

Covid-19 Infection among Frontline Worriers

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ABSTRACT

Objective:

The objective of this study is to evaluate the COVID-19 infection in frontline worriers in tertiary care hospitals and assessed the preventative measures regarding the risk of COVID-19 infection in frontline worriers.

Methods:

Healthcare workers were collected the oropharyngeal and nasopharyngeal swabs and put into a 3 ml viral transport media (VTM) and transported to Molecular & Central Research Laboratory, Lahore General Hospital, Lahore. PCR technique was used on these samples to check the COVID-19 infection.

Results:

1000 healthcare workers were included in this study to check the prevalence of COVID-19 infection among the frontline healthcare workers. Ratio of the male patients were greater than females. 67% males and 33% females were effected with Covid-19. Our analysis

reveals age group 1 (26.8%), group 2 (33.2%), group 3 (78.9%), and group 4 (27.6%) were effected with COVID-19 Virus.

Conclusion:

Our study of COVID-19 infection among frontline worriers in tertiary care hospital indicated that males from age group 3 (40-49) are more affected with COVID-19 virus. Social isolation and universal masking, must be strictly implemented among medical staff in the community to prevent nosocomial infections.

INTRODUCTION

At the end of 2019, a novel coronavirus 2 (Severe Acute Respiratory Syndrome Coronavirus-2 SARS- nCov-2) disease was declared which is related to SARS and MARS that was discovered in 2003 and on 11th march 2020 this was declared pandemic by World Health Organization. Millions of life (including healthcare workers, nurses, and allied health professionals) was disrupt all over the world [Ghebreyesus, 2020]. The outbreak of coronavirus initiated as pneumonia of unknown cause in December 2019 in Wuhan, China, which has been now spreading rapidly out of Wuhan to

other countries [Abid et al., 2020]. The intensity of symptomatic infections ranges from minor to life-threatening. Almost 80% of cases have minor signs, while <20% found with serious signs such as shock and dyspnea; severe lung disease or respiratory failure arises in <5% of cases [Bajema et al., 2020; Chan et al., 2020; Chen et al., 2020; Wang et al., 2020].

Person-to-person transmission has been confirmed [Phan et al., 2020; Zhou et al.]. Although the government of Pakistan lockdown all around the country but hospitals were overcrowded and became critical locations to curb the spread of COVID-19. Unlike SARS or MARS, SARS-CoV2 was less intimidating, with a low mortality rate [Chen, 2020; Mahase, 2020; Wu et al., 2020]. However, there are an unreasonable number of asymptomatic carriers as a result of low virulence and longer incubation period [Zou et al., 2020]. These patients may not take appropriate precautions and may thus become a means of transmission [Li et al., 2020]. Asymptomatic transmission to hospital can further increase the risk of super outbreaks in hospitals [Cho et al., 2016]. The disease burden is expected to increase as the community continues to spread among the asymptomatic individuals. As a result, the roles that patients face will consistently require front-line healthcare workers. Because SARS CoV-2 patients require personal exposure to this work, frontline healthcare workers have a higher risk of infection, which contributes to its further spread [Black et al., 2020]. Beginning assessments recommend that frontline worriers could represent 10–20% of all diagnosis [COVID, 2020; Lazzarini and Putoto, 2020], with some early proof that individuals from Black, Asian, and minority ethnic background are at higher risk [Kirby, 2020].

Previous practices with other respiratory viruses have shown that regular use of personal protective equipment is necessary to reduce hospital acquired transmission [Verbeek et al., 2020]. UK and USA guidelines recommend the use of masks for healthcare workers who care for people with COVID-19 [Control and Prevention, 2020; Nguyen et al., 2020].

COVID-19 is a threat to doctors and nurses working in the departments of critical care, emergency medicine, infectious diseases and pulmonary medicine. To reduce the risk of infection and transmission of COVID-19, it is important to follow the use of personal protective equipment, proper hand washing and hand hygiene. Therefore, there must be sufficient training, knowledge and resources to prevent nosocomial infection that infect other patients in these departments due to cross-contamination [Khan and Karataş, 2020; Munoz-Price et al., 2019; Organization].

In order to prepare the healthcare system, evaluate the effectiveness of infection prevention policies and better understand the risk of spreading COVID-19 to HCW, there is an urgent need for

SARS-CoV-2 infection data between HCWs in Pakistan and optimization of its safety Related strategies [Bellisle, 2020]. Here, we describe the method of establishing a high-throughput employee testing center, the infection rate between symptomatic front-line employees and non-first-line employees, and the clinical outcomes related to COVID-19 among these employees

MATERIAL AND METHODS

Study Design:

We all together enrolled 1000 healthcare professionals with COVID-19 at Tertiary Care Hospital in Lahore Pakistan, from April 30, 2020 to August 17, 2020. Clinical history including exposure, epidemiologic, demographic information and travel history was taken at the time of sampling and the other clinic-radiological history was taken from electronic medical records. Frontline worriers were defined as individuals who worked in fever clinics or wards and provided direct care to patients with certified or suspected COVID-19. Non-Frontline worriers were assessed as individual who normally participated in patients (i.e. patients without COVID-19). This study was approved by research ethical committee of Lahore General Hospital.

Personal Protective Equipment Protocols:

Personal protective equipment (PPE) used in areas where very low risk of disease transmission included surgical masks, surgical gloves, gowns, and not reusable caps. The PPE used in the areas where high risk of disease transmission included N95 mask, long disposable gowns, close fitted glasses with side shield, not reusable caps, surgical gloves, and shoe covers.

Sampling Process:

COVID-19 BSL-III laboratory tests followed the WHO recommendations [Organization, 2020]. Healthcare workers were collected the oropharyngeal and nasopharyngeal swabs and put into a 3 ml viral transport media (VTM) and transported to Molecular & Central Research Laboratory, Lahore General Hospital, Lahore. PCR technique was used on these samples to check the COVID-19 infection by using previously described methods [Ghazala Rubi et al., 2021].

RESULTS AND DISCUSSION

1000 healthcare workers were included in this study to check the prevalence of COVID-19 infection among the frontline healthcare workers.

Statistical Analysis:

Out of 1000, 67.70% (677) were males and 32.30% (323) were females. Gender ratio are shown in (Figure-1).

Healthcare Workers Positivity Ratio:

Out of 1000 HCWs 29.60% were positive and 70.40% were found negative. Positive and negative ratio is shown in (Figure-2).

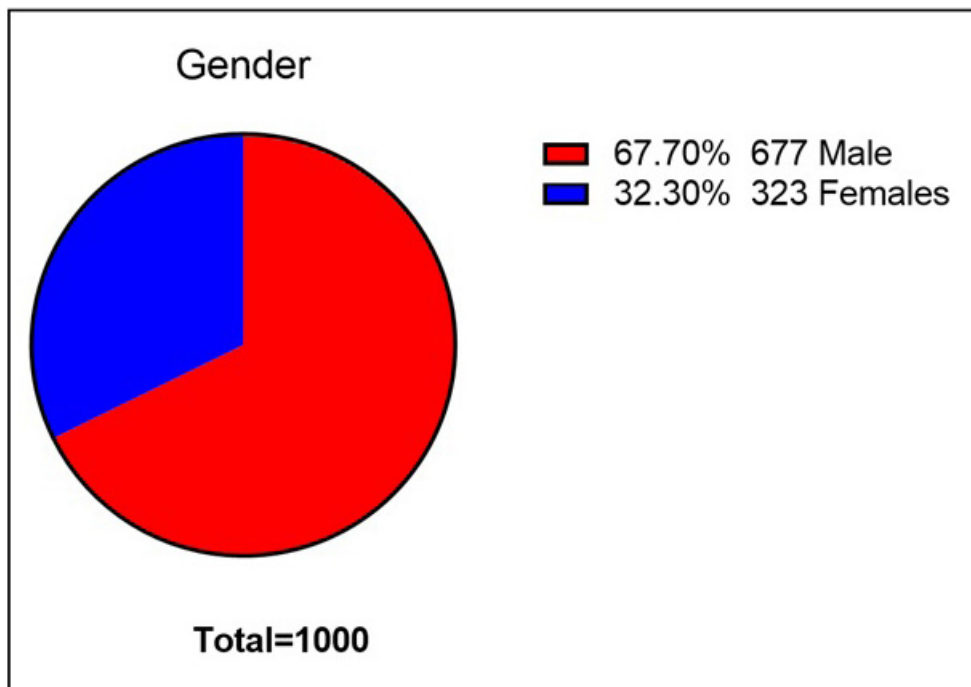


Figure 1: Gender Ratio

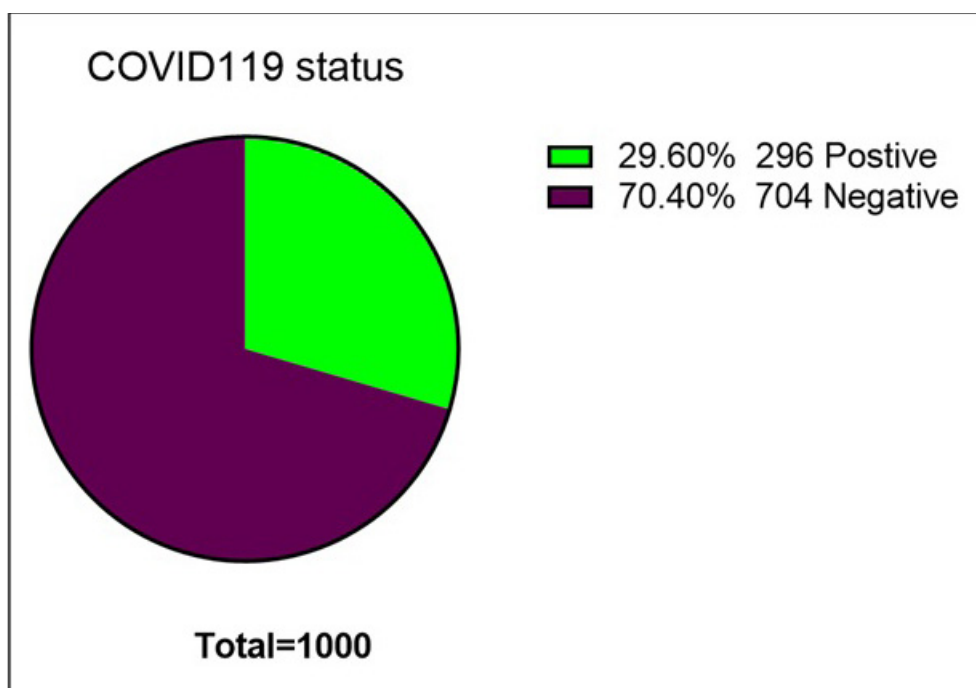


Figure 2: HCW’s Positive Ratio

ASSOCIATION BETWEEN GENDER AND COVID-19 STATUS:

On association gender vs COVID-19 status, 198 males and 98 females were positive. Slight positive ratio was seen in females, which is 30.3% while in male’s positive ratio was 29.2 %. Association of gender and COVID-19 status is shown in the bar chart (Figure-3).

Association Between Age Groups and Covid-19 Status:

Total 04 groups were prepared to check the association between different age groups and COVID-19 positive and negative ratio. Patients less than 30 age were included in group 1, from 30-39 in group 2, 40-49 in group 3 and more than 49 years old patients were included in group 4. Statistical analysis shows that age group 1 (26.8%), group 2 (33.2%), age group 3 (78.9%) and age group

4 (27.6%) were found positive for COVID-19. Association shows that positive ratio of age group 3 (40-49 years) were very high rather than other 3 groups. Association of different age groups and COVID-19 status is shown in bar chart (Figure-4).

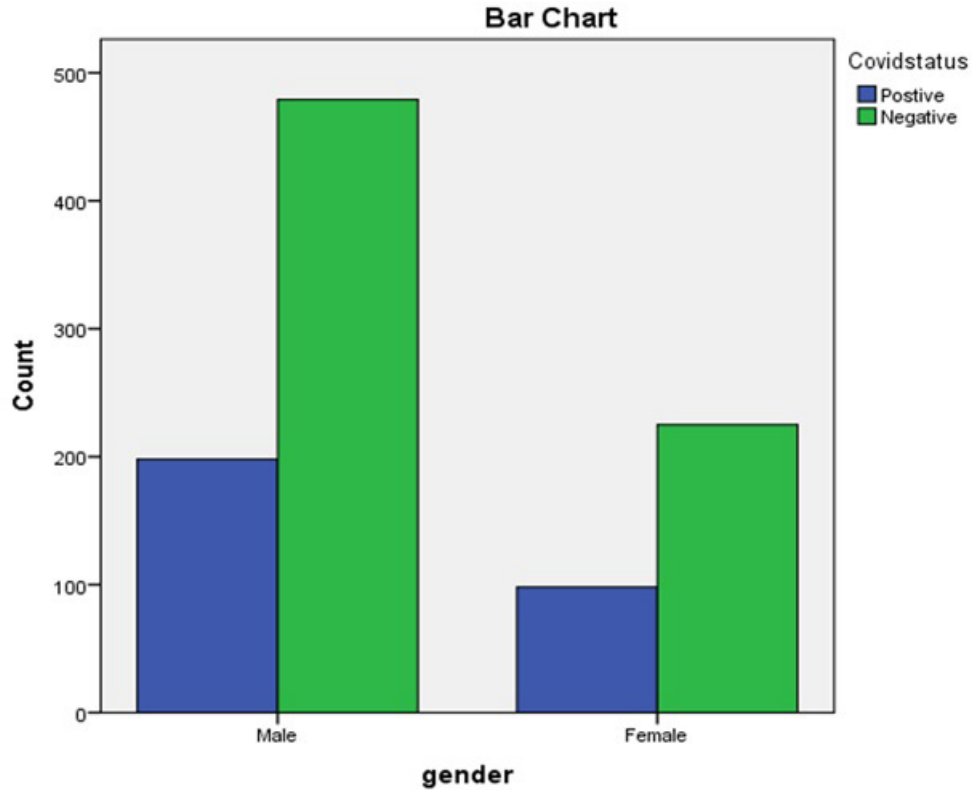


Figure 3: Association of Genders Positive & Negative Ratio

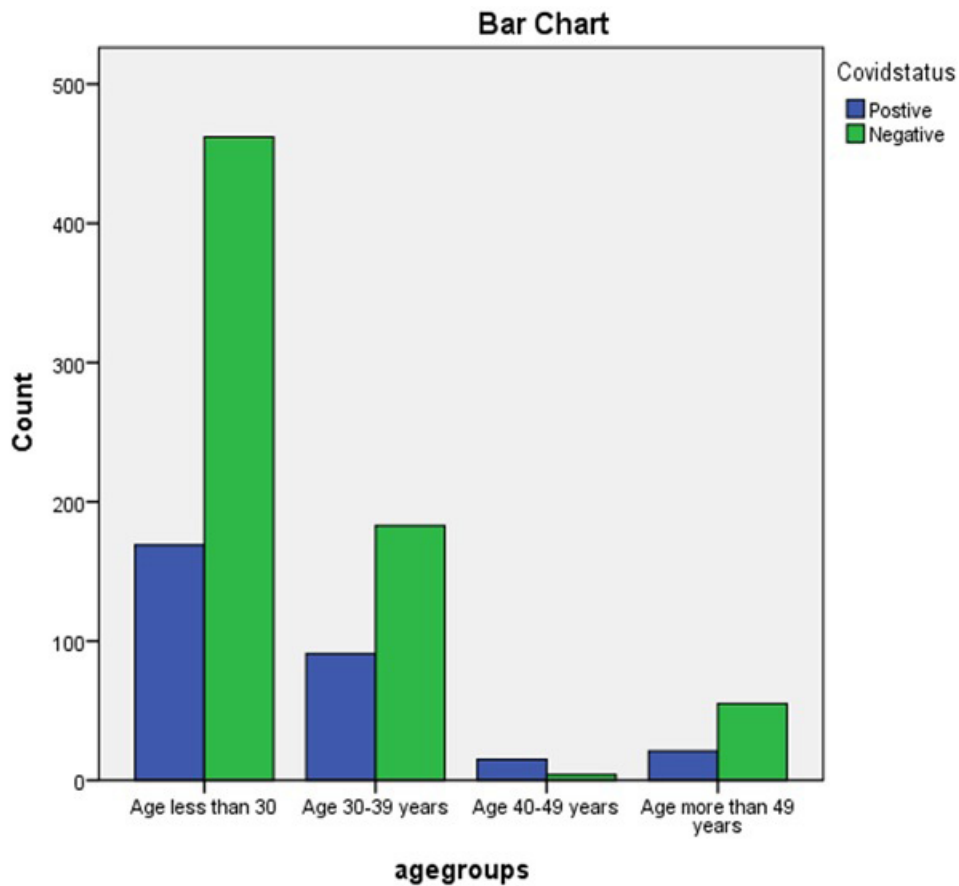


Figure 4: COVID-19 Positive & Negative Ratio of Different Age Groups

Association between Age groups and Genders:

Statistical association shows that males from age group (40-49) are higher positive ratio (89.5%) than other three groups. Age group (<30) shows males are (67%) positive while females are

(33%) positive, from age group (30-39) males (66.4%) & females (33.6%), from age group (40-49) males (89.5%) & females (10.5%) and from age group (>49) males (72.4%) & females were (26.7%) positive. Gender vs age groups association is shown in bar chart (Figure-5).

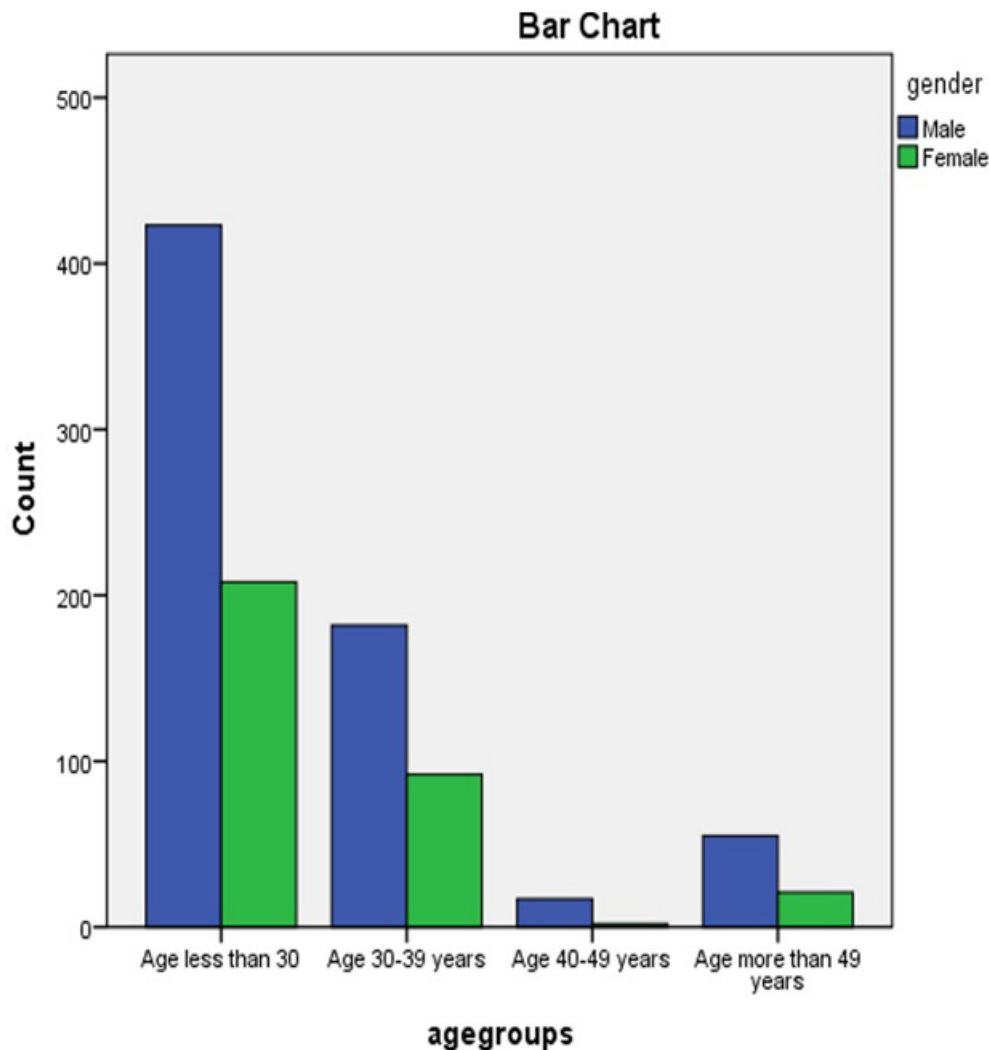


Figure 5: Gender Wise Positive & Negative Ratio of Different Age Groups

DISCUSSION

COVID-19 disease is a developing worldwide wellbeing concern and has infected a critical segment of the total populace. In this study, we explore COVID-19 infection among frontline worriers working in in tertiary care hospital. The COVID-19 disease is growing to more than 222 countries around the world. Until now around 151,159,899 peoples are affected with COVID-19 virus and around 3,179,925 deaths are reported all around the world. A large number of frontline worriers expressed low level of awareness and vigilance for COVID-19. HCW's still work during COVID-19, risking their lives to save lots of their patients.

Statistical analysis of our study shows that out of 1000 HCWs 296 cases were found positive for COVID- 19 and 704 cases were

negative. Out of 296 positive cases 67% were males & 33% were females. This is significantly higher in males and lower in females than a study from Wuhan, China, which indicated that 50.7% males were effected with COVID-19 while 49.3% were females [Zhang et al., 2020]. In this study, we found 296 positive cases that shows males are more affected then females. As indicated by Sharma. et al, the MERS & SARS-CoV, were found to infect more men than women [Alghamdi et al., 2014]. In the mouse model study of SARS-CoV infection, male mice were more susceptible to infection than female mice. The increased sensitivity of male mice to SARS-CoV is associated with a moderate increase in virus titer and accumulation of alveolar macrophages and neutrophils in lung [Channappanavar et al., 2017].

Another object of the study was age wise distribution in which we found 26.8% less than 30 years, 33.2% in age group 30-39, while majority of the cases fall in age group of 40 – 49 years that is 78.9%, whereas more than 49 years' cases were 27.6%.

Statistical association between age group and COVID status show the clear picture of p-value < 0.005 that is highly significant.

So, our study focused on primary healthcare facilities in tertiary care hospitals in Lahore Pakistan regarding prevention of frontline healthcare workers from the risk of COVID-19 infection. Our research provides insights and shows the need to take immediate and decisive efforts to focus on training programs and provide enough PPE to alleviate these challenges during the COVID-19 pandemic. We found high significant value in the age group of (40-49 Years) HCWs.

CONCLUSION:

Collectively, our study of COVID-19 infection among frontline worriers in tertiary care hospital indicated that males from age group 3 (40-49) are more affected with COVID-19 virus. Health care workers are at a high risk of contracting COVID-19 in the workplace. There are many reasons that may lead to COVID-19 among healthcare workers, such as low compliance with infection control preventive measures, non-compliance with social distancing and general masking during eating, and late diagnosis of healthcare workers with mild symptoms. The COVID-19 infection control measures applicable to the community, such as social isolation and universal masking, must be strictly implemented among medical staff in the community to prevent nosocomial infections.

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