

Knowledge and attitudes toward COVID-19 vaccination among student nurses from Saudi Arabia

Romeo Mostoles Jr. ^{1,*} , Richard Maestrado ¹ , Joyce Buta ¹ , Hamdan Mohammad Albaqawi ¹ , Evalynne Rondilla ¹ , Salman Alsaqri ¹ , Sandro Villareal ¹ 

¹ College of Nursing, University of Hail, Hail, Saudi Arabia

*Correspondence: Romeo Mostoles Jr. Address: College of Nursing, University of Hail, Hail, Saudi Arabia, Email: r.mostoles@uoh.edu.sa

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ABSTRACT

Introduction: Insights into the knowledge and attitudes of students can be achieved by analyzing their general understanding and prevention of the coronavirus. Therefore, it is imperative to identify attributes that influence the development of healthy behaviors among students. This study aimed to determine the dynamics of knowledge and attitudes of student nurses concerning the COVID-19 vaccine.

Methods: This descriptive-cross sectional study involved 250 student nurses from the University of Hail, Nursing College, selected by convenience sampling. The data were collected between August and September 2021 using questionnaires. The data were analysed using a t-test, one-way ANOVA, and Pearson’s correlation test with a significance level of 0.05.

Results: The study results showed that participants have good knowledge (mean = 3.09; SD = 0.88) and attitudes (mean = 8.62; SD = 1.83). Gender (except for knowledge), marital status, and age were not relevant as explanatory factors of knowledge and attitude. There was a significant difference in both knowledge (F = 2.233; p < 0.005) and attitude (F = 3.918; p < 0.004) associated with the course year. There was no significant relationship between knowledge and attitude (r = -0.013; p-value = 0.834).

Conclusions: This information is critical for educators as they design techniques to help students put their knowledge into practice. In this way, educators may help health students develop skills and encourage students to become accountable health professionals who can support current societal healthcare demands.

Keywords: COVID-19; demographics; intention; student nurses; vaccine

Introduction

The most effective preventive measure to reduce the pandemic is predicted to be the coronavirus disease-2019 (COVID-19) vaccination (Szmyd *et al.*, 2021), and efforts have been made to produce the vaccines, especially in developing countries (Albaqawi *et al.*, 2021). Vaccination has had a 67% acceptance rate, despite the considerable demographic and geographic differences in vaccination uptake (Malik *et al.*, 2020) due to safety concerns. It is important to note that the success of a vaccination program is determined by the vaccination uptake by the public, healthcare workers (Kassianos *et al.*, 2018), and students (e.g., nursing students), who are critical advocates of vaccination. In addition, the campus

environments of student nurses are often congested with intense movement and restricted space, i.e., environments that are considered high-risk during the COVID-19 pandemic. Therefore, nursing students also benefit from vaccination. Conversely, vaccination is a critical intervention with the potential to significantly limit the occurrence and spreading of this deadly infectious illness (Jiang *et al.*, 2021).

SARSCoV-2 vaccines became available at the end of 2020, and healthcare workers (HCWs) were among the first to be vaccinated in many countries (Szmyd *et al.*, 2021). Nursing students, in turn, cover inevitable shortfalls in the healthcare sector and also need vaccination as they have played a key role in the current response to the pandemic whenever possible (Fontenot *et*



al., 2021). However, university students' desire to become immunized to COVID-19 varies greatly (Jiang *et al.*, 2021), which could be the result of a lack of awareness that leads to the non-intention of being vaccinated. Indeed, safety issues and unfortunate events have been reported throughout the implementation of vaccination programs, damaging public opinion and influencing vaccination intentions (Grady and Mazzei, 2021). The resistance to COVID-19 immunization may increase the danger of pathogen transmission to the patients of healthcare workers while simultaneously reducing the chance of encouraging patients to get vaccinated (Biswas *et al.*, 2021). Indeed, this can be due to the safety of the vaccine, its efficacy, and potential side effects. Accordingly, vaccination has been explored in the literature; however scarcely concerning the dynamics of knowledge, attitudes, and practices associated with COVID-19 among student nurses as advocate partners of the healthcare professionals.

The negative views and skepticism toward COVID-19 vaccines are key obstacles to expanding global vaccination coverage (Paul *et al.*, 2021). Nursing students are partners in supporting the vaccination programs for COVID-19. Thus, it is critical to understand the knowledge, attitudes, and practices of student nurses, helping them develop mitigation solutions for the current scenario. Most studies on the preventive behavior of nursing students during the COVID-19 pandemic have shown a high level of commitment to preventive measures (Sun *et al.*, 2020). Moreover, vaccination acceptance rates among nursing students have been reported as satisfactory (Jiang *et al.*, 2021). It is significant, therefore, that deeper insights into existing students' knowledge and attitudes be achieved by analyzing their general understanding and prevention of the coronavirus. Hence, it is imperative to assist in the identification of attributes that influence the students in the development of healthy behaviors. This study aimed to determine the dynamics of knowledge and attitudes of student nurses toward the COVID-19 vaccine. To the best of our knowledge, this is the first study that explores the knowledge and attitudes of student nurses from the Hail region, Kingdom of Saudi Arabia.

Materials and Methods

Study Design

This study used the descriptive-cross sectional approach to determine the dynamics of knowledge and attitudes among student nurses concerning the COVID-19 vaccine.

Respondent

This study involved the active participation of 250 student nurses from the University of Hail, Nursing College. A non-probability sampling, specifically convenience sampling, was used. All full-time students

were invited to participate in the study, and those who did not provide consent were excluded. The researchers used convenience sampling, which means that all students were invited to participate in the study

Instrument

The questionnaire comprised two parts. The first part consisted of the demographic characteristics, which include gender, marital status, age, and course year. The second part was adapted from Islam *et al.* (2021) and had 11 items categorized as knowledge (five items) and attitudes (six items).

The knowledge items asked about the general knowledge about the COVID-19 vaccine (e.g. "Do you know about the COVID-19 vaccine?"; "Do you know about the effectiveness of the COVID-19 vaccine?") and had three possible responses (i.e., "Yes," "No" or "Don't know"). The "Yes" response was assigned a score of 1, while the "No/Don't know" responses were scored 0. The total score ranged from 0 to 5 and was calculated by adding the raw scores of the five items, with the highest score indicating increased level of knowledge of COVID-19 vaccines.

The attitude section consisted of six items (e.g., "The newly discovered COVID-19 vaccines are wise"; "The COVID vaccines are essential for us") that can be answered through a three-point Likert scale ranging from 0 to 2, where 0 = Disagree, 1 = Undecided, and 2 = Agree. The total score was determined by adding the raw scores of the six items, which ranged from 0 to 12, with a higher overall score suggesting more favorable attitudes toward the COVID-19 vaccination.

The questionnaire was subjected to content validation by three panel experts of the Hail region, Saudi Arabia. These three experts unanimously agreed on the validity of the questionnaire. The questionnaire was subsequently tested with 15 student nurses who were no longer part of the sample. Reliability results were high (0.86 for knowledge and 0.89 for attitudes).

Table 1 Demographic characteristics of the participants (N = 250)

Demographic characteristics	n	%
Age		
20-22	118	47.2
23-25	101	40.4
26-28	20	8
29 years old and above	11	4.4
Gender		
Male	124	49.6
Female	126	50.4
Marital Status		
Single	246	98.4
Married	4	1.6
Year Level		
Level 5	50	20
Level 6	50	20
Level 7	50	20
Level 8	40	16
Internship	60	24

Table 2 Differences between demographic characteristics and knowledge and attitudes of the nursing students toward COVID-19 vaccine

Demographic characteristics	Knowledge				Attitude			
	Mean	Std. Deviation	t	P-value	Mean	Std. Deviation	t	P-value
Age								
20-22	3.00	0.901	3.673	0.073	8.93	1.884	2.623	0.071
23-25	3.06	0.863			8.33	1.866		
26-28	3.70	0.732			8.10	1.252		
29 years old and above	3.09	0.700			8.90	1.300		
Gender								
Male	2.94	0.895	-2.678	0.008*	8.77	1.928	1.287	0.199
Female	3.23	0.843			8.47	1.728		
Marital Status								
Single	3.09	0.884	0.783	0.434	8.63	1.839	0.686	0.494
Married	2.75	0.500			2.66	0.456		
Year Level								
Level 5	3.03	0.920	2.233	0.005*	7.93	1.550	3.918	0.004*
Level 6	3.00	0.890			9.33	1.660		
Level 7	3.40	0.672			9.10	1.450		
Level 8	3.09	0.641			8.90	1.300		
Internship	3.32	0.701			9.90	0.850		

* < 0.05

Data Collection

The researchers invited the students to participate through classroom announcements. The students were instructed as to what the study entails, extent of their participation, and their rights as participants, before deciding whether or not to participate in the study. Informed consent forms were distributed to the willing participants thereafter. Data were collected between August and September 2021.

Data Analysis

The SPSS v.22 was used to analyze the data. The demographic data were described using frequency and percentage values. A t-test was used to identify differences between gender and marital status for knowledge and attitude, while a one-way ANOVA was employed to determine differences between age and course year. Pearson's r was used to determine the relationship between knowledge and attitudes. The significance level of 0.05 was considered for the statistical analyses.

Ethical Consideration

The Institutional Review Board of the University of Hail has approved this protocol (H-2021-067). In the conduct of human study, the researchers followed the ethical guidelines outlined in the World Medical Association Declaration of Helsinki. All participants signed a written informed consent form.

Results

The participants were generally young, with 47.2% aged between 20 and 22 years. Gender was nearly equally distributed with males comprising 49.6% of the participants and females 50.4% (Table 1). Only 1.6% of the students were married, and most belonged to an internship program (24%).

The knowledge of the student nurses was good (3.09 out of 5), and they had a good attitude (8.62 out of 12) toward the COVID-19 vaccine (Table 2). There was a significant difference in knowledge ($t = -2.678$; $p < 0.008$) between the genders of the nursing students, such that female students had better knowledge (3.23 ± 0.843) than their male colleagues (2.94 ± 0.895). However, there were no differences in attitude between genders ($t = 1.287$; $p > 0.199$). In addition, neither knowledge ($t = 0.783$; $p > 0.434$) nor attitude ($t = 0.686$; $p > 0.494$) differed regarding the marital status of the participants. Furthermore, there was no significant difference in the knowledge ($F = 3.673$; $p > 0.703$) or attitude ($F = 2.623$; $p > 0.071$) of the nursing students associated with their age.

There was a significant difference in both knowledge ($F = 2.233$; $p < 0.005$) and attitude ($F = 3.918$; $p < 0.004$) associated with the course year (Table 2). There was no significant relationship between knowledge and attitude ($r = -0.013$; $p\text{-value} = 0.834$).

Discussions

This study aimed to determine the knowledge and attitudes of student nurses toward the COVID-19 vaccine. The knowledge of the student nurses recorded in this study was good, which can be credited to their ongoing study and their active participation in disseminating preventive information. The results of this study are similar to that of an earlier study where the mean knowledge score was 2.83 out of 5 (Islam *et al.*, 2021), also showing the good attitude of the student nurses toward COVID-19 vaccination. A positive attitude is a key to containing the outbreak and increasing willingness to receive the COVID-19 vaccine. This shows the students' willingness to be vaccinated and promote vaccination within their community or among their clients. Overall, these good results concerning the knowledge and attitudes of the student nurses show the professional foundation and basic awareness of the necessity, effectiveness, and safety of the COVID-19 vaccine. One

good example to strengthen their knowledge and attitudes is for the students to be given an opportunity to disseminate the value of having the vaccine to their clients or patients during their community and hospital practice.

There was a considerable disparity in knowledge between the genders, where females had greater scores than males. Previous research shows that females have a higher notion of self-education and self-control (Cornwell, Mustard and Van Parys, 2013), and, thus, performed better than male students. Such result is comparable to an earlier study (Pasay-An *et al.*, 2021), and shows that male students need to be more educated regarding the COVID-19 vaccine to perform their task in promoting the vaccination program. It is vital to emphasize, however, the importance of considering educational needs while developing educational initiatives, regardless of demographic considerations (Pasay-An *et al.*, 2021). This will help the student nurses better grasp their roles in promoting the COVID-19 vaccine. For example, nurse educators can encourage their student nurses to volunteer, either giving vaccine or doing health education in the vaccination area.

Marital status was not associated with the knowledge and attitudes toward the COVID-19 vaccine. Al-Hanawi *et al.* (2020) also reported that the marital status of participants was not significantly associated with knowledge and attitudes. While the result is not significant, there still needs a continuous effort to include all students (regardless of marital status) in the ongoing improvement plan for vaccine information dissemination. For example, offering and giving them an educational session and educational outreach materials to raise their public understanding on the value of vaccine to combat the disease. Meanwhile, there were also no significant differences in the knowledge and attitude among the nursing students of different ages. However, age was previously reported as an indicator of knowledge and attitudes toward the COVID-19 vaccine (Al-Hanawi *et al.*, 2020; Pasay-an, Magwilang and Pangket, 2020). A significant difference in knowledge and attitude was recorded regarding the course year, which agrees with the findings of Kumar, Pinky and Nurudden (2021) and indicates that students needed an educational program created for their specific needs.

Apparently, knowledge and attitudes are not related to one another, which agrees (Pasay-An *et al.*, 2021) and disagrees (Al-Hanawi *et al.*, 2020) with previous findings. This study found no significant connections between knowledge and attitudes concerning COVID-19, which implies that information does not necessarily convert into attitudes and/or behaviors, and that behaviors do not transcend into attitudes. One possible explanation is that student nurses have only recently learned about the vaccination and are currently making it work in their perspectives. In contrast, Erfani *et al.* (2020) discovered that increased knowledge of COVID-19 was associated

with positive attitudes and excellent practices, suggesting that good knowledge leads to positive attitudes and good practices. In context, in developing the policy, the policy makers should consider that individual knowledge and attitudes are utilized to appraise events and their potential, as well as their repercussions.

Despite the fact that this study was conducted in a local context and the results are not generalizable, the findings are nevertheless relevant in the global arena. International policy makers, for example, can use the data from this study to plan certain initiatives based on the similar features found in this study. Furthermore, the data in this study can be utilized to evaluate and compare to data from other countries in reducing the gap on this topic.

Policy implication

This research has substantial policy implications. With the findings, policy makers in a university institution can adjust the instructional intervention to the vaccine's information drive. Moreover, this study contributes to the identification of relevant communication networks for the target demographic as part of the preventative program strategy. As a result, school or university officials can focus their efforts on programs geared at minimizing the spread of misinformation and conspiracy theories about the COVID-19 vaccine. Furthermore, the university has the ability to take unprecedented efforts and respond quickly in establishing tight control and preventative measures against COVID-19 to safeguard student safety.

Strengths and weakness of the study

This study targeting the knowledge and attitudes toward COVID-19 vaccination among the student nurses provides a useful tool for gauging vaccine acceptability. In addition, it provides the policy makers with relevant recommendations. However, it has substantial limitations. For example, the study was conducted in one setting and the use of non-probability sampling means it may not be possible to generalize. Also, the non-inclusion of practice of students in the study can be more explored as the researchers failed to do so.

Conclusions

Student nurses have a good knowledge and attitude toward the COVID-19 vaccine, and female students are more knowledgeable. Knowledge and attitude did not differ significantly between gender (except for knowledge), marital status, and ages. Lastly, a significant difference in knowledge and attitude was recorded for course year. This information is critical for educators as they design techniques to help students put their

knowledge into practice. Indeed, in this way educators may help health students develop skills and encourage them to become accountable health professionals who can support current societal healthcare demands.

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