

# **Attitudes of Physicians and Nurses toward COVID-19 Mandatory Vaccination**

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## **Abstract**

Voluntary vaccination against COVID-19 has been suboptimal worldwide. One strategy to overcome vaccination reluctance is for governments to implement a mandatory COVID-19 vaccination policy. Opposition to such a policy is swathed in unfounded misconceptions and skepticism about the safety and effectiveness of COVID-19 vaccines. The current cross-sectional study investigated the relationship between attitudes toward COVID-19 vaccines and disapproval of implementing a COVID-19 mandatory vaccination policy among health care workers. It also examined the role of gender, occupation type, and age in support for COVID-19 mandatory vaccination policies. Data were collected from 346 unvaccinated physicians and nurses in Oman. The results show that negative attitudes toward COVID-19 vaccines and lack of support for a COVID-19 mandatory vaccination policy were positively related ( $r = .68, p = .000$ ). ANCOVA showed that male health care workers, after controlling for age, were more likely to endorse mandating COVID-19 vaccinations. There was no difference between physicians and nurses in support for mandatory vaccination, after controlling for age. This research provides insights from a middle-income country about the attitudes of its health care providers toward compulsory COVID-19 vaccination.

**Keywords:** COVID-19; Mandatory Vaccination; Health Care Workers; Oman

## **Introduction**

In a short span of time, the COVID-19 pandemic has caused profound devastation, suffering, and death worldwide. Since the onset of the pandemic, public health intervention measures, including wearing facemasks, social distancing, and travel restrictions, have been mandated in many countries as the best methods to halt the spread of COVID-19. However, groups such as antimask and antilockdown have voiced strong objections to these mandates<sup>1</sup>. In less than a year, safe and effective COVID-19 vaccines were developed helping to further reduce the likelihood of people getting COVID-19 and spreading it. The uptake of the newly developed vaccines, however, met with opposition in some parts of the world.

The widespread hostility to voluntary COVID-19 vaccination has hampered health authorities' efforts to control the spread of the disease. Faced with a vaccine-hesitant public, many health authorities around the world were forced to implement mandatory COVID-19 vaccination policies. A similar policy has also been adopted by private entities, including health care employers. However, a sizable proportion of both the public and health care workers (HCWs) has objected to mandatory COVID-19 vaccination. In the United States<sup>2</sup>, 37% of unvaccinated individuals said they would quit their job rather than get vaccinated. Almost half of the population in Austria and France (43% and 42%, respectively) disagreed that COVID-19 vaccines should be compulsory<sup>3,4</sup>. Among French hospital workers only 35% of were supportive of mandatory vaccinations<sup>5</sup>. Many reasons were offered for opposing mandatory COVID-19 vaccination including ethical, legal, religious, and practical reasons, mistrust of health authorities and the medical establishment, conspiracy theories, as well as right-wing ideology<sup>6,7</sup>

Other scholarly work indicated that opposition to mandatory vaccination is generally grounded in mistrust in the effectiveness and safety of the COVID-19 vaccines<sup>8</sup>. To illustrate,

findings from New Zealand <sup>9</sup>, Italy <sup>10</sup>, and Germany <sup>11</sup> found that confidence in the vaccine is sufficiently and positively related to support for mandates.

The above review shows that there is a paucity of data from low- and middle-income countries about attitudes toward mandatory COVID-19 vaccination. Hence, the study presented here has two main objectives based on data collected from a sample of unvaccinated HCWs in Oman. The first objective is to explore the connection between confidence in the COVID-19 vaccines and endorsement of mandatory vaccination for HCWs. The second objective is to investigate whether endorsement of a mandatory vaccination policy is influenced by age, gender, or job type.

## **Material and Methods**

### ***Participants***

The data for this study was collected through an anonymous web-based survey between January 7 and January 20, 2021, after COVID-19 vaccines became available in Oman. The sample consisted of 346 unvaccinated physicians and nurses recruited from multiple public and private health care facilities. The study procedures were approved by the Institutional Review Board at the last author's institution.

### ***Measures***

The survey consisted of two main parts. The first part collected sociodemographic information about the participants and their experience with COVID-19. We asked about their age, gender, and occupation (physician or nurse), whether they had ever tested positive for COVID-19, and whether they had cared for COVID-19 patients. Those questions were followed by the

response options “yes,” “no,” and “not sure.” The second part of the survey contained items about attitudes toward the COVID-19 vaccine and support for mandatory vaccination for HCWs.

*Confidence in the COVID-19 vaccines* measure consisted of six items. An example of an item is “I think the COVID-19 vaccine might cause unknown serious health problems.” Principal axis exploratory factor analysis with the Promax procedure ( $k = 4$ ) showed that these items accounted for 53.43 % of the variance in the data. The Cronbach’s alpha coefficient was .87. The *support for mandatory vaccination* measure was gauged by one item: “All health care workers should be required to get the COVID-19 vaccine.” All items were rated using a 5-point Likert scale that ranged from “strongly disagree” to “strongly agree.” A higher score indicates a greater lack of confidence in the COVID-19 vaccines. The mandatory vaccination item was recoded so that the higher the score, the greater the opposition to mandatory COVID-19 vaccination.

## **Data Analysis**

Pearson’s correlation was used to test the relationship between the two attitudinal measures. Analysis of variance (ANOVA) was used to examine differences in means by gender (male vs. female) and job type (physician vs. nurse). Finally, a two-way analysis of covariance (ANCOVA) test was performed with gender and job type as independent variables. Support for mandatory vaccination was the dependent variable and age was the covariate.

## **Results**

Inspection of the data for missing values showed that 11% of the data on age was missing. Results from Little’s Missing Completely at Random (MCAR) was not significant,  $\chi^2(35) = 41.48$ ,  $p = .22$ . Hence, we employed the expectation maximization data imputation procedure<sup>12</sup>.

Slightly more than half (52.3 %) of the participants were nurses and 47.7 % were physicians. Almost two-thirds (61.2%) of the physicians and 85.6% of the nurses were females. The majority of HCWs (67.6%) provided care for COVID-19 patients and 27.3% had tested positive for COVID-19. The mean age of the HCWs was 40.22 (SD = 8.17). Descriptive statistics are reported in Table 1.

**Table 1.** Demographic Characteristics of the HCW's in the Cohort (n = 364).

Characteristics	Physician	Nurse
Sample size (N, %)	165 (47.7)	181 (52.3)
Gender (N, %)		
Male	64 (38.8)	26 (14.4)
Female	101 (61.2)	155 (85.6)
Age, mean (SD)		
Male	46.8 (9.29)	36.7 (6.72)
Female	40.3 (7.64)	38.1 (6.66)
Cared for COVID-19 patients	111 (68.1)	121 (67.2)
Tested positive for COVID-19	29 (17.8)	64 (36)

A one-way ANOVA revealed that males (M = 43.85, SD = 9.75) were on average older than females (M = 38.94, SD= 7.13) and physicians (M = 42.81, SD = 8.88) were on average older than nurses (M = 37.85, SD = 6.67; ( $F(1, 344) = 25.84, p = .000$ ;  $F(1, 344) = 34.77, p = .000$ ; respectively). Pearson's correlation analysis indicated a statistically significant positive

relationship between lack of confidence in the COVID-19 vaccines and opposition to mandatory COVID-19 vaccination ( $r = .68, p = .000$ ).

Next, we conducted an ANCOVA test to examine the main effects of gender (male vs. female) and job type (physician vs. nurse) as well as interaction between gender and job type on support for mandatory vaccination after controlling for age (Table 2). The ANCOVA test revealed a significant main effect of gender on support for mandatory vaccination ( $F(1, 341) = 5.77, p = .02$  (partial  $\eta^2 = 0.02$ ) while job type had no effect on support for mandatory vaccination ( $F(1, 341) = .25, p = .62$ ).

**Table 2.** Means, Adjusted Means, Standard Deviations, and Standard Errors for HCW's Support of Mandatory Vaccination after Controlling for Age.

Measure	Male		Female	
	Physician	Nurse	Physician	Nurse
M (SD)	1.77 (.87)	1.69 (.93)	2.00 (1.0)	2.15 (.90)
M <sub>adj</sub> (SE)	1.88 (.13)	1.64 (.19)	2.00 (.09)	2.11 (.08)

Age did have an impact on support for mandatory vaccination ( $F(1, 341) = 5.71, p = .02$  (partial  $\eta^2 = 0.02$ ). There was, however, no statistically significant interaction between gender and job type on support for mandatory vaccination when controlling for age ( $F(1, 341) = 1.96, p = 0.16$ ).

## Discussion

The aims of this study were to investigate the relationship between confidence in COVID-19 vaccines and support for mandatory vaccination against COVID-19 and the role of gender, job type, and age in support for mandatory vaccination.

Vaccination against COVID-19 disease is the most effective public health strategy for achieving herd immunity. Opponents of this strategy have justified their position on, among other reasons, ethical, practical, and political grounds as well as concerns about the efficacy and safety of the vaccines<sup>6,7</sup>. Our findings show a strong positive relationship between lack of confidence in the COVID-19 vaccines and opposition to mandatory COVID-19 vaccination policies among HCWs. This association has been reported in studies from high-income countries. For example, support for mandatory vaccination was highly correlated with vaccine acceptance in Austria<sup>3</sup>, France<sup>4,5</sup>, and several South Asian countries<sup>13</sup>.

Male HCWs in our study were more likely than females to endorse mandatory COVID-19 vaccination policies. This finding is consistent with a finding from a recent study from Germany<sup>11</sup>. Men support for mandating COVID-19 vaccination might reflect the general trend observed in vaccine hesitancy studies men were more likely than women to uptake COVID-19 vaccines<sup>14,15</sup>. For example, 49% of male HCWs in the United States accepted the COVID-19 vaccine compared to 31% of females<sup>16</sup>. One explanation offered in the literature is that most women possess intimate experience of vaccines due to their caregiver roles<sup>17</sup>. Another possible explanation is concerns about unforeseen effects of the COVID-19 vaccines on pregnant and lactating women<sup>18,19</sup>.

Physicians and nurses, when controlling for age, did not differ in their support for COVID-19 mandatory vaccination. Nevertheless, consistent with previous studies<sup>9,11</sup>, we found that



younger HCWs were less supportive of mandatory vaccination compared to older ones. One plausible interpretation is that older HCWs are at higher risk of infection than younger HCWs.

Although support for mandatory vaccination for HCWs is steadily growing among healthcare leaders <sup>20</sup>, to garner further support, health authorities should consider multiple strategies to increase confidence in the safety and effectiveness of COVID-19 vaccines. HCWs also need to be reminded that HCWs are ethically and professionally obligated to get vaccinated to prevent the transmission of COVID-19 to patients and the spread of the infection in health care settings <sup>19</sup>. Another approach is to emphasize the notion that vaccination against COVID-19 is morally expected for the safety and health of the entire society <sup>21</sup>. At this moment in the history of this international health crisis, mandating COVID-19 vaccination is the best choice that health care authorities have to control the spread of this disease. Which in turn lowers the rate of infection and hospitalization, which would free up hospital beds for non-COVID-19 patients.

The strength of our study resides in its timing and population. This study was carried out in 2021 during the rollout of the COVID-19 vaccination campaign for HCWs in Oman. This study provides insights about how HCWs in an Arab middle-income country think about mandatory COVID-19 vaccination. It has some limitations that future research should strive to overcome. First, this study is a cross-sectional survey, which impedes the use of causal language in discussing its findings. Second, the sample does not represent all HCWs in Oman; thus, caution must be exercised in generalizing our findings. Third, the study focused on the role of misconceptions about COVID-19 vaccines in forming HCWs' attitudes toward mandatory vaccination. Future work might consider adding other explanatory variables.

## Conclusions

The results of this study show that regardless of job type, male and older HCWs were supportive of mandatory COVID-19 vaccination. Increasing the number of fully vaccinated HCWs would decrease the time required to reach herd immunity, which would contribute to eradicating COVID-19. This also means that HCWs, their families, and their patients would be safer.

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