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Intentions to receive COVID-19 vaccination among people in Gaza Strip

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ABSTRACT

Aims: This project assessed intentions to receive COVID-19 vaccine and its potential influencing factors among adults living in the Gaza Strip.

Method: Data were collected from February through July 2021 when the vaccine distribution just started**.** An online cross-sectional survey was conducted using social media outlets. The respondents include a convenience sample of 325 individuals who are 18 years and older in the Gaza Strip. Bivariate statistics and logistic regressions were used to investigate the factors related to intention to receive vaccine.

Results: Bivariate statistics found that the intention to get the vaccine is significantly higher for males (as compared to females), less educated, and married. Those with chronic disease are more likely to receive COVID-19-vaccine. However, when the other variables were controlled, only gender, profession, and perceived barriers significantly predicted the intentions to receive COVID-19 vaccine.

Conclusion: This project highlighted variables that are associated with intentions to receive COVID-19 vaccine. These finding may be used to develop interventions to foster the acceptance of the vaccine among the people of Gaza Strip.

Keywords: COVID-19 vaccination, COVID-19 hesitancy, COVID-19 uptake, perceived benefits of vaccine, perceived barriers of vaccination

INTRODUCTION

Scientists have been working hard to provide evidence-based treatment for COVID-19 (SARS-CoV-2). Researchers and healthcare leaders view vaccines as the best evidence-based treatment for infectious disease [1]. Vaccines and immunization programs are among the most successful public health interventions for prevention of epidemics and have led to the eradication and control of many life-threatening diseases; however, as the use of vaccines increased, so did concerns around safety and regulations. The World Health Organization (WHO) defined vaccine refusal as delay or not having vaccines even when the vaccine is available. It was rated as one of the top 10 global health threats in 2019 by the WHO [1]. Vaccine refusal is complex and dynamic and can depend on timing, location, and the vaccine. Each year, immunizations prevent almost three million deaths internationally, and an additional one and half million deaths would be avoided if global immunization rates increased [2,3]. The development of different COVID-19 vaccines is a scientific miracle using innovative technologies. New COVID-19 vaccines received FDA and WHO emergency use authorizations and approvals (Moderna's and Pfizer-BioNTech vaccines) [4]. Nonetheless, vaccine refusal is still a major problem in many areas of the world and is contributing to the continuation of the COVID-19 pandemic.

Although more than 10.9 billion COVID-19 vaccine shots have been given in more than 184 countries [5], the global priority right now is to provide worldwide access to these vaccines to end the COVID-19 pandemic. For this strategy to work, people need to accept the vaccine. Experts warn of an increased international decline in people trust in vaccinations and vaccine refusal [6]. Social media (Facebook, Twitter) is full of negative information about the vaccine, such as claims of severe side effects and becoming a G5 antenna. In addition, many countries have plans for vaccinations, but the vaccinations rates are not as high as expected. In the Influenza case, the USA, Canada, and the Scandinavian countries were the only countries to achieve more than 20% coverage [7]. The World Health Organization listed "vaccine refusal" as the "ten threat" to global health in 2019. The question now is when the COVID-19 vaccine is widely available for a given country, will the people take the vaccine?

Although several COVID-19 vaccines received full approval, it is still uncertain when these vaccines were available to the

Palestinian population at the time of collecting information for this project. It is imperative to assess intentions toward COVID-19 vaccine in the Palestinian areas (Gaza Strip and the West Bank) so that tailored interventions can be developed to facilitate the vaccine uptake. Interventions will combat misinformation, increase COVID-19 acceptability, and increase the rates of inoculation against COVID-19. The current project aims to assess intentions to receive COVID-19 vaccine among adults living in Gaza Strip area and to explore sociodemographic and health related variables associated with intentions to receive COVID-19 vaccine. Findings of this project will build the foundation for the development of interventions and strategies to increase COVID-19 vaccination.

METHOD

An exploratory cross-sectional design was used to describe intentions to receive COVID-19 vaccine of adult and its potential influencing factors. An online survey was distributed through social media outlets such as Facebook, LinkedIn, Twitter, and the networks of the project team. The participants have to be 18 years or older and live in the Gaza Strip. The sample size required study was estimated using G-Power 3.1 [8]. A minimum sample size of 300 is required for a small effect size, alpha of 0.05 and power of 0.95.

COVID-19 Vaccination Survey

The survey consisted of 24 questions divided into four sections. Sociodemographic and health related variables such as having family member/s with chronic diseases. Chronic diseases were defined as if the individuals had at least one of following 12 diseases: asthma, COPD, or emphysema, hypertension, diabetes, heart disease, cancer, obesity, liver disease, kidney disease, immune disorder, and emotional or mental health problems such as depression and anxiety.

Intention to receive the vaccine was defined by the question “Once COVID-19 vaccine becomes available to you, will you get vaccinated?” With choices yes, no, or not sure. Perceived barriers and benefits were measured with questions rated on a 4-point Likert scale which required the participants to indicate to what degree they agree with the statement. Responses to items of each subscale are summed to form two total scores; higher scores indicate greater agreement with the statements. Cronbach’s alpha is 0.73 for perceived barriers scale (nine questions), and .85 for perceived benefits (four questions).

The survey was designed based on previously published literature that addressed similar diseases [1,2,3,9]. The survey was tested with a sample of 10 participants, and survey content was evaluated based upon the findings of the pilot test.

Procedure

The Helsinki Committee in Gaza Strip approved the conduction of the study. To comply with containment actions and social distancing recommendation, an anonymous online survey was used to assess sociodemographic and health associated variables, and intentions to receive COVID-19 vaccine using Google Forms. A short invitation along with a link to learn more about or complete the survey was shared with potential participants via social media (e.g., Facebook, Twitter, and WhatsApp). The project team asked people in their network to share the project invitation including links to the anonymous survey (for example Facebook and LinkedIn). Before participants completed the survey, they were provided with information about the purpose of the project and the fact that their participation was voluntary, and that their responses were confidential and anonymous. Before completing the survey, potential participants were asked to indicate if they are at least 18 years of age or older. Those not meeting this eligibility criteria were informed they were not eligible to participate in the survey. To confirm validity and reliability of the project survey, a pilot test was performed with 10 participants to assess feasibility of the survey. It took an average time of 10 minutes to complete the survey.

Data Analysis

SPSS version 28 was used for data analysis. Descriptive statistics were used to describe intentions to receive COVID-19 vaccine. Pearson’s Chi-square tests were used to assess the relationship between categorical independent variables (IVs) and intentions to receive COVID-19 vaccine. ANOVAs were used to examine for differences in means of intentions to receive COVID-19 vaccine by categorical independent variables. Finally, binary logistic regressions were used to test how each IV was related to intentions to receive COVID-19 vaccine, and to identify the best predictors to receive COVID-19 vaccine.

Those variables that showed statistical significance in bivariate analysis were entered in the logistic regression analysis, and a p-value of <.05 was adopted as the cutoff. In addition, variables deemed to have substantial importance were also entered into the regression model (age, gender, income, education, marital status, job, stigma, chronic disease, COVID-19 symptom, elders in house, perceived barriers, and perceived benefit). Although the three categories of dependent variables require multinominal logistic regression, our sample size does not provide sufficient statistical power; thus, those who responded, “not sure” and “no” were combined into one group, to enable the use of binary logistic regression. To increase statistical power, some categories of the independent variables were combined due to small sample sizes in each category or minor difference in intentions to receive COVID-19 vaccine to increase the statistical power.

RESULTS

Demographic and Health Status Data

Most respondents were male (65.20%), 18-24 years old (63.70%), had a bachelor’s degree (58%), and were single (66.80%); 48% were nursing students, and 47.70% were unemployed (**Table 1**).

Intentions to Receive COVID-19 Vaccine

One-third of the participants (30.50%) reported that they planned to get the COVID-19 vaccine if it is available, whereas 39.40% indicated that they would not get the vaccine, the rest were not sure (**Table 2**).

Regarding concerns of participants toward COVID-19 vaccine, 70% of the respondents strongly disagreed that the vaccination side effects would happen to them, and 72% had doubts about the effectiveness of the vaccines. Almost 80% believed that natural immunity is not better than vaccination, and 71% considered COVID-19 a mild disease (**Table 3**).

Table 1. Participants' demographic characteristics (n=325)

Items	Frequency	Percentage (%)
Gender		
Male	212	65.2
Female	113	34.8
Age		
Under 18	19	5.8
18-24 years old	207	63.7
25-34 years old	60	18.5
35-44 years old	31	9.5
45-64 years old	8	2.4
Income		
>2,000 Shekel	43	13.2
1,450-2,000 Shekel	59	18.2
Less than 1,450 Shekel	68	20.9
Unemployed	155	47.7
Marital status		
Divorced	8	2.4
Married	98	30.2
Single	217	66.8
Widowed	2	0.6
Level of education		
Doctoral or professional degree	3	0.9
Master's degree	41	12.6
Bachelor's degree	189	58.2
Some college or associate degree	46	14.2
High school	46	14.1
Job		
Medical technologist	33	10.1
Nurse	99	30.5
Nursing student	156	48.0
Others	29	1.7
Physical therapist	8	2.5
Employment status		
Employed full time	82	25.2
Employed part time	27	8.3
Student	200	61.5
Unable to work	12	3.6
Unemployed due to COVID-19	7	2.2
Total	**325**	**100.0**

Table 2. Intentions to receive COVID-19 vaccine by participant characteristics (n=325)

Variables		Yes [n (%)]	No [n (%)]	Not sure [n (%)]	Statistics	p-value
Gender	Female	55 (25.9)	87 (41.0)	70 (33.0)	6.17	0.04
	Male	44 (38.9)	41 (36.3)	28 (24.8)		
Age	Under 18	7 (36.8)	10 (52.6)	2 (10.5)	15.48	0.05
	18-24 years old	63 (30.4)	69 (33.3)	75 (36.2)		
	25-34 years old	16 (26.7)	28 (46.7)	16 (26.7)		
	35-44 years old	10 (32.3)	17 (54.8)	4 (12.9)		
	45 and above	3 (37.5)	4 (50.0)	1 (12.5)		
Education	High school or less	16 (34.8)	15 (32.6)	15 (32.6)	21.1	<0.01
	Some college/associate/bachelor	75 (31.9)	82 (34.9)	78 (33.2)		
	Graduate degree	8 (18.2)	31 (70.5)	5 (11.4)		
Marital status	Married	30 (30.6)	50 (51.0)	18 (18.4)	14.47	0.01
	Single	65 (30.0)	73 (33.6)	79 (36.4)		
	Divorced/widowed/separated	4 (40.0)	5 (50.0)	1 (10.0)		
Job	Nursing	66 (26)	104 (40.9)	84 (33.1)	12.05	0.02
	Other health professionals	20 (48.8)	14 (34.1)	7 (17.1)		
	Others	13 (30.5)	10 (39.4)	7 (30.2)		
Income	Less than 1,450 Shekel	19 (27.9)	26 (38.2)	23 (33.8)	14.64	0.02
	1,450-2,000 Shekel	20 (33.9)	28 (47.5)	11 (33.8)		
	>2,000 Shekel	14 (32.6)	23 (53.5)	6 (14.0)		
	Unemployed	46 (29.7)	51 (32.9)	58 (37.4)		
	Missing	36 (30.8)	4 (39.3)	35 (29.9)		
COVID-19 expectation	Will not get COVID-19	33 (40.2)	27 (32.9)	22 (26.8)	15.01	0.02
	Mild	40 (30.8)	45 (34.6)	4 (34.6)		
	Seriously ill	9 (26.5)	14 (41.2)	11 (32.4)		
	Already had	7 (13.5)	30 (57.7)	15 (28.8)		

Table 2 (Continued). Intentions to receive COVID-19 vaccine by participant characteristics (n=325)

Variables		Yes [n (%)]	No [n (%)]	Not sure [n (%)]	Statistics	p-value
Chronic disease	Yes	54 (35.8)	65 (43.0)	32 (21.0)	11.07	0.04
	No	45 (25.9)	63 (36.2)	66 (37.9)		
Stigma of having COVID-19	Yes	53 (36.1)	52 (35.4)	42 (28.6)	4.07	0.13
	No	46 (25.8)	76 (42.7)	56 (31.5)		
Perceived benefits of vaccine	M (SD)	13.1 (2.27)	10.67 (2.57)	11.87 (1.97)	28.32 AN*	<.01

Note. *AN: Analysis of variance

Table 3. Concerns toward COVID-19 vaccination among people in Gaza Strip

Item	SD [n (%)]	NA [n (%)]	A [n (%)]	SA [n (%)]
Side effects	24 (7.4)	74 (23)	131(40.3)	95 (29.2)
Quality of vaccine	28 (8.6)	105 (32.3)	144 (44.3)	48 (14.8)
Allergic to other vaccines	36 (11)	110 (33.8)	115 (25.4)	64 (19.7)
Worry about safety	24 (7.4)	53 (16.3)	124 (38.2)	124 (38.2)
Vaccine emergency use authorization	26 (8.0)	70 (21.5)	156 (48.0)	73 (22.5)
Possible illnesses associated with COVID-19 vaccine	30 (9.2)	78 (24.0)	150 (46.2)	67 (20.6)
Wait until vaccine tried by many other people	17 (5.2)	57 (17.5)	121 (37.2)	130 (40.0)
Wait for next season/wave of COVID-19	49 (15.1)	102 (31.4)	114 (35.1)	60 (18.5)
Have doubts about effectiveness of vaccine	21 (6.5)	66 (20.3)	148 (45.5)	90 (27.7)
Pregnant	51 (15.7)	111 (34.2)	97 (29.8)	66 (20.3)
Natural immunity is better	19 (5.8)	40 (12.3)	112 (34.5)	154 (47.4)
COVID-19 is a mild disease	125 (38.5)	107 (32.9)	47 (14.5)	46 (14.2)

Note. SD: Strongly disagree; NA: Not agree; A: Agree; & SA: Strongly agree

Table 4. Perceived benefits of the COVID-19 vaccine

Item	SD [n (%)]	NA [n (%)]	A [n (%)]	SA [n (%)]
Vaccination will decrease the possibility of getting COVID-19 or its complications.	46 (14.2)	107 (32.9)	125 (38.5)	47 (14.5)
Vaccination will protect my family from getting COVID-19 or its complications.	23 (7.1)	60 (18.5)	144 (44.3)	98 (30.2)
Vaccination will protect my job.	28 (8.6)	73 (22.5)	154 (47.4)	70 (21.5)
Vaccination will protect me from any COVID-19 illness hospitalization and treatment costs.	33 (10.2)	84 (25.8)	136 (41.8)	72 (22.2)

Note. SD: Strongly disagree; NA: Not agree; A: Agree; & SA: Strongly agree

Perceived Benefits of COVID-19 Vaccination

Regarding the benefits of COVID-19 vaccine, 46% of the respondents believed that vaccination reduces the chance of getting COVID-19 or its consequences; only 25% of respondents believed vaccination will protect the family from getting COVID-19 or its complications; 36% agreed that vaccination will protect them from COVID-19 hospitalization and treatment costs (**Table 4**).

Associations Between Intentions to Receive COVID-19 Vaccine and Potential Influencing Factors

Bivariate statistical tests were first performed to test if there is an association between intentions to receive the COVID-19 vaccine and associated factors. The results are presented in **Table 5**.

Table 5. Logistic regression for predicting intention to take COVID-19 vaccine (n=325)

Variable	B	SE	Wald	df	p-value	AOR		
							Lower	Upper
Age (18 under)			**1.77**	**3.00**	**0.62**			
18-24 years old	-0.74	0.73	1.03	1.00	0.31	0.48	0.12	1.99
25-34 years old	-1.06	0.82	1.66	1.00	0.20	0.35	0.07	1.74
>35 years old	-0.65	1.00	0.43	1.00	0.51	0.52	0.07	3.71
Gender (female)	**0.93**	**0.38**	**6.08**	**1.00**	**0.01**	**2.54**	**1.21**	**5.34**
Income (<1,450 Shekel)			**0.04**	**2.00**	**0.98**			
1,450-2,000 Shekel	0.08	0.46	0.03	1.00	0.87	1.08	0.44	2.67
>2,000 Shekel	0.08	0.59	0.02	1.00	0.90	1.08	0.34	3.43
Education (≤high school)			**0.14**	**2.00**	**0.93**			
Some college	0.11	0.45	0.06	1.00	0.81	1.11	0.47	2.67
Graduate degree	-0.10	0.78	0.02	1.00	0.90	0.90	0.20	4.19
Marital status (single)	0.43	0.47	0.83	1.00	0.36	1.54	0.61	3.86
Job (Nursing)			**12.89**	**2.00**	**0.00**			
Other health professionals	1.45	0.48	9.03	1.00	0.00	4.26	1.66	10.98
Others	1.42	0.58	6.13	1.00	0.01	4.15	1.35	12.80
Stigma (No)	**-0.24**	**0.33**	**0.53**	**1.00**	**0.47**	**0.79**	**0.41**	**1.50**
Chronic disease (No)	**0.48**	**0.35**	**1.82**	**1.00**	**0.18**	**1.61**	**0.81**	**3.23**
COVID-19 symptom (will not get COVID-19)			**6.25**	**3.00**	**0.10**			
Mild	-0.33	0.39	0.74	1.00	0.39	0.72	0.34	1.53
Seriously ill	-0.54	0.55	0.97	1.00	0.33	0.58	0.20	1.71
Already had	-1.46	0.59	6.10	1.00	0.01	0.23	0.07	0.74

Note. Those in parentheses are reference group

Table 5 (continued). Logistic regression for predicting intention to take COVID-19 vaccine (n=325)

Variable	B	SE	Wald	df	p-value	AOR		
							Lower	Upper
Elders in house (No)	**0.52**	**0.34**	**2.33**	**1.00**	**0.13**	**1.68**	**0.86**	**3.25**
Perceived barriers	**-0.04**	**0.03**	**1.44**	**1.00**	**0.23**	**0.96**	**0.91**	**1.02**
Perceived benefits	**0.42**	**0.09**	**24.21**	**1.00**	**<.01**	**1.52**	**1.29**	**1.79**
Constant	**-4.93**	**1.63**	**9.17**	**1.00**	**0.00**	**0.01**		

Note. Those in parentheses are reference group

There were significant associations between intentions of receiving the COVID-19 vaccine and demographic variables including age, gender, job, marital status, education, and income. Specifically, males are more likely to intend to receive the vaccine than females (38.90 % vs. 25.90%), X^2=6.17, p=.046, less educated people are more likely to intend to take the vaccine than more educated, those are single are more hesitant than those who are married and divorced/separated/widowed (36.40% vs. 18.40% and 10 %, p=.01). Neither the stigma of having COVID-19 nor the perceived risk related to family members or friends (i.e., having a person in the home who is 65 years or older at home, tested positive, has a chronic disease) are significantly associated with intentions to receive the COVID-19 vaccine. Those with at least one chronic disease were more likely to intend to take the COVID-19 vaccine (35.80% vs 25.90%), X^2=11.70, p=.004. Having insurance is not related to intentions to receive the COVID-19 vaccine. While there is no significant association between perceived barriers and intentions to receive COVID-19 vaccine, as significant association were found between the intentions and perceived benefits of COVID-19 vaccine, $F_{(2, 295)}$=28.32, p<.01. Those who were willing to get vaccinated perceived more benefits of the COVID-19 vaccine than those who were unwilling or not sure.

A binary logistic regression was further used to find factors that predict willingness to get vaccinated. The predictors were selected based on bivariate statistical results reported above. The Hosmer-Lemeshow goodness-of-fit test resulted in X^2=7.64, df=8, p=.47, indicating a good fit, and explained 36% of variance in the log odds of intentions to receiving COVID-19 vaccine (Nagelkerke R-ssquare=.36).

Gender, job, and perceived barriers were the only three variables that were significantly associated with COVID-19 vaccine intentions when other variables were controlled. The odds of males taking the vaccine is 1.5 times higher than that of female (AOR=2.54, 95% CI [1.21, 5.34]). The odds that other health professionals and professionals other than health care will take the COVID-19 vaccine is four-fold that for nurses and nursing students (AOR=4.20 and 4.10, respectively). Perceived benefits significantly correlate intentions to receive COVID-19 vaccine; with a one-point increase in perceived benefit, the odds of having intentions to receive the COVID-19 vaccine will increase by 0.51, p<.001. Those who have had a positive diagnosis were less likely to take the COVID-19 vaccine compared with those who have not had a positive diagnosis (AOR=0.23, 95% CI [.07, 0.74]). Age, marital status, income, and education were no longer significant when other variables were controlled in the model. In addition, belief in whether they will get COVID-19 within the next six months did not predict the intentions to receive the vaccine.

DISCUSSION

This project examined the intentions of individuals living in the Gaza Strip to receive the COVID-19 vaccination and the potential influencing factors. Because the data was collected from February through July 2021 when there was a high occurrence of COVID-19, increased mortality rates worldwide, and the beginning of vaccine distribution, the findings will provide us with insights into what influenced people's intentions to take the vaccine when the risk of disease is high.

Approximately one third (30%) of the participants in this study were willing to receive the vaccine, which is similar to this finding is similar to what's found in a study in the US [1] in which 33%, but much lower than European countries. The enormous difference could be due to trust government decisions.

The willingness to take vaccination in China is slightly higher with approximately 38.70% of the respondents were certain to receive the vaccine [10]. Malaysia (52%) [11], Indonesia (52%) [12], and Japan (67%) [13] are much higher in COVID-19-vaccine uptake. The proportion of people who are willing to take vaccine was the highest in a France study (74%) [14], followed by 73% in Europe (whole Europe) in a study [15]. Another US study [1] conducted between revealed a 33% higher proportion of respondents accepted vaccination for COVID-19.

The findings are similar to some countries. A study performed in the US showed that only 33% of respondents were hopeful about the COVID-19 vaccination [1]. Likewise, in a 2020 cross-sectional survey in which 991 Americans were interviewed, 50% of the respondents planned to receive the vaccine [1]. The study in China revealed that approximately 38.70% of the respondents were certain to receive the vaccine [10]. Also, a study performed in Malaysia showed a greater proportion of respondents intended to receive the vaccine against COVID-19 (52%) [11]. Furthermore, a study performed in Indonesia found that 67% of the participants intended to receive the vaccines [12]. A similar study in Japan revealed 67.10% of the participants intended to receive the vaccination [13]. Also, COCONEL Group performed an online survey and reported a high vaccine intention in France, as 74% of the respondents stated they would receive the vaccine [14]. The high intention was also revealed in studies performed in the US (71.10%) [1] and in Europe (73%) [15].

A global survey that included 19 nations showed that over half of the participants (71.50%) from these nations stated that they would receive the vaccine if it was available [16]. The percentage of individuals considering vaccination is higher than what was seen in the present project. It was argued that vaccine acceptance may need improvement due to the need for wider vaccination coverage to fight the pandemic [17]. Vaccine refusal among the public and healthcare practitioners is a huge concern. Since the reluctance differs in time and type

of vaccine and is affected by different causes [18-20], there is a need to plan for promotional activities to enhance vaccine acceptance factors.

Our study found significant associations between intentions to receive COVID-19 vaccine and demographic variables including gender, age, education, marital status, job, and income. Specifically, male participants were more likely to indicate they would take the vaccine than female participants; less educated people were more likely to take the vaccine than those who were more educated; and those who were single had greater refusal than married and divorced/separated/widowed participants. Having insurance was unrelated to intentions to take the COVID-19 vaccine. There were different reported findings about intentions to receiving COVID-19 vaccinations in other countries. African Americans have medical distrust caused by racial discrimination and had a low probability of receiving the COVID-19 vaccine [21,22]. According to various reports, approximately 40% of the general population had negative views about COVID-19 vaccine [19,23,24]. Lin et al. argued that one of the underlying factors that can explain this attitude is the perception that vaccines are unsafe [10]. The European study showed an acceptance rate of 48.60%. In this project, the recognition of the COVID-19 vaccine was positively correlated with the perceptions that there were no guarantees of safety for vaccines developed during an emergency [19].

Regarding the benefits of COVID-19 vaccine in our project, 46% of the respondents agreed that vaccination reduces the possibility of getting COVID-19 or its consequences; 25% agreed that vaccination will protect the family from getting COVID-19 or its consequences; a 32% agreed that vaccination will protect their job and 36% agreed that vaccination will protect them from COVID-19 hospitalization and treatment costs. Similarly, a study in China found that people had strong beliefs about the effectiveness of the vaccination against COVID-19, as 89.5% thought that vaccination was an effective way to prevent and control COVID-19 regardless of the stage of development of COVID-19 vaccine [11].

Identifying factors linked to intentions to receive vaccine against COVID-19 enabled healthcare professionals to develop and implement strategies and approaches to vaccine education, with a significant focus on ethnic minorities who are affected disproportionally by COVID-19 mortality and morbidity.

Many participants had some concerns about the vaccination. Almost 70% of the respondents reported that the side effect is unlikely to happen to them; 28% had doubts about effectiveness of the vaccine. The findings were different from previous studies. Some participants in previous studies cited uncertainty and mistrust as the primary reasons for avoiding vaccine against COVID-19 [25,26]. No doubt that more clarity about the safety of the vaccines can effectively enhance the acceptance of COVID-19 vaccination.

The second most ranked reason for avoiding vaccination is the participant's concern about vaccine side effects, which is highly influenced by clinical studies that focused on the vaccine's short- and long-lasting side effects. Our team found that almost one-third of the respondents reported that the side effects were likely to happen to them. Countries with more trust in transparent reporting of side effect are more likely to receive the vaccination. For example, the Turkish indigenous population have confidence in their state and are more likely to get vaccinated [27]. It was reported lack of physician recommendations to receive the vaccine as one of the top reasons of not getting vaccinated [28].

A study revealed that the third most common cause for vaccine refusal is vaccine preparation [20]. In our project, 25% of participant were worried about safety and 35% worried about possible illnesses associated with COVID-19 vaccine. Several researchers pointed out public concerns about the vaccine's safety profile as crucial factors in the decision of receiving the vaccine, especially when considering a new vaccine. For example, approximately 13% of 1,155 participants included in a telephone-based interview stated that they intend to postpone vaccination until they receive more validated information about vaccine side effects from other people [29-31]; however, 17% of the participants indicated that they had no intention to receive the vaccine. In a study that used a significantly large sample, 59% of the participants stated that they would delay vaccination because of concerns about the vaccine's safety profile and side effects. A factor that was consistent with accepting vaccine was the effectiveness and safety of the COVID-19 vaccine, an element that is also documented in other related studies [17,19]. The results imply the need to develop reliable advertisement that encompasses contextual social, cultural, and educational factors [17,19,32].

Unwillingness to have vaccine is a huge obstacle to population vaccination even in established vaccination systems. According to [16], other contributing factors to the reluctance include specific vaccine factors and misinformation that makes vaccination less desirable for specific groups. Therefore, before and during the rollout of the vaccine, governments and healthcare practitioners must implement practical strategies to reduce vaccination barriers among immigrant populations alongside supervision and effective communication. It was argued that cultural considerations, healthcare access challenges, and different understanding and attitudes towards the causes of the disease are some barriers experienced by immigrant populations [33]. Thus, it is important to occasionally monitor intentions and practices of specific groups towards COVID-19 vaccine in the following periods. It was argued that the people in developing countries should be prioritized for vaccine availability due to the high need and demand in such populations [13,16].

The team in the current study found gender, job, and perceived barriers are the only three variables that significantly correlated with intentions to receive vaccine against COVID-19 when other variables are controlled. The odds of males taking the Vaccine against COVID-19 were 1.5 times higher than that for females. The odds of other health professionals and professional other than health care will take COVID-19 vaccine were four-fold of that for nurses and nursing students. Perceived benefits still significantly correlated with intention to receive COVID-19 vaccine; with a one-point increase in perceived benefit, the odds of having intention to receive COVID-19 vaccine will increase. In line with other studies performed on COVID-19 vaccine perceptions in the UK [34], this study older participants who had more positive intentions to receive the COVID-19 vaccine. This finding is also consistent with evidence linking increased intentions to receive seasonal influenza vaccination with older age groups. Inconsistent results were shown in previous studies from European countries concerning the effects of sociodemographic characteristics and intentions to get COVID-19 vaccination [35-37].

Implications

Recognizing why people avoid receiving the COVID-19 vaccine, health literary and vaccination literacy assessment among populations is essential to develop educational, effective vaccine campaigns, and to assure the public in the safety of the vaccines. Understanding epidemiological aspects of disease control and vaccination program progress require governments and health practitioners understanding of the intentions, opinions, and practices of the local population towards the COVID-19 vaccines. The findings highlighted the intentions toward receiving COVID-19 vaccines and other correlated factors that affected the acceptance of the vaccine among the people of Gaza Strip.

Limitations

The project used a convenience sampling method. As a result, the findings of this project cannot be widely generalized. Despite this limitation, statistical trends and results show that the sample size was sufficient. Another limitation, using self-reported data reflected the participants feelings during the assessment period and not the real feelings and emotions of participants.

Suggestions for Future Studies

Future studies need to focus on other types of designs such as longitudinal and experimental designs. These types of designs can predict factors that affect intention toward vaccine among public. Using observational instruments instead of self-report will help in providing more objective data about intentions to receive vaccine. Using qualitative research design will provide a clearer picture of the feelings and emotions associated with intentions toward receiving the vaccine among the public.

CONCLUSIONS

This project highlighted the intentions to receiving COVID-19 vaccine and correlated with other variables among adults in Gaza Strip. Identifying factors linked to intentions of receiving the COVID-19 vaccine enables healthcare professionals to develop and implement strategies and approaches to vaccine education, with a significant focus on ethnic minorities who are affected disproportionally by COVID-19 mortality and morbidity.

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