Attitudes of Physicians and Nurses in Oman Toward Mandatory COVID-19 Vaccination

Abdallah M. Badahdah[1], Nawal Al Mahyijari[2], Ryan Badahdah[3], Furqan Al Lawati[4] and Faryal Khamis[5]*

[1]Department of Sociology and Rural Studies, School of Psychology, South Dakota State University, South Dakota, USA
[2]Department of Psychiatry, Sultan Qaboos Comprehensive Cancer Care and Research Center, Muscat, Oman
[3]Department of Chemistry, University of North Dakota, North Dakota, USA
[4]Department of Psychiatry, Al Masarra Hospital, Muscat, Oman
[5]Adult Infectious Diseases, Department of Medicine, Royal Hospital, Muscat, Oman

ABSTRACT

Objectives: To investigate the relationship between attitudes toward COVID-19 vaccines and disapproval of the policy of mandatory COVID-19 vaccination among unvaccinated physicians and nurses in Oman. *Methods*: The subjects were (N = 346) unvaccinated physicians and nurses in Oman. Their demographic data and attitudes regarding COVID-19 vaccines and mandatory vaccination policy were collected through an anonymous web-based survey and statistically analyzed. *Results:* The participants' negative attitudes toward COVID-19 vaccines were positively related ($r = 0.68$, $p < 0.001$) to the extent of their non-support for COVID-19 mandatory vaccination policy. Analysis of variance test showed that after controlling for age, male healthcare providers were more likely to endorse mandating COVID-19 vaccinations. There was no difference between physicians and nurses in support of mandatory vaccination, after controlling for age. *Conclusions:* Regardless of job type, male, and older physicians, and nurses in Oman were more supportive of mandatory COVID-19 vaccination than their younger and female counterparts. This research provides insights from an Arabian Gulf country about the attitudes of its unvaccinated healthcare providers toward compulsory COVID-19 vaccination.

S oon after World Health Organization declared COVID-19 as a pandemic in March 2020, most countries mandated public health measures including facemasks, social distancing, lockdowns, and travel restrictions to halt its spread. Some activist groups voiced strong objections to these mandates.[1] COVID-19 vaccines were developed within a year, which helped reduce the spread of the pandemic. The uptake of these vaccines also met with opposition in some parts of the world.

As hostility to voluntary COVID-19 vaccination hampered the efforts to control the pandemic, many health authorities decided to implement mandatory COVID-19 vaccination policies, especially among the most exposed groups such as healthcare workers. The administrations of private healthcare institutions also introduced their own mandates. However, a proportion of healthcare workers and the general public continued to object to mandatory COVID-19 vaccination. In the US,[2] 37% of unvaccinated individuals expressed their determination to avoid vaccination even at the cost of their jobs. Almost half of the population in Austria and France (43% and 42%, respectively) disagreed that COVID-19 vaccines should be compulsory.[3,4] Among French hospital workers, only 35% were supportive of mandatory vaccinations.[5] Many reasons were offered by these dissenters, including ethical, legal, religious, and practical reasons, mistrust of public health authorities, and the medical establishment, conspiracy theories, as well as conservative ideologies.[6,7]

Research also indicated that opposition to mandatory vaccination may be grounded in the mistrust of the effectiveness and safety of the COVID-19 vaccines.[8] Surveys from New Zealand,[9] Italy,[10] and Germany[11] found that people's confidence in the vaccine was sufficiently and positively related to their support for mandates.

Much of the above results have emanated from high-income and Westernized countries. There is a paucity of data from low- and middle-income countries, especially those in the Middle East which

created a data gap. We embarked on our study with two main objectives: (1) to explore the connection between confidence among physicians and nurses in Oman towards the COVID-19 vaccines and their endorsement of mandatory vaccination, and (2) to investigate whether their age, gender, or job type influenced their attitudes towards vaccination mandates.

METHODS

The data for this study was collected through an anonymous web-based survey during 7–20 January 2021, shortly after COVID-19 vaccines became first available in Oman. Our sample consisted of N = 346 unvaccinated physicians and nurses working in Oman, recruited from multiple public and private health care facilities. The study was approved by the institutional review board of the Royal Hospital, Muscat. Ethical approval to conduct the study was granted by the Royal Hospital Ethics and Research Committee (SRC#6/2021), Muscat, Oman.

The survey consisted of two parts. The first part collected sociodemographic information about the participants and their experience with COVID-19. We asked about their age, gender, and occupation, whether they had ever tested positive for COVID-19, and whether they had directly cared for COVID-19 patients. Those questions were followed by three response options 'yes', 'no', and 'not sure'.

The second part of the survey probed the participants' attitudes toward the COVID-19 vaccine and their support for mandatory vaccination for healthcare workers. The section that measured confidence in the COVID-19 vaccines consisted of six items. Example of an item: "*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 six items accounted for 53.4% of the variance in the data. The Cronbach's alpha coefficient was 0.87. The support for mandatory vaccination was gauged by one item: "*All health care providers should be required to get the COVID-19 vaccine*." All items were rated using a five-point Likert scale that ranged from 'strongly disagree' to 'strongly agree'. Higher scores indicated lower confidence in the COVID-19 vaccines.

Pearson's correlation was used to test the relationship between the two attitudinal measures. Analysis of variance (ANOVA) examined differences in means by gender (male versus female) and job type (physician versus nurse). A two-way analysis of covariance (ANCOVA) test was performed with gender and job type as independent variables where the support for mandatory vaccination was the dependent variable and age the covariate.

RESULTS

Inspection of the data for missing values showed that 11.0% of the data on age was missing. Results from Little's Missing Completely at Random was not significant, $\chi^2 (35) = 41.48$, $p = 0.22$. Hence, we employed the expectation maximization data imputation procedure.[12]

The mean age of the participants was 40.2±8.1. Slightly more than half (52.3%) were nurses and 47.7% were physicians. Most physicians (61.2%) and nurses (85.6%) were female. Two-thirds (67.1%) of the participants provided care for COVID-19 patients and 26.9% had tested positive for COVID-19. Descriptive statistics are in Table 1.

A one-way ANOVA test revealed that males (mean age = 43.8±9.7) were on average older than females (38.9±7.1). Physicians (with mean age = 42.8±8.8; F (variation between sample means/variation within the samples) (1, 344): 25.84; $p < 0.001$) were older than nurses (37.8±6.6; F (1, 344): 34.77; $p < 0.001$). Pearson's correlation analysis indicated a significant positive relationship between lack of confidence in the COVID-19 vaccines and opposition to mandatory COVID-19 vaccination ($r = 0.68$; $p < 0.001$).

Next, we conducted an ANCOVA test to examine the main effects of gender and job type (physician versus nurse) as well as interaction between gender and job type on support for mandatory

Table 1: Demographic characteristics of the physicians and nurses (N = 346).

Characteristics	Physician n (%)	Nurse
No. of participants	165 (47.7)	181 (52.3)
Gender		
Male	64 (38.8)	26 (14.4)
Female	101 (61.2)	155 (85.6)
Male, mean age ± SD	46.8 ± 9.2	36.7 ± 6.7
Female, mean age ± SD	40.3 ± 7.6	38.1 ± 6.6
Cared for COVID-19 patients	111 (67.3)	121 (66.9)
Tested positive for COVID-19	29 (17.6)	64 (35.4)

Table 2: Means, adjusted (adj) means, SDs, and SEs for the participating physicians' and nurses' support of mandatory vaccination after controlling for age.

Measure	Male		Female	
Support for mandatory vaccine	Physician	Nurse	Physician	Nurse
Mean (SD)	1.7 (0.8)	1.6 (0.9)	2.0 (1.0)	2.1 (0.9)
Adj mean (SE)	1.8 (0.1)	1.6 (0.1)	2.0 (0.1)	2.1 (0.1)

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 = 0.020, η_p^2 = 0.02) while job type had no effect on support for mandatory vaccination (F (1, 341) = 0.25, p =0 .620).

Age did have an impact on support for mandatory vaccination (F (1, 341): 5.71; p = 0.020, η_p^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 = 0.160).

DISCUSSION

This study investigated 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 has been recommended as the most effective public health strategy for achieving herd immunity. However, willingness for voluntary vaccination has been suboptimal worldwide. One strategy to overcome this reluctance has been for governments to implement mandatory COVID-19 vaccination policies. Opponents have justified their position mainly on ethical, practical, and political grounds as well as concerns about the efficacy and safety of the COVID-19 vaccines.[6,7] Our findings show a strong positive relationship between lack of confidence among physicians and nurses in Oman in the COVID-19 vaccination and their opposition to mandatory vaccination policies. This association has been reported in studies elsewhere. Similar to our results, the support for mandatory vaccination was highly correlated with vaccine acceptance in Austria,[3] France,[4,5] and some South Asian countries.[13]

Male health providers in our study were more likely than their female counterparts to endorse mandatory COVID-19 vaccination policies. This is consistent with results from Germany.[11] This is also congruent with the findings in other studies that men tend to be less hesitant than women to uptake COVID-19 vaccines.[14,15] For example, 49% of male healthcare workers in the US accepted the COVID-19 vaccine compared to 31% of females.[16] One explanation is that women healthcare workers may possess more direct experience of the process and aftermath of vaccination, due to their caregiver roles.[17] Another explanation is concerns about any unforeseen effects of the COVID-19 vaccines on pregnant and lactating women.[18,19]

Physicians and nurses of similar ages did not differ in their support for COVID-19 mandatory vaccination. Nevertheless, consistent with previous studies,[9,11] we found that younger physicians and nurses were less supportive of mandatory vaccination. One possibility is that older health providers perceive themselves to be at higher risk of infection.

Although support for mandatory vaccination for all healthcare workers is steadily growing among healthcare leaders,[20] health authorities should accelerate this trend via multiple strategies to increase confidence in the safety and effectiveness of COVID-19 vaccines. It should be impressed on all categories of healthcare workers, ranging from senior physicians to janitors, that they 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.[19] It is also essential to remind healthcare professionals that vaccinating against COVID-19 voluntarily and encouraging others to do the same is part of their professional pledge to defend their patients' safety and health, and by extension, the society.[21] 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 importance of our study resides in its timing and the choice of the study population. This study was carried out in early 2021 during the rollout of the COVID-19 vaccination campaign for healthcare workers in Oman, who were in the vaccination priority group, and thus the first to be vaccinated. This study provides insights into how doctors and nurses in an Arab country think about mandatory COVID-19 vaccination. The study has limitations that future research should strive to overcome. First, this is a cross-sectional survey, which impedes the use of causal language in discussing its findings. Second, the sample does not represent all categories of healthcare workers 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 doctors and nurses' attitudes toward mandatory vaccination. Future work might consider adding other explanatory variables and include all those who professionally encounter patients, such as social workers, medical technicians, janitors, etc.

CONCLUSION

The results of this study show that regardless of job type, male and older health professionals (physicians and nurses) were more supportive of mandatory COVID-19 vaccination than their younger and female counterparts. Increasing the number of fully vaccinated healthcare workers is likely to shorten the time required to reach herd immunity, which would contribute to eradicating COVID-19. This also means that the healthcare personnel themselves, their families, and their patients would be safer.

REFERENCES

1. Taylor S, Asmundson GJ. Negative attitudes about facemasks during the COVID-19 pandemic: the dual importance of perceived ineffectiveness and psychological reactance. PLoS One 2021 Feb;16(2):e0246317.

2. Kaiser Family Foundation. [cited 2021 Dec 8]. Available from: https://www.kff.org/coronavirus-covid-19/poll-finding/kff-covid-19-vaccine-monitor-october-2021/.

3. Paul KT, Eberl JM, Partheymüller J. Policy-relevant attitudes toward COVID-19 vaccination: associations with demography, health risk, and social and political factors. Front Public Health 2021 Jul;9:671896.

4. Gagneux-Brunon A, Botelho-Nevers E, Bonneton M, Peretti-Watel P, Verger P, Launay O, et al. Public opinion on a mandatory COVID-19 vaccination policy in France: a cross-sectional survey. Clin Microbiol Infect 2022 Mar;28(3):433-439.

5. Navarre C, Roy P, Ledochowski S, Fabre M, Esparcieux A, Issartel B, et al. Determinants of COVID-19 vaccine hesitancy in French hospitals. Infect Dis Now 2021 Nov;51(8):647-653.

6. Hornsey MJ, Chapman CM, Alvarez B, Bentley S, Casara BG, Crimston CR, et al. To what extent are conspiracy theorists concerned for self versus others? A COVID-19 test case. Eur J Soc Psychol 2021 Feb.

7. Kossowska M, Szwed P, Czarnek G. Ideology shapes trust in scientists and attitudes towards vaccines during the COVID-19 pandemic. Group Process Intergroup Relat 2021;24(5):720-737.

8. Kreps SE, Goldfarb JL, Brownstein JS, Kriner DL. The Relationship between US adults' misconceptions about COVID-19 vaccines and vaccination preferences. Vaccines (Basel) 2021 Aug;9(8):901.

9. Ashwell D, Cullinane J, Croucher S. Vaccine hesitancy and support for employer vaccine mandates. Front Commun (Lausanne) 2021;6.

10. Riccò M, Ferraro P, Peruzzi S, Balzarini F, Ranzieri S. Mandate or not mandate: knowledge, attitudes, and practices of Italian occupational physicians towards SARS-COV-2 immunization at the beginning of vaccination campaign. Vaccines (Basel) 2021 Aug;9(8):889.

11. Graeber D, Schmidt-Petri C, Schröder C. Attitudes on voluntary and mandatory vaccination against COVID-19: evidence from Germany. PLoS One 2021 May;16(5):e0248372.

12. Tabachnick BG, Fidell LS. Using multivariate statistics. 7th ed. Pearson/Allyn & Bacon; 2007.

13. Hawlader MD, Rahman ML, Nazir A, Ara T, Haque MM, Saha S, et al. COVID-19 vaccine acceptance in South Asia: a multi-country study. Int J Infect Dis 2022 Jan;114:1-10.

14. Wang Q, Yang L, Jin H, Lin L. Vaccination against COVID-19: a systematic review and meta-analysis of acceptability and its predictors. Prev Med 2021 Sep;150:106694.

15. Joshi A, Kaur M, Kaur R, Grover A, Nash D, El-Mohandes A. Predictors of COVID-19 vaccine acceptance, intention, and hesitancy: a scoping review. Front Public Health 2021 Aug;9:698111.

16. Shekhar R, Sheikh AB, Upadhyay S, Singh M, Kottewar S, Mir H, et al. COVID-19 vaccine acceptance among health care workers in the United States. Vaccines (Basel) 2021 Feb;9(2):119.

17. Latkin CA, Dayton L, Yi G, Konstantopoulos A, Boodram B. Trust in a COVID-19 vaccine in the U.S.: a social-ecological perspective. Soc Sci Med 2021 Feb;270:113684.

18. Pal S, Shekhar R, Kottewar S, Upadhyay S, Singh M, Pathak D, et al. COVID-19 vaccine hesitancy and attitude toward booster doses among US healthcare workers. Vaccines (Basel) 2021 Nov;9(11):1358.

19. Khamis F, Al Mahyijari N, Al Lawati F, Badahdah AM. The mental health of female physicians and nurses in Oman during the COVID-19 pandemic. Oman Med J 2020 Nov;35(6):e203.

20. Emanuel EJ, Skorton DJ. Mandating COVID-19 vaccination for health care workers. Ann Intern Med 2021 Sep;174(9):1308-1310

21. Korn L, Böhm R, Meier NW, Betsch C. Vaccination as a social contract. Proc Natl Acad Sci U S A 2020 Jun;117(26):14890-14899.