $\pm$ 3.55 |          | 27.05 $\pm$ 9.22     |          |
| Hypertension                          | 13 (5.2)   | 27.69 $\pm$ 2.59 |          | 28.50 $\pm$ 2.07     |          |
| Heart disease                         | 7 (2.8)    | 38.00 $\pm$ 0    |          | 29.75 $\pm$ 0        |          |
| Respiratory disease                   | 12 (4.8)   | 35.00 $\pm$ 0.52 |          | 33.03 $\pm$ 1.56     |          |
| Diabetes                              | 24 (9.6)   | 36.25 $\pm$ 2.32 |          | 27.01 $\pm$ 9.91     |          |
| Other                                 | 6 (2.4)    | 41.00 $\pm$ 0    |          | 28.43 $\pm$ 0        |          |
| <b>Information source</b>             |            |                  | < 0.0001 |                      | < 0.0001 |
| Television                            | 57 (22.8)  | 34.56 $\pm$ 4.52 |          | 28.66 $\pm$ 7.66     |          |
| Internet                              | 48 (19.2)  | 62.34 $\pm$ 2.67 |          | 27.17 $\pm$ 6.86     |          |
| Social network                        | 65 (26)    | 32.75 $\pm$ 4.03 |          | 23.67 $\pm$ 10.71    |          |
| Ministry of Health                    | 32 (12.8)  | 35.33 $\pm$ 3.33 |          | 28.88 $\pm$ 7.87     |          |
| Other                                 | 48 (19.2)  | 34.81 $\pm$ 3.17 |          | 28.17 $\pm$ 6.17     |          |
| <b>History of disease</b>             |            |                  | 0.805    |                      | 0.340    |
| Yes                                   | 2 (4)      | 33.40 $\pm$ 3.76 |          | 27.64 $\pm$ 8.35     |          |
| No                                    | 48 (95)    | 34.12 $\pm$ 3.81 |          | 27.37 $\pm$ 9.32     |          |
| <b>Gender</b>                         |            |                  | 0.536    |                      | 0.187    |
| Male                                  | 155 (62)   | 33.97 $\pm$ 3.85 |          | 27.05 $\pm$ 9.48     |          |
| Female                                | 95 (38)    | 34.05 $\pm$ 3.75 |          | 28.00 $\pm$ 8.46     |          |
| <b>Income</b>                         |            |                  | < 0.0001 |                      | < 0.0001 |
| Excellent                             | 18 (7.2)   | 34.33 $\pm$ 3.18 |          | 29.75 $\pm$ 3.81     |          |
| Moderate                              | 156 (63.2) | 32.82 $\pm$ 4.36 |          | 27.76 $\pm$ 8.93     |          |
| Poor                                  | 74 (29.6)  | 34.2 $\pm$ 1.34  |          | 26.68 $\pm$ 6.88     |          |
| <b>Place of residence</b>             |            |                  | < 0.0001 |                      | < 0.0001 |
| Abadan                                | 126 (50.4) | 33.13 $\pm$ 4.38 |          | 26.73 $\pm$ 9.08     |          |
| Khorramshahr                          | 124 (6.49) | 34.88 $\pm$ 2.88 |          | 28.11 $\pm$ 8.97     |          |
| <b>Age (mean <math>\pm</math> SD)</b> |            | 34.13 $\pm$ 7.59 | < 0.0001 | -                    | < 0.0001 |

<sup>a</sup> Values are expressed as No. (%), unless otherwise indicated.<sup>b</sup> P-value using the t-test and analysis of variance.

found to be particularly challenging for this population. Low educational status, rural residence, and low monthly income were significantly associated with poor knowledge and performance (15). The results of Kebede's study on 247 patients visiting the hospital also revealed that the level of knowledge among these individuals was insufficient during the pandemic, highlighting the crucial role of media and government in promoting and disseminating information about disease way of transmission (17). Fisher's study on 3345 kidney disease patients with COVID-19 found that the risk of death was associated with male gender and age over 50,

emphasizing the importance of increasing awareness and preventive behaviors in these patients (18).

It was found in the present study that individuals with university degrees had higher levels of performance regarding preventive behaviors. The level of awareness decreased with decreasing age, while preventive behaviors increased with increasing age. No significant correlation was found with gender. Along the same line, previous research has indicated that performance regarding preventive behaviors improves with age, which may be attributed to increased health consciousness among older individuals. A similar result was observed in Lau et al.'s study (19). However, in

Akalu's study, where most participants were illiterate, it was observed that increasing age was associated with low awareness and poor performance (15). Some studies have also shown that women performed better than men and adopted most preventive behaviors against COVID-19, a finding also reported in other studies, such as studies conducted by Park et al. (20) and Najimi and Golshiri (21); however, the reason may be attributed to women's greater responsibilities for their own and their families' health, which is not consistent with the findings of the present study.

### 5.1. Conclusions

The results of the present study revealed that hospitalized patients performed favorably in terms of the level of awareness and preventive behaviors. Moreover, demographic variables, such as place of residence, income, and education level, significantly impacted these results. Limitations of this study include the lack of similar studies at the provincial level and the limited cooperation of patients.

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### Footnotes

**Authors' Contribution:** All authors contributed to the conception and initial design of the study, data collection, questionnaire completion, data analysis and interpretation, initial manuscript drafting, and review and approval of the final version of the manuscript. All authors are accountable for the content of the work.

**Conflict of Interests:** The authors declare no conflict of interests.

**Data Reproducibility:** The dataset presented in the study is available on request from the corresponding author during submission or after its publication. The data are not publicly available due to privacy.

**Ethical Approval:** The present study was approved by the Ethics Committee of Abadan University of Medical Sciences (IR.ABADANUMS.REC.1399.109).

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**Informed Consent:** Written informed consent was obtained from all participants.

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