THE EUROPEAN SOCIETY OF MEDICINE

Medical Research Archives. Volume 12 Issue 7

RESEARCH ARTICLE

COVID-19 Vaccine Motivation, Willingness and Hesitancy of Health Majors University Students in Palestine

Farid Ghrayeb[1], Ayesha AlRifai*[2], Reem Abu Hweij[3]

[1] Faculty of Health Professions, Al-Quds University, Jerusalem 51000, Palestine
[2] Institute of Community and Public Health, Birzeit University Ramallah, Palestine
[3] Private Practice Psychotherapist and Research Consultant

OPEN ACCESS

PUBLISHED
31 July 2024

CITATION
Ghrayeb, F., AlRifai, A., et al., 2024.. COVID-19 Vaccine Motivation, Willingness and Hesitancy of Health Majors University Students in Palestine. Medical Research Archives, [online] 12(7). https://doi.org/10.18103/mra.v12i7.5429

DOI
https://doi.org/10.18103/mra.v12i7.5429

ISSN
2375-1924

ABSTRACT

Background: The effectiveness of the COVID-19 vaccination campaign hinges on the motivation and willingness of the general population to be vaccinated. The purpose of this research was to determine the motivation, willingness, and hesitancy of Al-Quds University students enrolled in health majors to get the COVID-19 vaccine, as well as to detect their attitude toward COVID-19 vaccine.

Methods: A cross-sectional study design was employed to target students in health majors at Al-Quds University during the first semester of 2023–2024, using a proportionate sample stratified by specialization and educational level. A self-reported questionnaire consisted of five main sections: sociodemographic details, information on attitudes and beliefs about COVID-19, attitudes and beliefs about COVID-19 vaccination, degree of willingness and hesitancy for COVID-19 vaccine, and lastly, sources of knowledge regarding COVID-19 vaccine. A linear logistic regression was performed to investigate associations between willingness and hesitancy to be vaccinated for COVID-19 and sociodemographic factors.

Results: 66.1% of participants reported being very likely to get vaccinated against COVID-19, 22.8% were unsure, and 11.1% reported being very unlikely to be vaccinated. The major reason for vaccination hesitancy was insecurity due to the rapid development of the vaccine, concerns about COVID-19 vaccination, fear of needles, and distrust in vaccine against mutation. Whereas the essential reasons for vaccination motivation and acceptance ranged from fear of being infected with Covid-19, the desire to get back to normal life, and fear of transmitting the infection to family and others. Additionally, TV and radio were the main source of information regarding COVID-19 vaccination.

Conclusion: This study showed a high reluctant level among university students in health majors against COVID-19 vaccines. Providing correct information to the public through independent health organizations that are not associated with the ruling authority, particularly to university students, on the safety and effectiveness of COVID-19 vaccines is highly recommended.

Keywords: Hesitancy; motivation, attitudes; willingness; vaccine; COVID-19

1. Introduction

Major public health effects of the COVID-19 pandemic have been seen across all spheres, including the individual, local community, national, and global levels[1]. To stop the coronavirus from spreading throughout their areas, governmental public health departments have issued rules and suggestions across various mediums. The introduction of COVID-19 vaccinations was one of the universal steps; nonetheless, vaccine hesitancy has been documented worldwide, with cases occurring in more than 90% of countries[2] studied. This hesitation persists even though immunization is crucial in reducing the virus's transmission, and has helped to eradicate, contain, or control infectious diseases all over the world[3]. Although Coronavirus disease (COVID-19) was proclaimed as a global pandemic by World Health Organization (WHO) in 2019, and vaccination services have been made available across most nations, some people remain hesitant to follow the advised vaccination regimen. This vaccine hesitancy is becoming a major concern, and was listed as one of the top 10 global health hazards for 2019 by the World Health Organization[4]. Misinformation and vaccination skepticism severely impede herd immunity[5,6]. The adoption of a COVID-19 vaccination might be greatly impacted by false information distributed via a variety of ways[7]. A previous study in Palestine showed that fear of adverse effects from the vaccine and inadequate appropriate information were considered primary barriers to vaccination[8]. Unfortunately, these barriers do not only exist in smaller sub-populations but have in fact been identified as beliefs held by individuals working in the healthcare field such as medical professionals and nurses, especially those who had no exposure to COVID-19 patients[9]. Research in public health and medicine has been conducted across several countries worldwide to identify the negative attitudes and perceptions held by populations towards the COVID-19 vaccine.

According to Price and colleagues, individuals who are college educated, people living in cities, those who place more trust in information provided by authorities, and those who had greater concern for their health and the health of their kin expressed a greater readiness to receive the COVID-19 vaccination [10]. Since the pandemic outbreak, studies on the reasons why some people choose not to receive the COVID-19 vaccination have been carried out all over the world. The conviction that COVID-19 is not a serious issue, that it is a hoax, and the simple notion that they do not require the vaccination were the main justifications given by respondents in a cross-sectional survey conducted in Pakistan[11]. According to previous studies, the most prevalent reasons people refuse vaccinations were distrust of the vaccine's efficacy, safety concerns, and overall opposition to vaccinations, fear of the vaccine's side effects, myths about vaccination requirements, mistrust of the healthcare system, ignorance of vaccines and diseases, lack of knowledge on the safety and effectiveness of the vaccine, and whether the government provides the vaccine for free[12].

There may be individual differences in vaccine hesitancy. For instance, a nationwide survey conducted in Italy discovered that those who refused vaccinations were more likely to be female and to live in rural regions[13]. Furthermore, there have previously been reports of vaccination hesitancies in the Polish population that are linked to lower levels of education and living outside of cities[14]. According to a Japanese study, younger persons had greater vaccination acceptance rates, whereas females and those with less education had higher vaccination hesitation rates[15]. Acceptance of the vaccine may also vary based on whether a person has had the illness.

A study by Abu-Farha and colleagues[16] found that middle easterners were overall less likely to receive vaccination for COVID-19 than the worldwide rate, with Iraqis being the most likely to receive the vaccine and Jordanians being the least likely to accept it. In Palestine specifically, only 30% of the Palestinian population had received the COVID-19 vaccine in 2022[17]. Whereas Zawahrah and coworkers found that 63% of their Palestinian sample from West Bank and Gaza expressed a willingness to receive the COVID-19 vaccine[18], it is thus evident that there is a discrepancy in the populations' expressed willingness to get vaccinated and their follow-through on getting vaccinated. In their study on the Palestinian populations hesitancy to get vaccinated, Odah and coworkers identified misinformation, false rumors, conspiracy theories and mistrust towards the government as primary drivers for refusing vaccination. These reasons are understandable within the Palestinian context as the population resides under the violent Zionist colonial system that has bred fear, ambivalence, and mistrust within the colonized Palestinian natives in accessing healthcare services provided by the system that oppresses them or those that operate under their extension[19]. Nevertheless, the spread of COVID-19 in Palestine hasn't differed from its worldwide rate and it remains essential to identify motivational factors in increasing willingness to vaccinate among the Palestinian population.

2. Materials and Methods

2.1 STUDY DESIGN, POPULATION AND SAMPLE

A cross-sectional survey study was utilized by completing a self-administered anonymous questionnaire in Arabic. Data collection started in September and was finalized in December 2023. All participants were students in health majors at Al-Quds University, Palestine. All students were registered in the first semester of the academic year 2023/2024 in one of the following health specialties: Medicine, Dentistry, Pharmacy, Medical Laboratory Sciences, and Nursing. The ideal sample size was estimated based on the population size, with a margin of error of 3 % and a 95 % confidence interval, based on the conservative assumption that the level of acceptability of 50 %, which was calculated to be 590 students, including the added 10% nonresponse rate. A proportional stratified sampling design was employed by specialty and educational level based on the total number of students registered in each of the five health specialties. A random selection of the students from each stratum was carried out. Accordingly, participants were recruited based on the randomly identified student sample from the registration list in the same section regardless of gender differentiation. Participants were assured of the

anonymity and confidentiality of data. All participants were provided with a consent form assuring their confidentiality, asserting their right to withdraw at any point without retaliation, and clarifying that there were no incentives provided for participation. The consent form also provided them with instructions for filling out the study's questionnaire. All participants read and signed their consent forms.

2.2 INSTRUMENT AND DATA COLLECTION

A wide range of pertinent literature was used by the researchers to develop the self-reporting questionnaire. To ensure the accuracy of the translation and the consistency of the content, the closed-structured questionnaire was first created in English, translated into Arabic, and then back into English. Then, the Arabic version survey was administered in carrying out the study. Similarly, three independent experts in public health and preventative medicine reviewed the questionnaire to assure the scientific credibility, validity, accuracy, relevance, and simplicity of the included questions and statements. The questionnaire was pilot tested with 50 students from the health complex at Al-Quds University who were excluded from the original study. High reliability and acceptability were assured by calculating Cronbach's alpha from the overall domains which was equal to 0.873. The questionnaire items were divided into the following sections: (A) consisted of queries about their demographic information including age, gender, marital status, the discipline of their study, the place of residence (governorate). (B) included questions about psychological factors such as: to what extent they thought "coronavirus poses a risk to" people in Palestine and to themselves personally, on a five-point scale, from "no risk at all" to "major risk.", do you believe you have had, or currently have, coronavirus, on a five-point scale, "I have probably had it or probably have it now," "I have probably not had it and probably don't have it now," and "I have definitely not had it and definitely don't have it now." (C) participants were asked about their willingness and hesitancy to be vaccinated. (D) Participants were asked a series of statements about COVID-19 vaccination beliefs and attitudes. (E) included questions related to the sources of knowledge about the COVID-19 vaccine. Finally (F) participants were asked to state how likely they were to get a COVID-19 vaccine to measure their vaccination intention "when a coronavirus vaccination becomes available" on an eleven-point scale from "extremely unlikely" (0) to "extremely likely" (10).

2.3 DATA ANALYSIS:

The statistical program for social science (SPSS) version 25 (SPSS Inc., USA) was utilized to conduct the statistical analysis. To provide an overview of the sociodemographic characteristics of the study participants. Descriptive statistics were employed the estimate percentage of perceived vaccination acceptance, and the perceived vaccination hesitancy. The computation of mean and standard deviation (SD) was done for quantitative data. However, the qualitative data was represented using percentages and frequencies.

In order to determine the factors linked to the intention of receiving the COVID-19 immunization, we built a linear regression model. The predictors that were ordinal and multinomial were transformed into dummy variables. We performed principal component analyses on questions examining beliefs and attitudes regarding COVID-19 and a COVID-19 vaccine to facilitate model understanding and to address collinearity in some variables. There were no techniques used for variable selection; but the variables that were included in the model were chosen at random based on their theoretical significance. Personal characteristics; general vaccination beliefs and attitudes; beliefs and attitudes about COVID-19 disease; and beliefs and attitudes regarding COVID-19 vaccination were the five categories of variables that made up the model. The change in R2 attributed to a collection of dummy variables and the squared semi-partial correlation for a numerical predictor were used to compute the proportion of variation in the outcome variable explained by each predictor.

3. Results

A total of 590 out of 620 students in health majors at Al-Quds University participated in the study (response rate 95.2 %). The majority of participants were female (62.4 %; n = 368) and 30 % (n = 183), 42 % (n = 248) were of age group 22-23 yrs., 25.6 % (n = 151) were 24 years of age or above. Other sociodemographic data are presented in **Table 1.**

Table 1. Participant demographic characteristics.

Variable	Categories	n (%)
Gender	Male	222(37.4)
	Female	368(62.4)
Age-group	Between 19-21 yr.	191(32.4)
	Between 22-23 yr.	248(42.0)
	≥ 24 yrs.	151(25.6)
Specialty	Nursing	177(30.0)
	Medicine	164(27.8)
	Medical Lab sciences	120(20.3)
	Dentistry	129(21.9)
Governorate	Hebron	157(26.6)
	Bethlehem	146(24.7)
	Jerusalem	111(18.8)
	Ramallah	60(10.2)
	Jericho	31(5.3)

Variable	Categories	n (%)
	Nablus	21(3.6)
	Tulkarm	47(8.0)
	Qalqilya	17(2.9)
Number of people in household	0-2	42(7.1)
	3-4	209(35.4)
	5-6	267(45.3)
	≥ 7	72(12.2)

As shown in **Figure 1**, the most common factors that explained positive vaccination intention were fear of being infected with Covid-19, 506(85.8), desire to get back to normal life, 500(84.7), fear of transmitting the infection to my family and others, 488(82.7), the vaccine will protect me against Covid-19 and its complications, 883(81.9)., The least common factors that explained vaccination intention were that the disease is highly contagious, 423(71.7), that it is safe, with no concern about side-effect, 403(68.3), and fear of entering the isolation hospital 361(61.2).

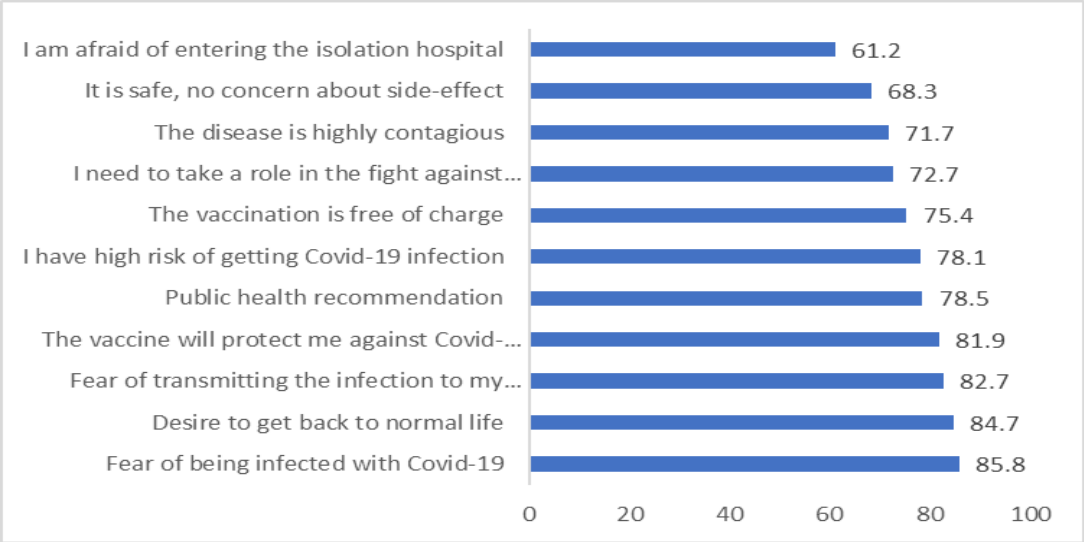

Figure 1. The willingness to receive the COVID-19 vaccine

On the other hand, **Figure 2** shows the top reasons for vaccination hesitancy which were: insecurity due to the rapid development of the vaccine, 485(82.2), concerns about COVID-19 vaccination, 471(79.8), and fear of needles 439(74.4). Whereas, the least prominent reasons for the vaccination hesitancy were belief that the COVID-19 vaccine was developed as a biological weapon, 254(43.1), the COVID-19 vaccine can cause infertility, 233(39.5), and COVID-19 is a new emerging disease and data on it are limited ,147(24.9).

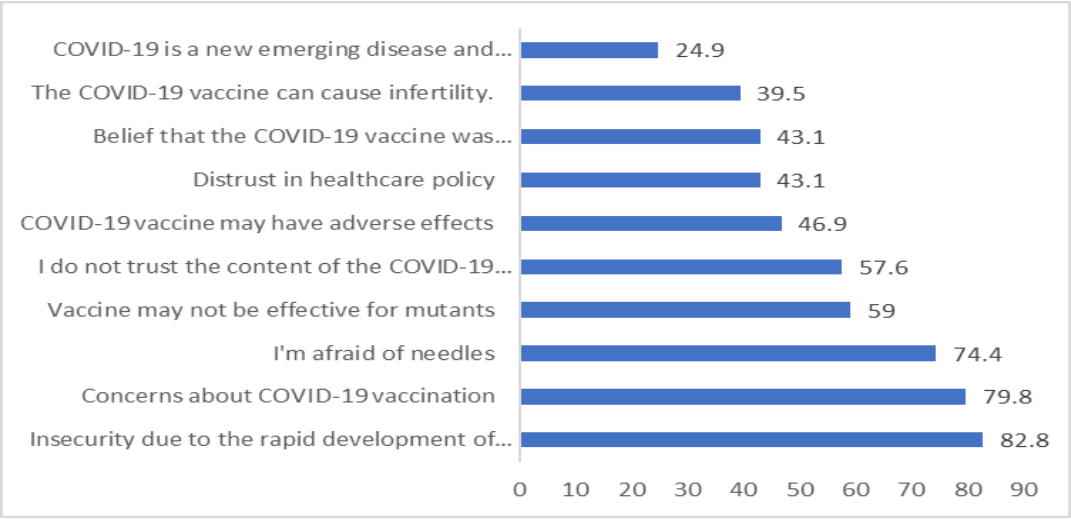

Figure 2 The top reasons for the vaccination hesitancy

Tables 2 and 3 present descriptive data for the items measuring psychological aspects. The danger that COVID-19 poses to others was viewed by participants as being higher (76.3% indicating a substantial or major risk of COVID-19 to persons in Palestine) than it is to them individually (43.9% significant or major risk). There was also strong support for the statement, "We are all responsible for reducing the spread of coronavirus. Notably, participants expressed far higher levels of faith in the NHS than in the government when it came to handling the epidemic.

Table 2. Descriptive statistics for continuous items measuring beliefs and attitudes of the university students about COVID-19 and a COVID-19 vaccination. Data are mean (Standard deviation) on a 0–10 numerical rating scale (0 = strongly disagree, 10 = strongly agree).

	Item	Mean (SD)
Attitudes and beliefs about COVID-19	I believe that coronavirus would be a mild illness for me	5.08(3.1)
	Too much fuss is being made about the risk of coronavirus	3.06(3.1)
	We are all responsible for reducing the spread of coronavirus	9.04(1.5)
	I believe I am immune to coronavirus	2.22(2.5)
	The coronavirus pandemic has had a big impact on my life	7.08(3.1)
	I trust the NHS to manage the coronavirus pandemic in Palestine	7.36(2.9)
	I trust the Government to manage the coronavirus pandemic in Palestine	3.28(3.5)
Attitudes and beliefs about a COVID-19 vaccination	A coronavirus vaccination should be mandatory for everyone who is able to have it	5.75(3.3)
	If I get a coronavirus vaccination, I will be protected against coronavirus	7.88(3.1)
	If I don't get a coronavirus vaccination and end up getting coronavirus, I would regret not getting the vaccinated	8.01(2.9)
	It would be very easy for me to have a coronavirus vaccination	7.08(3.1)
	A coronavirus vaccination could give me coronavirus	2.44(3.6)
	I might regret getting a coronavirus vaccination if I later experienced side effects from the vaccination	6.72(3.6)
	A coronavirus vaccination will be too new for me to be confident about getting vaccinated	5.05(3.8)
	Most people will get a coronavirus vaccination	6.16(3.7)
	Other people like me will get a coronavirus vaccination	8.08(2.3)
	If I were vaccinated, I think I would not need to follow social distancing and other restrictions for coronavirus	3.68(2.9)
	I know enough about the coronavirus illness to make an informed decision about whether or not to get vaccinated	7.20(3.5)
	I know enough about the coronavirus vaccine to make an informed decision about whether or not to get vaccinated	3.70(3.9)
	If a coronavirus vaccination were recommended by the Government, I would get vaccinated	5.64(4.4)
	If a coronavirus vaccination were recommended by a health care professional, I would get vaccinated	6.64(4.1)
	Widespread coronavirus vaccination is just a way to make money for vaccine manufacturers	3.46(3.1)
	When a coronavirus vaccination becomes available to you, how likely is that you will have one	7.52(3.0)

When analyzing items pertaining to beliefs and attitudes regarding COVID-19, two components emerged. The first part represented items about the "perceived threat and influence of COVID-19" pandemic, perceived immunity to the virus, and perceived severity of the virus. Whereas the second part assessed public confidence in the NHS and government's ability to control the COVID-19 pandemic in Palestine, in other words "trust in COVID-19 management". Whereas four components protruded when examining COVID-19 vaccination-related items. The first part assessed "general COVID-19 vaccination beliefs and attitudes." Items that loaded onto this factor examined perceptions of vaccine effectiveness, social norms, the chance of contracting COVID-19 without a vaccination, beliefs about mandatory vaccination, the impact of various sources' recommendations on vaccination, the likelihood of regretting not getting vaccinated, and the perceived ease of vaccination. The second part, dubbed "COVID-19 vaccination adverse effects," assessed how the vaccine's novelty and perceived side effects were perceived. The third part assessed "perceived knowledge sufficiency," or the amount of information one felt they needed to make an educated vaccination decision. The fourth part, "return to "normal" life," contains information on vaccinations permitting a return to "normal" life and removing the need to observe social distance and other restrictions.

Table 3. Descriptive statistics for categorical and ordinal items measuring beliefs and attitudes about COVID-19 and a COVID-19 vaccination.

Item	Level	n (%)
To what extent do you think coronavirus poses a risk to people in Palestine?	No risk at all	3(.5)
	Minor risk	19(3.2)
	Moderate risk	116(19.7)
	Significant risk	237(40.2)
	Major risk	213(36.1)
	Don't know	2(.3)
To what extent do you think coronavirus poses a risk to you personally?	No risk at all	3(.5)
	Minor risk	147(24.9)

	Moderate risk	179(30.3)
	Significant risk	156(26.4)
	Major risk	103(17.5)
	Don't know	2(.3)
Do you believe you have had, or currently have, coronavirus?	Definitely not	95(16.1)
	Probably not	206(34.9)
	Probably	171(29.0)
	Definitely	26(4.4)
	Don't know	92(15.6)
Do you personally know anyone (excluding yourself) who has had coronavirus?	Yes	343(58.1)
	No	3(.5)
	Don't know	237(40.2)
	Prefer not to say	7(1.2)
As far as you know, is there currently a widely available vaccination to protect against coronavirus?	Yes	37(6.3)
	No	538(91.2)
	Don't know	13(2.2)
	Prefer not to say	2(.3)

As shown in **Figure 3**, vaccination intention exhibited a marked negative skew (mean = 7.52, standard deviation = 2.1, median = 9). In order to categorize respondents in terms of their vaccination intention, we applied a priori cut-points to the 0–10 scale (with scores of zero to two as "very unlikely," three to seven as "uncertain" and eight to ten as "very likely"), 11.2% reported being very unlikely to be vaccinated (n = 66), 22.7% reported being uncertain about their likelihood of vaccination (n = 134), and 66.1% reported being very likely to be vaccinated (n = 390).

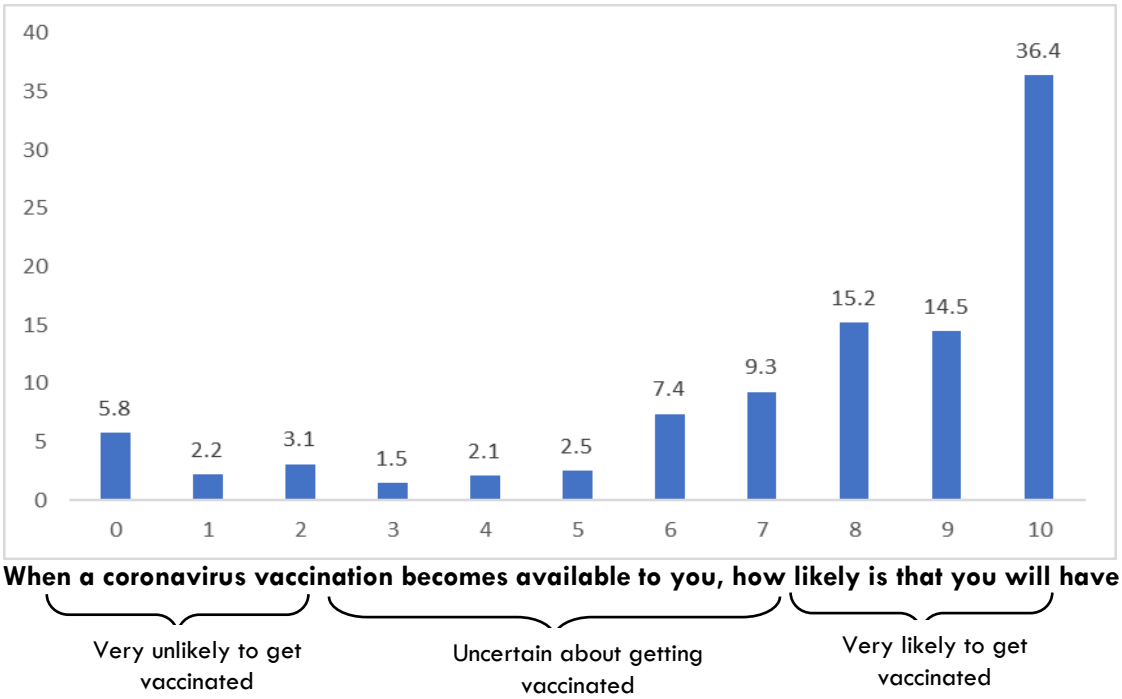

Figure 3. Perceived likelihood of having a vaccination (0 = "extremely unlikely" to 10 = "extremely likely"). The figure also shows cut-points that we used to categorize respondents in terms of their vaccination intention (into three categories of very unlikely, uncertain, and very likely to be vaccinated).

Table 4. presents the results of linear logistic regression analysis. Reading the adjusted odds ratio (AOR), The regression model showed that being a female was the only predictor attributed to having had -.088 (95%CI: -.153, -.024; p:0.007) times the odds of willingness to receive the COVID-19 vaccine, and more likely -.079 times to have a low intention to refuse receiving the COVID-19 vaccine (95%CI: -.139, -.019; p: 0.010) in comparison to male students.

Table 4. Modeling regression analysis between willingness and the perceived challenges to receive the COVID-19 vaccine with the sociodemographic characteristics of the participants (n=590)

Variables	**Willingness**			**Challenges**		
	AOR	95% CI	*p*-value	AOR	95% CI	*p*-value
Gender	-.088	-.153, -.024	.007	-.079	-.139, -.019	.010
Age-group	.032	-.007, .071	.102	.009	-.027, .045	.634
College	-.009	-.029, .011	.282	.008	-.011, .026	.308
Governorate	.002	-.014, .019	.852	-.009	-.025, .007	.307

***AOR**: Adjusted Odds ratio*

Fig. 4 presents the main sources of information about COVID-19 vaccination among university students. When students were asked about the trusted source of information related to the COVID-19 vaccine, around 94.7% of the respondents have reported that doctors and professors at the colleges were the main sources of information. Other sources were found such as local and international satellite channels (81.0%), social media (79.3%), and local radio (71.4%).

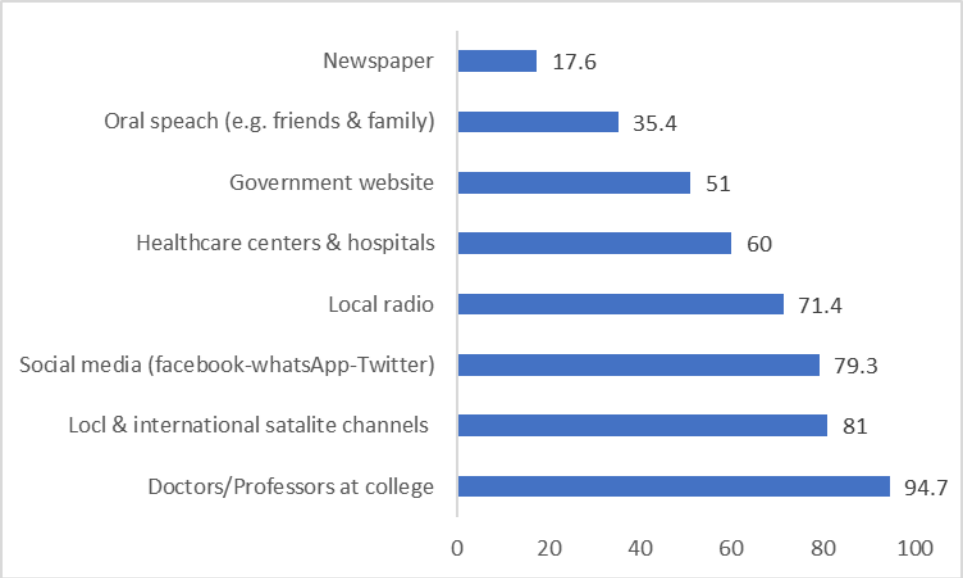

Figure 4. Sources of information about COVID-19 vaccine among university students.

4. Discussion

Availability of COVID-19 vaccine to the general population is vital for increasing vaccination rate and achieving herd immunity against the pandemic. Herd immunity and vaccination estimations are dynamic fields of study with fast evolving data. Although some studies show that up to 60% of the population may require vaccinations to accomplish herd immunity, current research indicates that this number may be significantly lower based on variations in demographic factors, like susceptibility and exposure[20]. Among the study participants, 66.1% said they intended to get the COVID-19 vaccination when it became available. This finding further corroborates Zawahrah and coworker's findings on the Palestinian populations high expressed willingness for vaccination. Although intention plays a significant role in motivating people to adopt healthy habits[21, 22], vaccination intention is probably higher than vaccine uptake[20]. Therefore, it is crucial to preemptively understand the elements related to vaccination intention to help policy and communication when a vaccine becomes available. According to our research, personal and clinical characteristics, beliefs about general vaccination, and attitudes and beliefs about COVID-19 and the COVID-19 vaccine explained 76% of the variation in vaccination intention.

Importantly, we found that hesitancy to be vaccinated was associated with negative general COVID-19 vaccination beliefs and attitudes, insecurity due to the rapid development of the vaccine, concerns about COVID-19 vaccination, fear of needles, distrust in vaccine against mutation, fear that the vaccination would cause adverse effects or lead to infertility, distrust in healthcare policy, and lack of sufficient information about the COVID-19. These findings further highlight the populations' mistrust in the systems that forcefully govern them and shows a significantly higher hesitancy rate among students in health majors compared to the US, Sudan, and Iraq, where hesitancy rates were 44.2%, 47%, and 65.22%, respectively[23-25]. In a similar vein to our Palestinian sample, the latter Iraqi demographic with the highest hesitancy rate following our Palestinian sample identified mistrust in the public health sector as a primary barrier to vaccination. This shared high hesitancy rate between the two samples with this major barrier as a common factor between them further emphasizes the important detrimental role that foreign invasions and colonial dominance cause between the populations and public health services. Indeed, it appears that this factor alone warrants further investigation as it is evident that with both our Palestinian sample and Mahdi's Iraqi sample, mistrust in public health services seems to be playing a big role with both samples showing unusually high vaccination hesitancy in comparison to countries that are not under direct foreign invasion such as the US, itself a colonizing force to the Iraqi population.

In this study, we found that the main determinants for willingness to be vaccinated were fear of being infected with Covid-19, desire to get back to normal life, fear of transmitting the infection to family and others. These results are consistent with research conducted in Poland, Sudan, Uganda, and Egypt[24, 26-28]. Interestingly, the fear of transmitting the infection to others in the community, which was found to be a particularly important factor among the Sudanese student sample in Osman and colleagues' research, appears to be a shared variable within especially collectivist cultures, where concern for others plays a significant role in personal decision making. These results are indicative of a prosocial motivation to immunize in service of the community, this subsequently appears to be an important entry point for motivating others to vaccinate. Meaning that immunization in service of the collective wellbeing of the community appears to be a valid motivator in

facilitating vaccine uptake within the Palestinian population.

Acceptance of the COVID-19 vaccination, particularly among young people, is significantly influenced by the dissemination of accurate information regarding the vaccine. The results demonstrated that most study participants believed health care practitioners' knowledge regarding the COVID-19 vaccination more than they did from other sources. Additionally, they stated that they trusted the COVID-19 vaccination information they heard on TV and radio. In the same vein, our findings demonstrate that participants relied heavily on social media to learn about the COVID-19 vaccination. This may be suggestive of this populations outsourcing of mistrusted news outlets that represent the colonial system and its extensions and suggests that COVID-19 vaccine knowledge dissemination should be made accessible by independent and locally trusted health organizations who are able to utilize social media outlets for this educational purpose.

Moreover, these results were in line with Pakistani research that found most young people got their knowledge about the COVID-19 vaccination from print or social media[29]. young people stated that the information they learned from social media would cause them to think twice before refusing the COVID-19 vaccination. Consequently, the spread of false information about the COVID-19 vaccine via social media could lead to a rise in vaccination reluctance. Similarly, previous research claim that the majority of young people obtain false information from social media sites like Tik Tok, which may contribute to young people's reluctance to get the COVID-19 vaccination[30]. It is thus essential that independent health organizations take up the role of distributing information that debunks the misinformation shared on social media and attempt to engender a trusting and critical conversation with the Palestinian public on the barriers to and importance of receiving the COVID-19 vaccine.

Our study results highlight the significance of providing the public with correct information on the COVID-19 vaccine through a variety of ways including government and ministry of health websites, social media, and local media. In order to develop an effective vaccination strategy to achieve herd immunity there is a necessity to determine the reasons for their hesitancy to get the COVID-19 vaccine. However, there is a dearth of knowledge regarding the motivation, willingness and challenges of college students regarding the COVID-19 vaccination and the COVID-19 vaccine. Therefore, the purpose of this study was to determine the motivation, willingness and challenges among Al-Quds University students majoring in health with regard to the COVID-19 vaccine.

6. Conclusion

According to our findings, people's overall perceptions about vaccinations “whether favorable or unfavorable” are what motivate individuals to be vaccinated at this time. Although the media has primarily presented a good image of the COVID-19 immunization, if additional facts “including false information” about the vaccine comes to the surface, there is a chance that this favorable perception may be damaged, which might have a detrimental impact on people's intentions to get the vaccine and their uptake of it. There remains a significant level of COVID-19 vaccination reluctance among students in health majors, at Al-Quds University in Palestine, mainly among females. The study results revealed that students' perceptions of distrust in vaccine safety, concerns about side effects and their level of trust in the healthcare system were important indicators of their low intention to get the COVID-19 vaccination in Palestine. This reluctance is further amplified by the Palestinian community’s preexisting mistrust and ambivalence towards the existing healthcare system that operates under the supervision and watch of the Zionist colonial system, which has instilled deep fear and suspicion within the oppressed Palestinian population. Subsequently, any evidence of misinformation or conspiracy theories, regardless of accuracy, appears to become quickly internalized by the population as incentive against vaccination. Our findings generate and add a useful knowledge to the existing knowledge on the willingness for and the refusal of obtaining COVID-19 vaccines, which could be used to inform global strategies for encouraging vaccination uptake.

Limitation:

This study is a cross-sectional, causation cannot be determined. Second, because of the unstable situation in Palestine, the surveys had to be self-administered. As a result, self-reporting bias affects the information gathered. The fact that students in health majors have different perspectives on the pandemic and different risk profiles means that the findings cannot be generalized to the broader population. Additionally, the COVID-19 vaccine intention and reluctance among participating students could have changed between data collection and publication of the findings.

It is recommended that independent health organizations take up the educative role on COVID-19 vaccination within the Palestinian community with an emphasis on engendering trust by providing accurate information and by naming and addressing the valid mistrust and hesitation the population feels towards the governing system that rules it. In doing so, these organizations should aim to deemphasize the governmental policy on vaccination and to stress the prosocial benefits of immunization by centering the importance of herd immunity and individual social responsibility; an approach that speaks to the collective mindset of the Palestinian individual.

Ethical approval and consent to participate: This study was approved by Research Ethical Committee at Al-Quds University.

Acknowledgments: We would like to acknowledge the participants for being a part of this study.

Disclosure: The authors report no conflicts of interest in this work.

7. References

1. World Health Organization. Coronavirus disease (COVID-19): looking back at a year that changed the world: WHO's response to COVID-19. https://www.who.int/emergencies/diseases/ novel-coronavirus-2019/strategies-and-plans [Accessed 5 Dec 2023].
2. Lane S, MacDonald NE, Marti M, Dumolard L. Vaccine hesitancy around the globe: Analysis of three years of WHO/UNICEFJoint Reporting Form data-2015–2017. Vaccine 2018, 36, 3861–3867.
3. Dubé E. "Addressing vaccine hesitancy: the crucial role of healthcare providers," Clinical Microbiology and Infection, vol. 23, no. 5, pp. 279–280, 2017, Doi: 10.1016/j.cmi.2016.11.007.
4. World Health Organization, "Ten Threats to Global Health in 2019," World Health Organization, Geneva, 2019. [Online]. Available at: https://www.who.int/news-room/spotlight/ten-threats-to-global-health-in-2019. [Accessed 10 Dec 2023].
5. Larson HJ, Jarrett C, Eckersberger E, Smith DM, and Paterson P. "Understanding vaccine hesitancy around vaccines and vaccination from a global perspective: a systematic review of published literature, 2007–2012," Vaccine, vol. 32, no. 19, pp. 2150–2159, 2014, Doi: 10.1016/j.vaccine.2014.01.081.
6. Lane S, MacDonald NE, Marti M, and Dumolard L. "Vaccine hesitancy around the globe: Analysis of three years of WHO/UNICEF Joint Reporting Form data-2015–2017," Vaccine, vol. 36, no. 26, pp. 3861–3867, 2018, Doi: 10.1016/j.vaccine.2018.03.063.
7. Cornwall W. "Officials gird for a war on vaccine misinformation," Science, vol. 369, no. 6499, pp. 14–15, 2020, Doi: 10.1126/science.369.6499.14.
8. Masoud M, Bassyouni RH, Abdel Wahed WY, Al Hawamdeh MIF, Nassar M, Arishi N, Ziad A, Elsidig LA, & Hamed NS. Acceptance of COVID-19 vaccination and associated factors in Middle East countries: a multinational study, Alexandria Journal of Medicine, 60:1, 1-10, 2024, Doi: 10.1080/20905068.2023.2292915.
9. Dror AA, Eisenbach N, Taiber S, Morozov NG, Mizrachi M, Zigron A, Srouji S, Sela E. Vaccine hesitancy: The next challenge in the fight against COVID-19. Eur. J. Epidemiol. 2020, 35, 775–779.
10. Price D, Bonsaksen T, Ruffolo M, Leung J, Thygesen H, Schoultz M, Geirdal AO. Willingness to Take the COVID-19 Vaccine as Reported Nine Months after the Pandemic Outbreak: A Cross-National Study. Soc. Sci. 2021, 10, 442.
11. Amjad Z, Maryam I, Munir M, Salman M, Baraka MA, Mustafa ZU, Khan YH, Mallhi TH, Hasan SS, Meyer JC, et al. COVID-19 Vaccines Status, Acceptance and Hesitancy among Maintenance Hemodialysis Patients: A Cross-Sectional Study and the Implications for Pakistan and Beyond. Vaccines 2023, 11, 904.
12. Troiano G, Nardi A. Vaccine hesitancy in the era of COVID-19. Public Health 2021, 194, 245–251.
13. Gori D, Capodici A, La Fauci G, Montalti M, Salussolia A, Soldà G, Di Valerio Z, Scognamiglio F, Fantini MP, Leask J, et al. COVID-19 Vaccine Refusal and Delay among Adults in Italy: Evidence from the OBVIOUS Project, a National Survey in Italy. Vaccines 2023, 11, 839.
14. Gołębiowska J, Zimny-Zaja CA, Dróżdż M,Makuch S, Dudek K,Mazur G, Agrawal S. Evaluation of the Approach towards Vaccination against COVID-19 among the Polish Population—In Relation to Sociodemographic Factors and Physical and Mental Health. Vaccines 2023, 11, 700.
15. Ajzen I. The theory of planned behavior. Organ Behav Hum Decis Process. 1991;50(2):179–211. Doi: 10.1016/0749-5978(91)90020-T.
16. Abu-Farha R, Mukattash T, Itani R, Karout S, Khojah HM, Al-Mahmood AA, & Alzoubi KH. Willingness of Middle Eastern public to receive COVID-19 vaccines. 2021; Saudi pharmaceutical journal, 29(7), 734-739.
17. Zawahrah HJ, Saca-Hazboun H, Melhem SS, Adwan R, Sabateen A, & Abu-Rmeileh NM. Acceptance of COVID-19 vaccines in Palestine: a cross-sectional online study 2021; BMJ open, 11(10), e053681.
18. Abu-Odah H, Su J, & Musa SS. Unwillingness or reluctance of Palestinians to get the COVID-19 vaccine: the reasons behind it and how to persuade them. 2022; International Journal of Infectious Diseases, 119, 53-55.
19. Hweij RA. An Exploration of Internalized Oppression among Palestinians in Jerusalem (Doctoral dissertation, Wright Institute). 2020.
20. Rogers RW, Prentice-Dunn S. Protection motivation theory. In: Gochman DS, editor. Handbook of health behavior research 1: personal and social determinants. New York, NY: Plenum Press; 1997. p. 113–32.
21. Sniehotta FF, Scholz U, Schwarzer R. Bridging the intention-behaviour gap: planning, self-efficacy, and action control in the adoption and maintenance of physical exercise. Psychol Health. 2005;20(2):143–60. Doi:10.1080/08870440512331317670.
22. Lucia VC, Kelekar A, Afonso NM. COVID-19 vaccine hesitancy among medical students. J Public Health. 2021;43(3):445–449. Doi: 10.1093/ pubmed/fdaa230.
23. Raja SM, Osman ME, Musa AO, Hussien AA, Yusuf K. COVID-19 vaccine acceptance, hesitancy, and associated factors among medical students in Sudan. PLoS One. 2022;17(4): e0266670. Doi:10.1371/journal.pone.0266670.
24. Mahdi BM. COVID-19 vaccine hesitancy and acceptance among medical students: an online cross-sectional study in Iraq. Open Access Macedonian J Med Sci. 2021;9(A):955–958. Doi: 10.3889/oamjms.2021.7399.
25. Paul E, Steptoe A, Fancourt D. Attitudes towards vaccines and intention to vaccinate against COVID-19: implications for public health communications. Lancet Reg Health-Eur. 2021; 1:100012.
26. Kanyike A, Olum R, Kajjimu J. Acceptance of the coronavirus disease-2019 vaccine among medical students in Uganda. Trop Med Health.2021;49:37. Doi: 10.1186/s41182-021-00331-1.
27. Saied SM, Saied EM, Kabbash IA, Abdo SAEF. Vaccine hesitancy: beliefs and barriers associated with COVID-19 vaccination among Egyptian

medical students. J Med Virol. 2021;93(7):4280–4291. Doi: 10.1002/jmv.26910
28. Szmyd B, Bartoszek A, Karuga FF, Staniecka K, Błaszczyk M, Radek M. Medical students and SARS-CoV-2 vaccination: attitude and behaviors. Vaccines. 2021;9(2):128. Doi:10.3390/vaccines9020128.
29. Chaudhary FA, Ahmad B, Khalid MD, Fazal A, Javaid MM, Butt DQ. Factors influencing COVID-19 vaccine hesitancy and acceptance among the Pakistani population. Hum Vaccines Immunother. 2021;17(10):3365–70.
30. Dhama K, Sharun K,Tiwari R, Dhawan M, Emran TB, Rabaan AA, Alhumaid S. COVID-19 vaccine hesitancy—Reasons and solutions to achieve a successful global vaccination campaign to tackle the ongoing pandemic. Hum. Vaccines Immunother. 2021, 17, 3495–3499.

