

Research Article

Knowledge, Attitude, and Practice toward Prevention of COVID-19 Among Nursing and Midwifery Students: A cross-sectional Study in Gorgan, Northern Iran

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Abstract

Background: Healthcare providers are high-risk groups for the novel coronavirus disease (COVID-19) infection. Nursing students are an essential part of high-risk healthcare providers. The aim of this study was to evaluate the knowledge, attitude, and practice of nursing and midwifery students at Golestan University of Medical Sciences (GOUMS) toward the prevention of COVID-19.

Methods: This cross-sectional study was conducted on 174 nursing and midwifery students of GOUMS (northeast of IRAN) in 2020. Data were gathered using an online questionnaire comprising three parts – Knowledge (8 questions), Attitude (10 questions), and Practice (8 questions) toward the prevention of COVID-19. The range of scores in each subscale (knowledge, attitude, and preventive practices) were 8–24, 10–50, and 8–24, respectively. Data were analyzed using the SPSS v.16 software. The Mann–Whitney and Kruskal–Wallis tests were used for the analysis.

Results: Overall, in this study, nursing and midwifery students had a good knowledge (mean score: 23.19 ± 2.56), a positive attitude (mean score: 45.48 ± 4.21), and appropriate practice (mean score: 23.30 ± 3.51) regarding COVID-19 prevention. Also, the results revealed a positive correlation between knowledge and attitude ($r = 0.1, P = 0.18$) and attitude and practice ($r = 0.2, P = 0.01$) among the students.

Conclusion: The findings demonstrated a good preventive knowledge, attitude, and practice toward COVID-19 among nursing and midwifery students.

Keywords: health knowledge, attitudes, practice, COVID-19, students, nursing, Iran

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1. Introduction

The novel coronavirus disease (COVID-19) belongs to the Betacoronas family, which was first reported in Wuhan, China in 2019. COVID-19 is very contagious and, similar to its other siblings, can produce a wide spectrum of symptoms such as common cold or severe respiratory problems in MERS-COV or SARS-COV [1]. The COVID-19 virus had a high transmissibility rate and global rapid spread in a short period of time [2]. On June 2nd, 2020, the World Health Organization (WHO) reported a total of 376,320 deaths due to COVID-19 [3].

These viruses are Zoonotic in origin with some types transferred from cats and camels. Although there are several types of viruses in this family, no human involvement is seen till now [4]. This virus, with its surface protein (S) can bind to the host receptor angiotensin converting enzyme 2 (ACE2) to enter the host cell. ACE2 is a peptidase and is attached to the cell membrane in several tissues throughout the body, including the heart, gastrointestinal tract, kidneys, and lungs [5–7]. The most common symptoms of COVID-19 infection are respiratory symptoms, fever, cough, dyspnea, malaise, and fatigue. In severe forms it can lead to pneumonia, acute respiratory distress syndrome (ARDS), renal failure, and also death [8–10]. Acute hemorrhagic encephalopathy and increasing risk of cerebrovascular accidents (CVA) have also been seen and reported [11, 12]. In previous studies in China, mortality was 0.9% in patients without underlying medical conditions. Patients with underlying cardiac disease, diabetes mellitus (DM), and hypertension (HTN) were at higher risk of mortality [13].

Standard recommendations for preventing the infection such as handwashing, wearing masks, and maintaining social distancing are vital. However, social media being the main source of news and information today, most people are also exposed to inaccurate and fake information online that can develop or amplify fear and anxiety among them [9, 14]. However, based on research evidence, patients felt most assured when healthcare providers were the source of information [2].

The knowledge, attitude, and practice of people plays a fundamental role in controlling a disease/pandemic [15]. Lack of information about can lead to an ultimate disaster [16]. For assurance of practical preventive actions and optimal readiness, providing adequate information, educational packages, and hygienic strategies to society is vital in controlling system [17]. Considering nursing students are at the forefront of the healthcare today, they must have adequate knowledge and training for the prevention and appropriate management of COVID-19. Therefore, of the present study aims to

evaluate the knowledge, attitude, and practice of Iranian nursing and midwifery students toward the prevention of COVID-19.

2. Materials and Methods

This cross-sectional study was conducted on nursing and midwifery students of the Golestan University of Medical Sciences (GOUMS, northeast IRAN) in 2020. Following the approval of the Institutional Ethics Committee and receiving written informed consent from all study participants, 174 eligible students were recruited in the using census method. The inclusion criteria were being a nursing or midwifery student and active employment during study period. Cases with incomplete questionnaire were excluded. Data were collected using demographic information form and a “knowledge, attitude, and practice for prevention of respiratory tract infections” questionnaire which was developed by Goni *et al.* in 2020. Based on the viewpoint of experts, the questionnaire scoring was revised. Relying on the insight gathered from the expert panel, responses to questions were changed in each domain and then a pilot study was performed on 20 students from the same study population. The result of Cronbach’s alpha (0.85) indicated that the research instrument was reliable [18]. This self-administered questionnaire consisted of three domains – knowledge (8 items), attitude (10 items), and practice (8 items).

The knowledge domain of questionnaire consisted of eight items to assess students’ knowledge about the etiology, virus dissemination and disease transmission, signs and symptoms, complications, risk factors, and some protective methods for preventing of disease. Scoring ranged from 1 to 3 for wrong answers, don’t know, and correct answers, respectively. The total score in this part ranged from 8 to 24.

The second domain of the checklist evaluated students’ attitude toward the prevention of infection. This checklist had 10 questions which were scored on a five-point scale (1 = never; 2 = rarely; 3 = sometimes; 4 = often; 5 = always) and the total score in this part ranged from 10 to 50.

The third domain comprised eight questions which were scored on a three-point scale (always = 3, occasional = 2, never = 1), the maximum score was 24 and the minimum was 8.

For data collection, first an electronic questionnaire was designed on a virtual e-learning system. An online questionnaire link was sent to the students. Data were analyzed using the SPSS v.16 software (SPSS Inc., Chicago, IL, USA). Kolmogorov–Smirnov test was used to examine the normality of the variables, which showed a non-normal

distribution. Mann–Whitney test and Kruskal–Wallis test were used to determine the relationship between demographic information with knowledge, attitude, and practice of students. Also, Spearman’s correlation test was used to measure weather and how much the variables are correlated [18].

3. Results

The mean age of the students was 21.97 ± 2.72 years (range, 18–38). Most students were nursing students (86.8%), single (89.1%), female (60.9%), and living in the city (83.3%). The biggest source of information was virtual information (35.1%). Only 4.6% of students were infected with COVID-19 before study, and 9.2% had family members infected with COVID-19. The underlying diseases were present in 17.2% of students and 31.6% of students had history of influenza vaccination before the study (Table 1).

The mean and standard deviation of scores of three domains were 23.19 ± 2.56 , 45.48 ± 4.21 , and 23.30 ± 3.51 , respectively.

There was no significant correlation between the mean scores of knowledge with demographic characteristics, source of information, and history of participants’ infection by COVID-19 and history of their family members’ infection and gaining awareness about the disease (Table 2).

The results of this study showed that the mean scores of attitude had no correlation with the knowledge, demographic characteristics, source of information, and COVID-19 infection in students or their family (Table 2).

The mean practice scores in students had a significant correlation with gender, marital status, and history of previous infection with COVID-19 in students and their family members (Table 2).

Moreover, the results showed no significant correlation between knowledge and attitude ($r = 0.1$, $P = 0.18$). There was an inverse correlation between students’ knowledge and practice, however, this correlation was not statistically significant ($r = -0.05$, $P = 0.51$). Nevertheless, there was a positive correlation between students’ attitude and practice ($r = 0.2$, $P = 0.01$).

4. Discussion

This study showed that nursing and midwifery students had a good and appropriate level of knowledge, attitude, and practice towards the prevention of COVID-19. The

TABLE 1: Frequency distribution of demographic and clinical characteristics of students.

| Percentage | Frequency | Variable | |
|------------|-----------|---------------------------|--|
| 39.1 | 68 | Male | Gender |
| 60.9 | 106 | Female | |
| 89.1 | 155 | Single | Marital status |
| 10.9 | 19 | Married | |
| 83.3 | 145 | City | Place of residence |
| 15.5 | 27 | Village | |
| 86.8 | 151 | Nursing | Field of study |
| 13.2 | 23 | Midwifery | |
| 9.2 | 16 | TV | Information source |
| 35.1 | 61 | Social media network | |
| 2.3 | 4 | Educational sources | |
| 6 | 1 | Public information | |
| 47.7 | 83 | More than one sources | |
| 5/2 | 9 | Others | |
| 95.4 | 166 | No | History of COVID-19 infection |
| 4.6 | 8 | Yes | |
| 1.7 | 3 | DM | Comorbid diseases |
| 0.6 | 1 | Cardiac disease | |
| 3.4 | 6 | HTN | |
| 1.7 | 3 | Immune deficiency disease | |
| 0.6 | 1 | COPD | |
| 8 | 14 | Asthma | |
| 0.6 | 1 | Allergic rhinitis | |
| 82.8 | 144 | None | |
| 90.8 | 158 | No | History of COVID-19 infection in family members |
| 9.2 | 16 | Yes | |
| 68.4 | 119 | No | Influenza vaccination |
| 31.6 | 55 | Yes | |

results of a study on Palestinian nursing students revealed that they had a negative attitude and moderate level of knowledge about COVID-19 [19]. The results of another study indicated a high level of knowledge about COVID-19 among Philippine nursing students. Higher year level of students had significant correlation with their knowledge. In addition, female students had a higher attitude score than their male counterparts [20]. Another study in Vietnam revealed a good preventive practice toward COVID-19

TABLE 2: The knowledge, attitude and practice for prevention of COVID-19 disease among students based on demographic and clinical characteristics.

| Practice | | Attitude | | Knowledge | | Variable | |
|--------------|--------------|------------|--------------|-----------|--------------|------------------------|--|
| P-value | Mean ± SD | P-value | Mean ± SD | P-value | Mean ± SD | | |
| 0.04 | 22.26 ± 4.15 | 0.85 | 45.94 ± 4.42 | 0.33 | 23.40 ± 2.58 | Male | Gender |
| | 23.63 ± 3.30 | | 46.00 ± 4.10 | | 23.06 ± 2.55 | Female | |
| 0.003 | 23.40 ± 3.50 | 0.505 | 46.02 ± 4.34 | 0.93 | 23.17 ± 2.50 | Single | Marital status |
| | 20.57 ± 3.80 | | 45.63 ± 3.04 | | 23.36 ± 2.29 | Married | |
| 0.088 | 23.32 ± 3.68 | 0.3 | 46.04 ± 4.20 | 0.6 | 23.21 ± 2.56 | City | Place of residence |
| | 21.92 ± 3.8 | | 45.41 ± 3.97 | | 22.93 ± 2.63 | Village | |
| 0.078 | 22.90 ± 3.79 | 0.88 | 46.00 ± 4.26 | 0.37 | 23.28 ± 2.50 | Nursing | Field of study |
| | 23.34 ± 2.83 | | 45.86 ± 3.95 | | 22.60 ± 2.92 | Midwifery | |
| 0.622 | 23.40 ± 2.26 | 0.503 | 4.23 ± 2.26 | 0.577 | 24.00 ± 1.37 | TV | Information source |
| | 22.56 ± 3.74 | | 45.13 ± 3.76 | | 22.93 ± 2.74 | Social media network | |
| | 23.16 ± 3.55 | | 45.47 ± 4.62 | | 22.50 ± 2.52 | Educational sources | |
| | 23.75 ± 2.36 | | 45.25 ± 7.23 | | 23.00 ± 00 | Public information | |
| | 15.00 ± 00 | | 44.00 ± 00 | | 23.13 ± 2.59 | More than one sources | |
| | 23.27 ± 3.72 | | 46.86 ± 3.77 | | 24.00 ± 2.59 | Others | |
| 0.147 | 21.66 ± 4.09 | 0.81 | 43.33 ± 3.53 | 0.346 | 23.24 ± 2.52 | Yes | History of COVID-19 infection |
| | 23.19 ± 3.65 | | 45.99 ± 4.25 | | 22.00 ± 3.16 | No | |
| | 21.12 ± 4.58 | 0.477 | 45.75 ± 3.53 | 0.125 | 22.33 ± 3.05 | DM | Comorbid diseases |
| 0.024 | 21.00 ± 2.64 | | 44.66 ± 3.05 | | 23.00 ± 00 | Cardiac disease | |
| | 23.00 ± 00 | 44.00 ± 00 | 23.83 ± 2.04 | HTN | | | |
| | 23.83 ± 3.25 | | 44.50 ± 3.88 | | 23.33 ± 1.15 | Impaired immune system | |
| | 23.66 ± 2.30 | | 47.33 ± 5.03 | | 23.00 ± 00 | COPD | |
| | 23.00 ± 00 | | 45.00 ± 00 | | 23.21 ± 2.63 | Asthma | |
| | 20.00 ± 2.03 | | 46.14 ± 3.73 | | 17.00 ± 00 | Allergic rhinitis | |
| | 16.00 ± 00 | | 38.00 ± 00 | | 17.00 ± 00 | Nothing | |
| 0.009 | 23.36 ± 3.72 | 0.784 | 46.06 ± 4.26 | 0.121 | 23.11 ± 2.54 | Yes | History of COVID-19 infection in family members |
| | 23.32 ± 3.6 | | 45.91 ± 4.26 | | 23.94 ± 2.77 | No | |
| 0.519 | 20.87 ± 3.24 | 0.75 | 46.63 ± 3.84 | 0.819 | 23.21 ± 2.51 | Yes | Influenza vaccination |
| | 23.20 ± 3.62 | | 45.87 ± 4.27 | | 23.14 ± 2.68 | No | |

among healthcare students; however, sufficient knowledge and positive attitude were lower [21].

Goni *et al.*'s study in Malaysia revealed an appropriate and good level of knowledge for the prevention of influenza among Haj pilgrims [16]. However, other studies on Haj pilgrims showed low level of knowledge in this regard [22, 23]. In the present

study, participants had an excellent and appropriate level of knowledge. This difference could be due to the students' level of education. No significant correlation was seen between demographic variables and students' level of knowledge. Other studies did not confirm any correlation between demographic characteristics and participants' level of knowledge regarding viral infection prevention [24, 25]. This difference in correlation could be due to the study population and the difference in their cultures, age, and educational backgrounds.

In this study, the mean score in attitude toward coronavirus prevention was high. Previous studies revealed that participants had a positive attitude in observing preventive recommendations for MERS-CoV [26, 27]. The practice score in the prevention of COVID-19 had a significant correlation with the gender of participants. Females had more attention to prevention. Another factor which had a significant correlation was the history of comorbid diseases. One possible explanation for this is adequate education and knowledge of these participants and the high possibility of being infected by COVID-19 in patients with underlying disease, which is associated with higher knowledge and attitude [28]. History of previous infection of person or their family members with COVID-19 had a significant correlation with their preventive practice score. This could be due to students' previous personal experiences which can lead to better practice in this regard.

The results revealed a positive correlation between knowledge and attitude and attitude and practice among students. In an Indonesian study by Adli *et al.*, the level of knowledge of undergraduate medical students related to the COVID-19 pandemic was slightly positively correlated with their attitude and practice, while attitude was weakly correlated with their practice [29]. Another study in Ethiopia indicated a negative correlation between knowledge and attitude and between knowledge and practice regarding COVID-19 among healthcare workers [30].

5. Limitations

The present study has some limitations. Because of the COVID-19 pandemic, the students were mostly taking online classes through virtual and e-learning methods, resulting in limited access and interaction. The lack of generalizability of the findings to all nursing and midwifery student in different geo-cultural contexts, due to small sample size and participants' sociodemographic and cultural characteristics, is another limitations of this study..

6. Conclusion

The results of this study demonstrated a good preventive knowledge, attitude, and practice toward COVID-19 among nursing and midwifery students. However, additional education and training strategies are needed to offer a better understanding and motivate positive attitude and practice toward COVID-19 prevention for all nursing and midwifery students.

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Ethical Considerations

This study was approved by institutional ethical research committee at Golestan University of Medical Science (Code: IR.GOUMS.REC.1399.006). All participants gave a written informed consent before filling in the questionnaire. Confidentiality of private information and voluntary participation was ensured.

Competing Interests

The authors have no conflicts of interest to declare for this study.

Availability of Data and Material

All relevant data of this study are available to any interested researchers upon reasonable request to the corresponding author.

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