Evaluation of Knowledge, Practices, Attitude, and Anxiety of Nurses towards COVID-19 during the Current Outbreak in Karachi, Pakistan

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Abstract

Background: Since the emergence of the novel coronavirus, the front line soldiers during this pandemic are the healthcare professionals because of their direct association with COVID19 patients. In the management of such patients, nurses play a significant role through proper care and preventive measures. Due to its contagious nature, fatality, and no proper medicine, it is a risk to the health and life of nurses and has an impact on their psychological health. The aim of the current study was to assess the knowledge, attitude, practices, and anxiety levels of the frontline nurses.

Methods: It was an online questionnaire-based cross-sectional survey targeting only those nurses involved in the management of COVID-19 patients from different hospitals of Karachi, Pakistan. SPSS 21 was used for data analysis. Descriptive analysis, Chi-Square, and t-tests were applied. P-value <0.05 was considered significant.

Results: Data of 78 nurses were analyzed. We observed that nurses possess good knowledge about COVID-19, its sources, symptoms, and routes of transmission of the Virus, etc. The knowledge mean score was calculated at 14.67 ± 3.36. Health Department /Hospital and social media are the main sources of information regarding COVID-19. We investigated that 92.3% of the nurses had mild to severe anxiety and anxiety levels are significantly higher among females (P<0.05).

Conclusion: We concluded that the nurses performing their duties with COVID-19 positive patients have good knowledge and attitude. But their anxiety levels are high. Psychological interventions along with training should be given.

Keywords: Perceptions; infectious disease; pandemic; healthcare workers

Introduction

Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is the latest member of the Corona Virus family (1) and has been declared a pandemic by World Health Organization (WHO) on 11th March 2020 as the virus was reported to be highly contagious and deadly (2). Based on the current data, the total number of reported cases of coronavirus disease (COVID-19) are more than 20 million and over
60000 have died while the figure is raising exponentially (3). In Pakistan, the first case of the virus was reported on 26th Feb 2020, a university student travelled from Iran, which was the hub of this virus after China (4). By this time (31st May 2020) Pakistan has crossed the 70000 confirmed reported cases and with more than 1400 deaths so far (3).

To control the spread, the Centers for Disease Control and Prevention (CDC) has recommended a guideline and a protocol to follow (5). Mainly this virus spreads via aerosols, direct contact with the infected person or indirectly by touching a surface that has a virus on it. Fever, sore throat, dry cough, and shortness of breath are the main symptoms (6). Up till now, there is no specific treatment other than supportive treatment and its morbidity rates are less than 5% (7, 8). The nature of this virus is rapidly changing and new information regarding 2019-nCoV is pouring daily. So updated knowledge and trainings are very necessary to tackle this deadly virus (6).

Healthcare professionals (HCPs) are the front line soldiers in the outbreak of any disease and are more susceptible to be infected because of their direct and close interaction with the diseased individuals (9, 10). They may not only be infected but in severe cases, it may lead to the death of the HCPs, or a similar scenario may happen with their family members or closed ones (11). In the current pandemic, thousands of healthcare professionals and healthcare workers were infected in China, Spain, Italy, France, Turkey, and other parts of the world (12-14). International Council of Nursing (ICN) stated that over 90000 healthcare workers have been infected with COVID-19 and only the death toll of nurses is estimated to be 360 (15, 16). In Pakistan, hundreds of HCPs are reported COVID-19 positive along with many deaths (17, 18). Moreover, a suicide case of 27 years old doctor has also been reported in the turmoil of COVID-19 due to anxiety (19).

The current situation is a challenge for HCPs to cope up with anxiety, stress, and depression, not only for their health and life but for the safety of their family members. In such conditions, it is quite normal HCPs to develop psychological, mental or other health-related problems (20). Health care workers involved with the testing and treatment of individuals with COVID-19 are more vulnerable than the general public as well as more prone to spread the infection to their loved ones and this may also result in psychological distress (21, 22). Furthermore, during the episodes of Severe acute respiratory syndrome (SARS) and Middle East Respiratory Syndrome (MERS) multiple cases of panic attacks, anxiety, stress even suicides have been reported (23-26).

The transmission of the disease among the HCP is linked with improper training, not following the recommended protocols or guidelines, absence of isolation rooms, and also the lack of knowledge and awareness regarding the course and spread of the disease (27). It is well documented that proper knowledge of the disease may have a positive impact on the attitude and practices thus fewer chances of infection (28).

Nursing is the largest healthcare profession in the world, with approximately 20 million nurses worldwide (29). Along with the other HCPs nurses play a pivotal role in healthcare setup in prevention, infection control, isolation, continuous monitoring of the patients and because of their unique patient-facing nature, there are occupational risks to providing care during the COVID-19 outbreak (30) and it is also reported that the chances of occupational exposure are relatively higher in nurses (31). Moreover, previous studies have shown that higher levels of anxiety and depression among the nurses due to their long interaction with the patients and the nature of their job (32-34).

The current study aimed to assess the knowledge, practices, attitude, and anxiety levels toward COVID-19 among nurses of Karachi, Pakistan who were directly involved with COVID-19 patients.

Methodology

**Study Design:** It is an online survey-based cross-sectional study conducted in May 2020 during the period of strict lockdown.

**Sampling:** Rao soft was used to determine the sample size. The minimum required sample size was 67 considering a response rate of 50%, 90% confidence interval (CI), and a 10% margin of error. A supplementary 20% (n=13) was added to overcome any flaws or discrepancies in the filling up of the survey form. So the final sample size was considered 80.

**Study Population:** Participants of the current study were the frontline nurses deputed in the management of COVID-19 in different hospitals and isolation centers of Karachi, Pakistan.

A validated questionnaire, previously used in Iran with a few modifications, was used for the current analysis (35).
**Ethics**: Ethical approval was obtained from the ethics and review committee of Altamash Institute of Dental Medicine, Karachi, Pakistan (AIDM/EC/04/2020/03).

**Statistical Analysis**: For data analysis SPSS V.21 for analysis. To check the significance of demographic characteristics Chi-square test was used. Independent sample t-test was performed to access any difference in mean anxiety score among genders. Differences in mean anxiety scores among different age groups and educational levels were accessed by one-way ANOVA. A p-value of less than 0.05 considered as significant in all tests.

**Results**

Total 85 forms were submitted and due to incomplete submissions and errors, we excluded 7 forms so the data of 78 nurses were analyzed.

No significant difference among the gender was found. Majority of the participants were in the age group of 18-30 years, had a bachelor’s degree with at least 6 to 15 years of experience and. A statistically significant difference in age, education, and the experience was found. (Table1)

In the current study, we explored that 12 (15.38%) of nurses reported that they were infected with SARS-CoV-2 (P>0.05) and 56(71.79%) of the participants claimed that their colleagues have been infected with the virus (P<0.05). A family member of 14 (17.94%) of the participants found positive for COVID-19 (P=0.05).

The bulk of the participants were aware of the symptoms, treatment options, routes of transmission, and risk factors for COVID-19. A substantial number of participants answered correctly (Table 2). The knowledge score ranged from 5 to 19 and the mean knowledge score of nurses was 14.67 ± 3.36 (P<0.05). All participants knew that COVID19 is a viral disease and it is contagious. A considerable number of the participants answered correctly (Table 2) Three main symptoms of COVID-19 i.e. fever, shortness of breath, and dry cough was mentioned by 98.71, 98.71, and 91.02% of the nurses respectively. (Table 2)

We analyzed that a significant number of nurses have anxiety (p<0.001). Nurses having no or mild anxiety are 6 (7.7%) and 6 (7.7%) respectively and those having moderate, high and very high levels of anxiety are 19 (24.4%), 24 (30.8%) and 23 (29.5%) respectively (FIG 1).

A significant difference in the levels of anxiety was observed among the genders (p=0.016). Females are more anxious as compared to males (FIG 1). In the range of 1-5, where 1 means no anxiety and 5 means very severe anxiety, we calculated that the mean anxiety score to be infected for participants was 3.60 ± 1.25 and for their family, the mean anxiety level was recorded 3.85 ± 1.31. Anxiety about performing measures like aerosol producing procedures, taking a nasopharyngeal swab, nebulizing, suctioning, etc. was calculated 3.30 ±1.33 (Fig 3). We evaluated that the anxiety levels are significantly higher among those individuals who have been previously infected with COVID-19 (P=0.013).

As per our results, around 80% of the nurses put face masks, protective clothing, placed suspected patients in a ventilated single room, routinely clean and disinfect environmental surface, frequent hand cleaning and follow respiratory hygiene and cough etiquette and practice social distancing. (Table 3).

Current study findings demonstrate a positive attitude of the nurses towards COVID-19. We found that 75(96%) nurses who have dedicated themselves to COVID-19 patients willing to continue their work. A large number of nurses 72 (92.3%) want more people to be trained to fight with COVID-19 and 59(75.6%) of the nurses rejected the idea of having attendants with the patients in the hospital (Table 3).

### Table 1: Demographic Characteristics of the Participants

| Variable          | Number (%) | P value |
|-------------------|------------|---------|
| **Gender**        |            |         |
| Male              | 40 (51.3)  | 0.821   |
| Female            | 38 (48.7)  |         |
| **Age**           |            | <0.001  |
| 18-30             | 37 (47.4)  |         |
| 31-40             | 34 (43.6)  |         |
| 41-50             | 5 (6.4)    |         |
| 51-60             | 2 (2.6)    |         |
| **Educational Level** |          | <0.001  |
| High School       | 6 (7.7)    |         |
| Diploma In Nursing| 31 (39.7)  |         |
| Bachelor degree in Nursing | 33 (42.3) |         |
| Master degree In Nursing | 8 (10.3) |         |
| **Work Experience** |          | 0.013   |
| 0-5 years         | 30 (38.46) |         |
| Have you been COVID-19 Positive | Yes | NO |
|--------------------------------|-----|----|
| 16 and More                    | 12  | 66 | 15.38% | 84.62% |
| 6-15                           | 34  | 14 | 43.58% | 17.9 |

**Table 2: Knowledge of the Participants**

| Questions                           | Options                        | Number (%) |
|-------------------------------------|--------------------------------|------------|
| COVID-19 Mortality Rate             | < 5%                           | 44 (56.41) |
|                                     | 10% - 20%                      | 19 (24.35) |
|                                     | 21% - 30%                      | 5 (6.41)   |
|                                     | > 30%                          | 10 (12.82) |
| Incubation Period                   | 2-14 days                      | 43 (55.12) |
|                                     | 2-7 days                       | 2 (2.56)   |
|                                     | 7-14 days                      | 30 (38.56) |
|                                     | 7-21 days                      | 3 (3.84)   |
| Symptoms of COVID-19                | Fever                          | 77 (98.71%)|
|                                     | Dry Cough                      | 71 (91.02%)|
|                                     | Runny Nose                     | 56 (71.79%)|
|                                     | Shortness of Breath            | 77 (98.71%)|
|                                     | Joint/Muscle ache              | 42 (53.84%)|
|                                     | Red Eyes                       | 35 (44.87%)|
|                                     | Headache                       | 42 (53.84%)|
|                                     | Diarrhea                       | 32 (41.02%)|
|                                     | Wet cough                      | 30 (38.46%)|
| COVID 19 is a Viral Disease         | 78 (100%)                      |
| COVID 19 is a Protozoal Disease     | 0 (0.0%)                       |
| COVID 19 is a Bacterial Disease     | 0 (0.0%)                       |
| COVID 19 is a Fungal Disease        | 0 (0.0%)                       |
| Route of Transmission              | Airborne                       | 62 (79.48%)|
|                                     | Direct Contact                 | 68 (87.17%)|
|                                     | Droplet                        | 70 (89.74%)|
|                                     | Indirect Contact               | 56 (71.79%)|
|                                     | Sexual Contacts                | 23 (29.48%)|
|                                     | Fecal-Oral Route               | 29 (37.17%)|
| Factors considered to identify patients at risk of having COVID-19 | Presence of symptoms of Respiratory Distress | 70 (89.74%) |
|                                     | Presence of symptoms of Gastroenteritis | 20 (25.64%) |
| What is the routine treatment of COVID 19? | No Treatment | 18 (23.07%) |
|                                     | Supportive Treatment           | 66 (84.61%)|
|                                     | Vaccine                        | 6 (7.69%)   |
|                                     | Not sure                       | 14 (8.97%)  |
|                                     | Other (Onion, Steam, Ablution) | 04 (5.12%)  |

**Table 3: Practices and Attitude of Nurses towards COVID-19**

| Item                                                                 | Response | Yes | No |
|----------------------------------------------------------------------|----------|-----|----|
| Put facemask on known or suspected patients                          |          | 75  | 3  |
| Place known or suspected patients in adequately ventilated single rooms |          | 68  | 10 |
| All health staff members wear protective clothing                     |          | 72  | 6  |
| Avoid moving and transporting patients out of their area unless necessary |          | 70  | 8  |
| Routinely clean and disinfect surfaces in contact with known or suspected patients | | 67  | 11 |
| Clean and disinfect environmental surfaces                             |          | 64  | 14 |
| Frequently clean hands by using alcohol-based hand rub or soap and water | | 69  | 9  |
| Safe injection practices (i.e., aseptic technique for parenteral medications) | | 47  | 31 |
| Respiratory hygiene / cough etiquette                                 |          | 64  | 14 |
| Practice social distancing                                            |          | 65  | 13 |
| Do you see the need for more people to be trained by the medical staff? |          | 72  | 6  |
| In a hospital do you prefer having more attendants with the patient?  |          | 18  | 59 |
| Do you want to continue work with COVID 19 patients?                  |          | 42  | 29 |
| If we get Proper Training and PPE                                     |          | 29  | 3  |
If we get a special allowance | Total 75

| No Anxiety | Mild | Moderate | Severe | Very Severe |
|------------|------|----------|--------|-------------|
| Males | 5 | 3 | 13 | 11 | 8 |
| Females | 1 | 3 | 6 | 13 | 15 |
| Total | 6 | 6 | 19 | 24 | 23 |

![Anxiety Levels Among the Participants](image)

**Figure 1:** No of males, females, and the total number of participants with no, mild, moderate, severe, and very severe anxiety.

![Mean Anxiety Scores](image)

**Figure 2:** Mean Anxiety Score (1 means no anxiety and 5 means very severe anxiety)

**Discussion**

To best of our knowledge, this is the first study that has targeted only the Nurses to assess their knowledge and practices towards COVID-19 and their level of anxiety in Pakistan. This study was being conducted when Pakistan crossed the mark of 70000 confirmed reported cases of COVID-19. We assessed their knowledge, attitude, and practice to shield them and prevent the further spread of the infection. It is reported that nurses are more prone to infection due to close contact with the patients (36). Moreover, we analyzed the anxiety levels among the nurses as studies suggest that in case of big disasters mental health issues may arise (37). The finding of the current study showed that nurses in Karachi have sufficient knowledge regarding different aspects of COVID-19. In a recent study conducted on health care professionals in Pakistan revealed that HCP has good knowledge of COVID-19 (38, 39). Moreover, different studies performed in different parts of the world showed strikingly similar results (35, 40, 41). Contradictory to the findings of our study, research conducted in Pakistan a few weeks before, reported a low level of knowledge among the nurses (42). The disparity in expertise, in our view, is due to the training sessions and awareness workshops carried out by the health departments and hospitals. Furthermore, awareness campaigns on social media and print media have bought change as well. Previous studies in different parts of the world during the epidemic revealed that the rate of influx of information is much high during the current pandemic due to stress and depth of the situation (43, 44).

We appraised that the Health department or hospitals and social media and are the two major sources of information regarding COVID-19. Our results are further endorsed by different studies stated that the previously mentioned sources are the primary sources of information regarding COVID-19 (39, 45, 46).

In this study, 57 (73.07%) participants have received formal training to cater to the COVID-19 positive patients and infection control. Contrary to our findings the previous study conducted in Pakistan showed that 50% of the nurses had not undergone any training and have limited knowledge about COVID-19 (42). Training may be the justification for increased awareness and knowledge amongst nurses, as is apparent in the current report. Zhong et al stated that with good knowledge and practice and following the protective measures, HCPs not only save themselves but show a good message of awareness to the community (47).

We investigated that 12 (15.38%) nurses were infected with COVID-19 and 56(71.79%) of the nurses have a colleague(s) that had been infected with the COVID
19. Moreover, 14(17.94%) nurses reported that their family member(s) had been infected. HCPs show a high prevalence of getting an infection with any contagious or non-contagious infection (48). Furthermore, data from other countries are in accordance with our findings (49) In Italy 12% of the nurses got COVID-19. In Brazil, it is also reported that 1000s of nurses have been infected and 100s died (50). The same is the condition in other countries as per reports (51-53) Moreover we believe that a higher rate of infection and mortality among healthcare professionals and their family members could be one of the causes of anxiety. However, contrary to our results, a study in Iran in the early days of COVID-19 showed different outcomes with zero cases of infection among nurses (35).

In our survey, the vast majority of participants also agree that there is a desperate need for more skilled personnel in health care facilities to address the need that is triggered by the current pandemic in various research studies (54, 55).

Anxiety is an undesirable emotional condition perceived individually and it is reported that anxiety is one of the commonest psychological hurdles of nurses (31). In our study 72 (91.3%) nurses have the overall anxiety ranges from mild to very severe. In a similar study on health care workers conducted in China expressed similar results (56) and in another study that was purely conducted over nurses showed a higher level of anxiety among the nurses which further validates our findings, furthermore in agreement with the results of our study it also showed the anxiety for the family member (35, 57, 58). Moreover, previous studies have also shown a higher level of anxiety and depression among the nurses due to their long interaction with the patients and the nature of their job (32). Similar findings were reported by other studies during SARS and MERS epidemics (24, 59, 60). According to the results of this study, females have more anxiety as compare to males, this is in accordance with the outcome of other studies (61, 62).

Data from COVID-19 research and other outbreaks of infectious respiratory disease indicates strong concern for nurses besides personal or family well-being in the face of close interaction with a potentially deadly virus and the burden of combining this concern with the ethical requirements of continuing to provide care (63, 64).

In our opinion, the high rate of anxiety among the nurses is because of the unavailability of personal protective equipment (PPE), lack of counselling sessions, deficiency of proper health care facilities, etc. Moreover, job stress, demands, exertions may not only harm the psychology and mental health but also on the general wellbeing (65, 66). Moreover due to social media and easy access to the current news and information that the anxiety and obsession have been increased (67, 68). The anxiety of nurses towards their family members to be infected with COVID-19 is significantly on the higher side. Studies have shown that due to the highly contagious nature of this virus healthcare professionals are in stress and depression as they might transfer the infection to their family members (40). In order to reduce the anxiety counselling sessions should be organized. The same recommendations were given in parallel studies as the wellbeing of the mental state is crucial in order to manage infectious diseases (69, 70).

**Conclusion**

We conclude that nurses working with COVID-19 patients have a good understanding of symptoms, illness process, care strategies, etc. Anxiety is highly prevalent among nurses due to COVID-19. It is also recommended that appropriate counselling sessions help them deal with the pandemic. We agree that adequate preparation and mentoring along with fortnightly or monthly refresher course will aid in coping with such circumstances.

**Conflict of Interest:**

The authors declare that they do not have any interests that could constitute a real, potential or an apparent conflict of interest for their involvement in the publication.

**Funding:** None

**Acknowledgements:** We acknowledge the support of the ethic and review committee of Altamash Institute of Dental Medicine, Karachi, Pakistan. We would like to extend heartfelt graciousness to Dr. Shaob Durrani from Durrani Dental Clinic, Karachi, Pakistan, Mr. Muhammad Saqlain of Quaid –e-Azam University, Pakistan and MS, Marzieh Nemati, Bahareh Ebrahim and Fatemeh Nemati of Shiraz University of Medical Sciences, Iran and to all the participants and people who provided support at every step of the research.
Strength and Limitations:
This study emphasized the less discovered field where very limited literature was available. The sample size was limited as the study only comprises of the nurses from Karachi, Pakistan working with COVID-19 so the results cannot be generalized. It was an online survey so factors like dishonest answers and biasness should be considered.

Author’s contribution:
AS and MM conceived the study and designed the questionnaire. HM, SM and SH collected data. SM and SH performed statistical analyses and prepared tables and figures. MM, FH and AS drafted the manuscript. AS reviewed the manuscripts. MM supervised the project and is responsible for the integrity of the research. All authors contributed comprehensively contributed in writing and critically revised and approved the final draft of the manuscript.

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