Knowledge, Attitude, and Perception of Community Pharmacists on COVID-19 Vaccine

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Received October 21, 2021; Revised December 31, 2021; Accepted January 17, 2022

Cite This Paper in the following Citation Styles

(a): [1] Ahmed M Ashour , "Knowledge, Attitude, and Perception of Community Pharmacists on COVID-19 Vaccine," *Universal Journal of Public Health*, Vol. 10, No. 1, pp. 62 - 69, 2022. DOI: 10.13189/ujph.2022.100107.

(b): Ahmed M Ashour (2022). Knowledge, Attitude, and Perception of Community Pharmacists on COVID-19 Vaccine. *Universal Journal of Public Health*, 10(1), 62 - 69. DOI: 10.13189/ujph.2022.100107.

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Abstract Background: In the past few years, knowledge of COVID-19, its management, patients' care, and its learning curve have been challenging for the professionals in charge of managing the pandemic. Since community pharmacists were the important health care providers who remained the first point of contact during the pandemic, they played a pivotal role in providing counselling services, care, support, and infection control to the public. COVID-19 vaccine remained an important public health measure in curbing COVID-19. Despite its effectiveness in preventing the spread of the disease, a large proportion of the population is unwilling to be vaccinated owing to the lack of adequate knowledge regarding its effectiveness. **Purpose:** The present study aimed to investigate the perception, attitude, and knowledge of community pharmacists regarding the COVID-19 vaccine. **Methods:** A cross-sectional survey was conducted using questionnaires to collect data from the community pharmacists in Saudi Arabia. The questionnaire is comprised of four sections: socio-demographic, knowledge, attitude, and practices. **Results:** Most of the respondents were young adults between the ages of 23 and 34 years (73.0%). The study had more male participants (89.4%) than female participants (10.6%). Most of the male respondents were non-Saudi nationals (77.9%). The overall percentage of positive responses to the perception questions was 29.9%. The overall percentage of positive responses to the attitude questions was 21.2%. The overall percentage of positive responses to the knowledge questions was 57.4%. No significant difference is recorded between the respondents' intention on taking the vaccine and the age groups ($\chi^2(9) = 7.134$, $p > 0.05 = 0.623$). However, the remaining

characteristics of the test showed significant differences.

Conclusion: The findings confirmed that the level of knowledge regarding the COVID-19 vaccine amongst the community pharmacists was high enough to offer reliable advice to patients. However, less than 50% of the participants had adequate knowledge of the vaccine.

Keywords COVID-19, Pharmacists, Vaccine, Knowledge, Perception

1. Introduction

Over the past year, the knowledge and attitude towards management of COVID-19 and patients' care have been challenging for healthcare professionals owing to social distancing and other preventive measures put in place during the pandemic [1]. However, the launching of COVID-19 vaccines makes most activities return to normal. At present, vaccines have been rolled out by several authorized international bodies. While these vaccines have been certified as safe and effective by most regulatory bodies and are currently being distributed globally to curb the widespread of COVID-19 [2], several challenges are remarked regarding evaluating the efficacy of the vaccines. In the wave of the pandemic, other variants of the virus have been emerged, which cause a lot of concerns to health care professionals [3].

With the outbreak of the COVID -19 pandemic, the healthcare system of different countries enacted an effective plan to cope with the disease. Pharmacists remain an important part of these healthcare systems and play a vital role in the management of pandemics [3, 4, 5]. In most

countries, the current lockdown status made many pharmaceutical stores remain close, and only a few pharmacies especially community pharmacists remained open to offer public service. The community pharmacists were the important health care providers and remained the first point of contact to satisfy the community health needs during the pandemic [6].

The first case of COVID-19 was reported in Saudi Arabia on March 2, 2020 [7]. Several countries especially the Saudi community were flooded with a wave of unreliable information from different sources, especially from social media [8]. Thus, the low level of knowledge could be a block in preventing the spread of COVID-19. The greater the knowledge, the more in diffusing reliable information to prevent the spread of the virus.

Vaccines remained important public health measures in curbing COVID-19. Despite the effectiveness of COVID-19 vaccines in preventing the spread of the disease, a large proportion of the population are unwilling to be vaccinated [9]. Lack of adequate knowledge regarding the efficacy of the vaccine contributed to the unwillingness of the population to take the vaccine. Pharmacists play a vital role in providing reliable information, offering counseling services, care, support, and infection control during the pandemic. The effective role of pharmacists in limiting the spread of the COVID-19 has been emphasized by the (International Pharmaceutical Federation, 2020). As the primary contact with the local population, community pharmacists remain the most reliable source of information for concerned individuals needing advice regarding any ailment [10]. Community pharmacists facilitated information flow about the virus and its vaccines. In different countries, community pharmacists play a central role in controlling and preventing COVID-19. Thus, policymakers must provide better support for this healthcare professional system to improve patient care.

Understanding the level of knowledge and attitude regarding the COVID-19 vaccine among community pharmacists could help in containing the pandemic. The experiences gained from the initial SARS (severe acute respiratory syndrome) outbreak in 2002 revealed that knowledge and attitude towards contagious infections could contain the panic of the general public [11]. This panic also affects the chances of the healthcare system to inhibit infection transmission and a virus outbreak.

The present study aimed to explore the knowledge, perception, and attitude of pharmacists about the COVID-19 vaccine in Saudi Arabia. The findings of this study will assist in providing valid information regarding the COVID-19 vaccine and developing the corrective measures in curbing the spread of the COVID-19.

2. Materials and Methods

2.1. Design

A cross-sectional survey was conducted by offering

questionnaires to community pharmacists across Saudi Arabia. Data were collected during the peak of the COVID-19 pandemic between January 2021 and May 2021. Since no immediate data was available regarding the total number of community pharmacists working in the country during the pandemic, no sampling frame was produced, and a convenience sampling model was used to select the participants. Community licensed pharmacies were enrolled on the survey by sending questionnaires to them online at their respective locations. The selected participants were only the community pharmacies in Saudi Arabia.

The questionnaire comprised of four sections: the socio-demographic section, the knowledge, attitude, and practices section. The questionnaire was critically appraised by independent experts to determine face validity. Additionally, an analysis of the internal consistency of each section was conducted by employing a pilot study of 50 samples. An acceptance criterion was set for a Cronbach alpha score of 0.6, in which all questions meeting this criterion were included in the final version of the document.

2.2. Statistical Approach

The data collected from the questionnaires were analyzed using the statistical package for social studies (SPSS version 20.0), and the completeness and accuracy of the data collected from participants were checked. The demographic characteristics of the respondents were generated using the software's descriptive statistic command. Frequency and percentage were used in the characterization of the knowledge, attitude, and practices of the participants concerning COVID-19.

Ethics

Ethical approval was obtained from the ethical committee at Umm AlQura University, Saudi Arabia. All guidelines outlined in the Declaration of Helsinki were adhered to by the research group. Dissemination of the questionnaire was conducted via an online platform owing to strict lockdown protocol. The online questionnaire was prepared with a pre-face that outlined the nature and purpose of the study. In addition, the pre-face included a consent section that guaranteed anonymity and voluntary participation of the respondents.

3. Results

3.1. Socio-Demographic Analysis

A total of 1670 community pharmacists were involved in the survey. Of these, 345 were not fully completed, producing a non-response rate of 24.4%. Most of the respondents were young adults between 23 and 34 years

(73.0%) of age, with very few participants nearing their retirement age, 55 to 60 years (0.6%). The study had more male participants (89.4%) than female participants (10.6%). Most of the male respondents were Saudi nationals (77.9%). Most of the respondents resided in a city, from the western region (42.2%). However, few respondents were

from the eastern region (8.1%). Most of the respondents reported had a Bachelor's degree (83.6%) and worked as pharmacists (70.8%) with very few reported to be under a fellowship or residency program (0.2%) and be technicians (0.8%). Most of the respondents (36.9%) have between 6 and 10 years of experience in their current field (Table 1).

Table 1. Socio-demographic analysis of 1670 community pharmacists in Saudi Arabia

Variable	Category	Percent
Age	23 – 34 years	73.0
	35 – 44 years	23.0
	45 – 54 years	3.3
	55 – 60 years	0.6
Gender	Male	89.4
	Female	10.6
Nationality	Non-Saudi	77.9
	Saudi	22.1
Marital status	Divorced	0.9
	Married	74.4
	Single	24.3
	Widowed	0.4
Residence	In a city	91.7
	In a village	8.3
Region	Central	20.3
	Eastern	8.1
	Northern	11.5
	Southern	17.9
	Western	42.2
Education	Bachelor	83.6
	Diploma	1.1
	Fellowship or residency program	0.2
	Master	1.8
	Pham D	12.8
	PhD	0.5
Job	Consultant pharmacist	3.0
	Pharmacist	70.8
	Senior pharmacist	25.4
	Technician	0.8
Years in service	< 2 years	15.7
	2 – 5 years	19.0
	6 – 10 years	36.9
	> 10 years	28.4

Table 5. Groups of individuals who influence the community pharmacists' decision to take the vaccine

	Frequency	Valid Percent
Technician	368	22
Pharmacist	337	20.2
Pharmacist, Senior pharmacist, Consultant pharmacist	244	14.6
Technician, Pharmacist	92	5.5
Senior pharmacist, Consultant pharmacist	71	4.3
Senior pharmacist	55	3.3
Pharmacist, Senior pharmacist	53	3.2
Consultant pharmacist	39	2.3
Technician, Pharmacist, Senior pharmacist, Consultant pharmacist	30	1.8
Pharmacist, Consultant pharmacist	14	0.8
Technician, Pharmacist, Senior pharmacist	6	0.4
Technician, Consultant pharmacist	3	0.2
Technician, Senior pharmacist	4	0.2

A total of 5.6% of the respondent claimed that non-supportive policies were to blame for the low uptake of the vaccine (Table 6). However, 3.7% of the participants

reported that patients were unwilling to use pharmacy services as the main deterrent from vaccine uptake in their areas.

Some respondents (15%) indicated they trusted none of the sources regarding the COVID-19 vaccine (Table 7). Other sources were the most trusted source of information regarding the COVID-19 vaccine (14.9%). A total of 10% of the respondents trusted the Internet more than social media to source reliable information regarding the vaccine. Other media outlets such as newspapers, magazines, radio, television, and social media only gained the trust of 1.1% of the respondents as a reliable source of information for the vaccine.

A total of 33.4% of the respondents indicated they preferred to source their information from two groups: the Ministry of Health and the World Health Organization (WHO). However, 13.5% of the respondents preferred a combination of the Saudi Ministry of Health, the WHO, and doctors to source information about the COVID-19 vaccine (Table 8). A total of 11.9% of the sample pharmacists preferred the Ministry of Health as their primary source of information for the COVID-19 vaccine. On the other hand, only 2.3% of the sample preferred to obtain information on the COVID-19 vaccine from other sources.

Table 6. Reasons for low uptake of the COVID-19 vaccine

	Frequency	Valid Percent
Time	218	13.1
Lack of knowledge and skills	93	5.6
Non-supportive policies	73	4.4
Non-supportive policies, Time	61	3.7
Patients' unwillingness to use pharmacy services	57	3.4
Shortages in numbers of community pharmacists, Time	55	3.3
Lack of knowledge and skills, Time	47	2.8
Non-supportive policies, Shortages in numbers of community pharmacists, Time	37	2.2
Lack of knowledge and skills, Lack of confidence and good training, Non-supportive policies, Patients do not trust community pharmacists, Patients' unwillingness to use pharmacy services, Shortages in numbers of community pharmacists, Time	31	1.9
Lack of knowledge and skills, Lack of confidence and good training, Time	32	1.9
Patients' unwillingness to use pharmacy services, Time	32	1.9
Shortages in numbers of community pharmacists	31	1.9
Lack of knowledge and skills, Lack of confidence and good training	28	1.7
Lack of knowledge and skills, Non-supportive policies	23	1.4
Lack of knowledge and skills, Non-supportive policies, Time	24	1.4
Lack of confidence and good training	22	1.3
Lack of knowledge and skills, Lack of confidence and good training, Non-supportive policies	22	1.3
Non-supportive policies, Patients' unwillingness to use pharmacy services	19	1.1
Patients' unwillingness to use pharmacy services, Shortages in numbers of community pharmacists, Time	18	1.1
Lack of confidence and good training, Non-supportive policies	16	1
Non-supportive policies, Patients' unwillingness to use pharmacy services, Time	17	1
Patients do not trust community pharmacists	16	1

Table 7. Trusted sources for information about COVID-19 vaccine

	Frequency	Valid Percent
None of the trusted sources	251	15.0
Other sources	248	14.9
Internet (not social media)	167	10.0
Social media	103	6.2
Internet (not social media), Other sources	74	4.4
Newspapers and magazines	54	3.2
Social media, Internet (not social media)	54	3.2
Radio and television	44	2.6
Radio and television, Social media	34	2.0
Newspapers and magazines, radio and television	30	1.8
Newspapers and magazines, Internet (not social media)	26	1.6
Other sources, None of these sources I trust	27	1.6
Social media, Other sources	24	1.4
Newspapers and magazines, Social media	21	1.3
Newspapers and magazines, radio and television, Social media	18	1.1
Radio and television, Internet (not social media)	18	1.1

Table 8. Preferred sources of information regarding COVID-19 vaccine

	Frequency	Valid Percent
Saudi Ministry of Health, World Health Organization	557	33.4
Saudi Ministry of Health, World Health Organization, The doctors	225	13.5
Saudi Ministry of Health	198	11.9
World Health Organization	79	4.7
Ministry of Health, The doctors	42	2.5
Other	38	2.3
The doctors	25	1.5
Ministry of Health, World Health Organization, Other	19	1.1
World Health Organization, The doctors	19	1.1
Ministry of Health, World Health Organization, The doctors, Other	16	1

3.6. Inferential Statistics

The chi-square was used to compare the participants' characteristics with their intention to take the emerging COVID-19 vaccine. No significant difference was observed between the respondents' intention to take the vaccine and the age groups ($\chi^2 (9) = 7.134$, $p > 0.05 = 0.623$). For the remaining characteristics, the test showed significant differences. Significant difference was observed between the genders ($\chi^2 (3) = 36.704$, $p > 0.05 = 0.001$), nationality ($\chi^2 (3) = 68.836$, $p > 0.05 = 0.001$), marital status ($\chi^2 (9) = 26.672$, $p > 0.05 = 0.002$), residency ($\chi^2 (3) = 12.402$, $p > 0.05 = 0.006$), region ($\chi^2 (12) = 35.528$, $p > 0.05 = 0.001$), education ($\chi^2 (15) = 57.723$, $p > 0.05 = 0.001$), profession ($\chi^2 (9) = 37.174$, $p > 0.05 = 0.001$), and years of experience ($\chi^2 (9) = 28.744$, $p > 0.05 = 0.001$).

Table 9. Comparing the participants' characteristics with their intention to take the emerging COVID-19 vaccine

Variable	Chi-square	df	P (2 sided)
Age	7.134	9	0.623
Gender	36.704	3	0.001
Nationality	68.836	3	0.001
Marital status	26.672	9	0.002
Residency	12.402	3	0.006
Region	35.528	12	0.001
Education	57.723	15	0.001
Profession	37.174	9	0.001
Years of experience	28.744	9	0.001

4. Discussion

All the respondents acknowledged having knowledge of the COVID-19 virus and vaccine. Most of the respondents did not trust the sources of information in the questionnaire as reliable information regarding the COVID-19 vaccine (15%). However, most respondents trusted sources of information regarding the Coronavirus vaccine apart from the sources from newspapers, magazines, radio, television, social media, and internet sources other than social media (14.9%). These findings were contrary to that of other studies. Three different studies showed that most health workers relied on government websites, news media, and social media as their main source of information for COVID-19 [12, 13]. Although other studies indicated the Internet and social media serve as an important source of information for health workers regarding COVID-19. However, community pharmacists in Saudi Arabia find these sources to be unreliable, and only trusted government websites and traditional media serve as the accurate sources of information for the virus and its vaccine. Therefore community pharmacists in Saudi Arabia are sceptical and keen on verifying information to relay to the general public.

Community pharmacists interviewed have the knowledge of the primary cause of COVID-19 and the biological system it attacks. Community pharmacists also have deep knowledge about the people not supposed to take the COVID-19 vaccine. Similarly, a higher percentage revealed correct responses to knowledge questions regarding the negative effects of the vaccine, the opinion of different health organizations regarding the vaccine, and the different types of vaccines available to the public. Contrarily, other studies found lower percentages of correct responses to knowledge questions regarding different aspects of COVID-19 on health workers [12]. Differences in the study population are associated with the differences in the results between the studies. While these studies [12] were undertaken in Saudi Arabia, other authors focused on the entire spectrum of healthcare workers. A study by Giao et al. [14] was conducted in the city of Ho Chi Minh. Additionally, the differences may be associated with methodology and the time of data collection. Information regarding the COVID-19 and its vaccine is released weekly if not daily basis. As such, community workers are more likely to have significant differences in knowledge regarding the vaccine. Despite the high percentages of positive responses on knowledge questions, the sampled community pharmacists had less adequate knowledge for the two questions: The question about knowledge on the steps taken to test the effectiveness of the COVID-19 vaccine (48.3%) and that of the steps taken to test the safety of the COVID-19 vaccine (47.2%) were average. The implication was that more than half of the pharmacists were misinformed about the vaccine. All community pharmacists should be well informed about the vaccine to assist them in acting as the primary source of

reliable information regarding the COVID-19 vaccine.

5. Conclusions

The findings confirmed that the level of knowledge regarding the COVID-19 vaccine amongst the community pharmacists is high enough to provide reliable advice to the patients. However, in some aspects, less than half of the participants had adequate knowledge regarding the vaccine. A very small percentage of the sampled population held the view of the COVID-19, and one-third of the respondents had the view that the vaccine had not been sufficiently tested on human subjects. The community pharmacists' perception of the COVID-19 vaccine is positive on the level of its negative effect on the patients and the intentions of pharmaceutical firms in increasing their profit margin. The respondents' perception of the reliability of the healthcare system in safeguarding the safety of the vaccine was not entirely positive as almost half of the participants did not trust the healthcare system to handle the job effectively.

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