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Effect of COVID-19 on healthcare workers' morbidity and mortality compared to the general population in Kohgiluyeh and Boyer-Ahmad Province, Iran

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Abstract

During the Covid-19 pandemic, the adverse effects of recent coronaviruses on healthcare professionals cannot be ignored. This study compared the admission rates due to Covid-19 and characteristics of hospitalized healthcare workers with the general population of Kohgiluyeh and Boyer-Ahmad (K.B) province. 18546 hospitalized patients infected with Covid-19 in hospitals in four cities of K.B province were enrolled in this study; of them, 236 (1.27%) patients were healthcare workers. Demographic and clinical data of hospitalized cases due to Covid-19 infection were collected from August 2020 to September 2021. The underlying diseases were also considered in this study. According to our findings, 55.5% of the hospitalized healthcare workers were male, and 44.5% were female; their mean age was 41.41 years. However, in the general population, hospitalization rates were higher for women than for men (51.2% and 48.8%, respectively). Although the SARS-CoV-2 infectivity rate was higher in healthcare workers compared to the general population (68.6% vs. 56.1%), the mortality rate was significantly lower in them (1.7% vs. 3.8%). Fever, cough, Acute Respiratory Distress Syndrome, headache, and myalgia were the most prevalent symptoms in both groups. Among the cases examined in this study, inpatient ones aged 30–40 years and the general population aged over 60 seemed to be more likely to be hospitalized for Covid-19. The hospitalization rate of healthcare workers during the pandemic follows the same pattern as the general population, but since the start of vaccination, this rate has decreased among healthcare workers compared to the general population of KB province.

KEYWORDS

COVID-19, death, healthcare worker, infection rate, Iran

Wuhan, China, reporting a rate of 52% among nurses. This could be due to the fact that nurses averagely spent more time in contact with patients in comparison to other HCWs, such as physicians.[27] In the same line, Barrett and colleagues revealed a higher prevalence of infection among the HCWs who had direct contact with Covid-19 patients, with nurses comprising the majority of the affected HCWs (62.5%).[28] In another study conducted by Lahner and colleagues in Italy, 2057 HCWs were tested by PCR from of March 18 to April 27, 2020 and positive test results were obtained for 58 of them (3%). Among these individuals, 53 (91.4%) had direct contacts with Covid-19 patients (physicians and nurses), and 5 of them (8.6%) were HCWs with indirect contacts with these patients.[29] Another research investigated the seroprevalence and relative chances of SARS-CoV-2 infection among HCWs employed in various professional categories. In this cross-sectional investigation on 82,961 serological tests, 12.2% of the Italian HCWs tested positive for IgG antibodies against SARS-CoV-2. Additionally, nurses, auxiliary health workers, and the personnel who worked in emergency rooms or were involved in the treatment of patients with subacute diseases had a higher risk of infection.[30] In the early phase of the Covid-19 outbreak, the number of HCWs and PPE was insufficient, and the continuous working hours of HCWs were relatively long. As a result, HCWs were physically and mentally exhausted. In this condition, HCWs experienced lowered immunity and had an increased risk of infection. As a result, HCWs on the frontlines are recommended to get enough rest and sleep, avoid overworking, and follow a balanced diet with supplements to maintain proper nutrition. This will boost their immunity and lower the risk of infection in them.[27]

In the current research, males had a higher incidence of infection and hospitalization (55.3%) compared to females, but the difference was not statistically significant ($p = 0.106$). Consistently, Iversen and colleagues conducted a study in Denmark and indicated that the male personnel had a higher prevalence of the condition in comparison to female ones. This was attributed to the unknown underlying patterns of transmission or different behaviors. For example, women might be more cautious in following the healthcare advice.[31] The data obtained from the Global Health 5050 also showed that the number of Covid-19 confirmed cases and the death rate of the disease were both high among males in various nations.[32,33] This might have happened because the behavioral variables and roles that enhance the likelihood of Covid-19 infection are more common in males. Men are more likely to engage in dangerous behaviors such as drinking, participating in performing the funeral rites, working in basic sectors and occupations requiring them to stay active, working outside their houses, and socializing with others.[34–36]

In the current research, the most common symptoms reported by the hospitalized HCWs and general population were cough, myalgia, ARDS, fever, and headache. Similarly, Yang and colleagues mentioned fever, cough, and shortness of breath as the most common symptoms amongst HCWs and general population.[37]

Among the patients under the present investigation, 3.4% of the HCWs and 4.6% of the general population were admitted to ICUs. Evidently, the HCWs were less likely to require admission to ICUs. Moreover, 2.1% of the HCWs and 3% of the general population needed mechanical treatment. Unfortunately, 1.7% of the HCWs and 3.8% of the general population died due to Covid-19. These results are in the same line with those of the studies carried out by Yang and colleagues and Alshamrani and colleagues which demonstrated a lower need for ICU admission, use of mechanical treatment, and mortality in HCWs than in general population.[37,38]

On February 9, 2021, Iranian Ministry of Health started offering SARS-CoV-2 vaccines to HCWs. As mentioned before, there were three maxima in SARS-CoV-2 hospitalization during the research period. In the first peak, 27.6% of the HCWs became hospitalized, while the hospitalization rate of general population was 8.8% at that time. In the second and third peaks, however, the hospitalization rates were respectively 8.9% and 3.8% among the HCWs and 13.5% and 20.3% among the general population. The reduction observed in the infection rate of the HCWs could be related to their vaccination as well as their better compliance with health protocols. In the same vein, Bouton and colleagues found that SARS-CoV-2 vaccinations reduced the infection rates when the prevalence of the disease was high in the country. According to their findings, the vaccinated HCWs showed a 27% reduction in new cases about 1–14 days after the first dose and an 82% reduction after 15 days compared to unvaccinated HCWs.[39,40] A reduction in positive test results 14 days after the second dose was also observed in another study, which assessed SARS-CoV-2 infection after vaccination in Californian HCWs.[41] Decreased positive test results postvaccination have also been reported among HCWs in England and other parts of the United States.[42,43]

In conclusion, we found that although the SARS-CoV-2 infection rate among hospitalized HCWs was higher than the general population (68.1% vs. 56.1%), the Covid-19 mortality rate was lower (1.7% vs. 3.8%). SARS-CoV-2 infection in the HCWs has shown a decreasing trend over time since the beginning of the pandemic, unlike the general population.

AUTHOR CONTRIBUTIONS

Mohsen Jalil: Conceptualization; data curation; methodology; writing – original draft; writing – review and editing. **Zahra Ashkan**: Data curation; formal analysis; methodology; writing – original draft; writing – review and editing. **Mohammad Gholamnezhad**: Conceptualization; supervision; writing – review and editing. **Somayeh Jamalidoust**: Formal analysis; methodology; writing – review and editing. **Marzieh Jamalidoust**: Conceptualization; data curation; funding acquisition; resources; supervision; writing – original draft; writing – review and editing.

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