



Hesitation of the Tunisian population to COVID-19 vaccination, and its associated factors

Hésitation de la population tunisienne à la vaccination contre la COVID-19, et ses facteurs associés

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ABSTRACT

Background: Many people are reluctant to be vaccinated against COVID-19.

Aim: To determine the intention to accept COVID-19 vaccine and its associated factors among Tunisians.

Methods: We conducted a cross-sectional study among Tunisians from December 2020 to January 2021 using an online questionnaire. Factors associated with intention to accept coronavirus vaccine were analysed using multinomial logistic regression.

Results: In total, 169 Tunisians participated in our study. The majority were female (85.2%). The mean age was 48.3 ± 11.8 years. Only 33.1% intended to accept to be vaccinated when COVID-19 vaccine will be available in Tunisia and 22.5% were still hesitant. In multinomial logistic regression, participants having high or very high perceived personal risk of COVID-19 infection (aOR: 3.257, 95% CI : 1.204 – 8.815) were more prone to hesitate to accept COVID-19 vaccine rather than those being willing to accept it. Respondents undergoing seasonal influenza vaccination (aOR: 0.091, 95% CI : 0.019 – 0.433) were less prone to refuse COVID-19 vaccine rather than those being willing to accept it. Young ones aged less than 40 years (aOR: 4.324, 95% CI: 1.180 – 15.843) were more prone to refuse COVID-19 vaccine rather than those being willing to accept it.

Conclusion: The acceptance rate of coronavirus vaccination was moderate. Therefore, a good communication and health education at a community level are needed.

Keywords: COVID-19, Coronavirus, Vaccination, Tunisia, Vaccination hesitancy, Vaccination refusal, COVID-19 vaccines.

RÉSUMÉ

Introduction: Plusieurs personnes sont réticentes à la vaccination contre la COVID-19.

Objectif : Déterminer l'intention d'accepter le vaccin contre la COVID-19 et ses facteurs associés chez les Tunisiens.

Méthodes: On a mené une étude transversale parmi les Tunisiens de décembre 2020 à janvier 2021 en utilisant un questionnaire en ligne. Les facteurs associés à l'intention d'accepter le vaccin contre la COVID-19 ont été analysés par la régression logistique multinomiale.

Résultats: Au total, 169 Tunisiens ont été inclus. La majorité était de sexe féminin (85,2%) avec un âge moyen de $48,3 \pm 11,8$ ans. Seulement 33,1% avaient l'intention d'accepter d'être vaccinés et 22,5% étaient encore hésitants. Selon la régression logistique multinomiale, ceux percevant un risque personnel élevé ou très élevé d'infection par la COVID-19 (ORa : 3.257, 95% CI : 1.204 - 8.815) étaient plus hésitants à accepter le vaccin contre la COVID-19 que ceux l'acceptant. Ceux vaccinés contre la grippe saisonnière (ORa : 0,091, IC 95% : 0,019 - 0,433) étaient moins susceptibles de refuser le vaccin contre la COVID-19 que ceux l'acceptant. Les jeunes de moins de 40 ans (ORa : 4,324, IC 95% : 1,180 - 15,843) étaient plus susceptibles de refuser ce vaccin que ceux l'acceptant.

Conclusion : Le taux d'acceptation de la vaccination contre la COVID-19 était modéré. Une bonne communication et une éducation sanitaire à l'échelon communautaire seraient nécessaires.

Mots clés: COVID-19, coronavirus, vaccination, Tunisie, hésitation à propos de la vaccination, Refus de la vaccination, vaccins contre la COVID-19.

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INTRODUCTION

COVID-19 vaccine is considered as the most widely awaited intervention to deal with COVID-19. Many institutions have moved at unseen speed to create it (1). COVAX, the Gavi-led funding scheme to deliver COVID-19 vaccines to low- and middle-income countries, plans to provide 2 billion doses of vaccine by the end of 2021. COVAX aims to guarantee sufficient doses of any vaccine to deliver protection to an initial 20% of the people in the signatory countries. This coverage level can help achieve the immediate goal of protecting people at high risk of COVID-19 (2). However, the availability of the vaccine itself does not necessarily ensure that the population is sufficiently well vaccinated (3). Vaccine acceptance and request are complex in nature and specific to the context, changing according to place, time and the behavioral nature of the population (4).

Our study aimed to describe the intention to accept coronavirus vaccine and to analyze its associated factors among Tunisian people during COVID-19 pandemic.

METHODS

Study design

A cross-sectional study was conducted among Tunisian people from December 2020 to January 2021.

Study population

We included Tunisians who accepted to participate to the survey. Health care professionals were not included.

Data collection

To collect data, we used an online French language self-administered questionnaire developed with Google Forms and submitted through social media. Variables concerned socio-demographic characteristics, COVID-19 infection, seasonal influenza vaccination and their perceptions about coronavirus vaccine.

Data analysis

Data analysis was performed using SPSS version 21.0. We calculated mean \pm standard deviation for the quantitative variables, and frequencies and percentages for the qualitative variables. The association between 2 qualitative variables was studied using Chi-square test. The dependent variable (intention to accept coronavirus vaccine) is composed of 3 categories (no, yes, undecided). So, we used a multinomial logistic regression which compares simultaneously "the intention to refuse coronavirus vaccine" and "undecided response" with "the intention to accept coronavirus vaccine". We established a multinomial logistic regression model. We calculated adjusted Odds ratios (aOR) with the 95% confidence intervals (95% CI) using the "the intention to accept coronavirus vaccine" as the reference category. A p-value < 0.05 was considered significant.

Ethical considerations

The participation was completely voluntary. The anonymity and the confidentiality of the responses were ensured.

RESULTS

Sample characteristics

A total of 169 Tunisians participated in this study. Table 1 shows the socio-demographic characteristics of the respondents.

Table 1. Socio-demographic characteristics of the study population

Characteristics	Number (Percentage)
Sex	
Male	25 (14.8)
Female	144 (85.2)
Age group	
< 30 years	11 (6.5)
31-40 years	32 (18.9)
41-50 years	58 (34.3)
51-60 years	38 (22.5)
≥ 61 years	30 (17.8)
Place of residence	
urban	168 (99.4)
rural	1 (0.6)
Level of study	
secondary	20 (11.9)
university	148 (88.1)
Field of work	
Unemployed or retired	36 (21.4)
education	53 (31.5)
public transport	2 (1.2)
administration	35 (20.8)
others	42 (25)
Work during COVID-19 pandemic	
Continued working as usual	103 (60.9)
Temporary work stoppage due to the pandemic	20 (11.8)
Loss of work due to the pandemic	5 (3)
Unemployment even before the pandemic	41 (24.3)
Nationality	
Tunisian	168 (99.4)
Non Tunisian	1 (0.6)
Marital status	
Single	30 (17.8)
Married	116 (68.6)
Fiancee	4 (2.4)
Divorced	12 (7.1)
Widowed	7 (4.1)
Having kids	
Yes	123 (72.8)
No	46 (27.2)
Chronic diseases	
Yes	39 (23.1)
No	130 (76.9)
Type of chronic diseases	
Diabetes	7 (4.1)
Hypertension	13 (7.7)
Obesity	4 (2.4)
Pulmonary disease	7 (4.1)
Cardiac disease	2 (1.2)
Others	9 (5.3)

COVID-19 vaccine acceptance, avoidance or hesitancy

Almost half of the respondents (44.4%) did not intend to be vaccinated when COVID-19 vaccine will be available in Tunisia, 33.1% intended to accept it, and 22.5% have not decided yet.

Perceptions about the COVID 19 vaccine

The idea of making vaccination against COVID-19 obligatory was considered favorable by 30.7% of the participants. The majority of the respondents (63.9%) thought that good immunization coverage against COVID-19 can help the health care system cope with the COVID-19 epidemic.

Associated factors with intention to accept COVID-19 vaccine

Table 2 details the univariate analysis of factors associated with intention to accept coronavirus vaccine. Multinomial logistic regression showed that those having a high or very high perceived personal risk of being infected by the coronavirus (aOR: 3.257, 95% CI : 1.204 – 8.815) were more likely to hesitate to accept coronavirus vaccine rather than those having intention to accept it. Those undergoing seasonal influenza vaccination (aOR: 0.091, 95% CI : 0.019 – 0.433) were less likely to refuse coronavirus vaccine rather than those having intention to accept it. Young respondents aged less than 40 years (aOR: 4.324, 95% CI: 1.180 – 15.843) were more likely to refuse coronavirus vaccine rather than those having intention to accept it (Table 3).

Table 2. Factors associated with intention to accept coronavirus vaccine : n (%) (univariate analysis)

	Intention to accept coronavirus vaccine			p-value
	No	Yes	Undecided	
Sex				
Male	10 (13.3)	8 (14.3)	7 (18.4)	0.76
Female	65 (86.7)	48 (85.7)	31 (81.6)	
Age group				
< 40 years	25 (33.3)	6 (10.7)	12 (31.6)	
40-60 years	41 (54.7)	35 (62.5)	20 (52.6)	0.02
> 60 years	9 (12)	15 (26.8)	6 (15.8)	
Level of study				
Secondary	9 (12)	4 (7.3)	7 (18.4)	NA*
University	66 (88)	51 (92.7)	31 (81.6)	
Chronic diseases				
No	65 (86.7)	37 (66.1)	28 (73.7)	0.019
Yes	10 (13.3)	19 (33.9)	10 (26.3)	
Perceived personal risk of being infected by the coronavirus				
Low or moderate risk	55 (73.3)	47 (83.9)	22 (57.9)	0.02
High or very high risk	20 (26.7)	9 (16.1)	16 (42.1)	
Relatives tested positive for coronavirus				
No	24 (32)	22 (39.3)	17 (44.7)	0.388
Yes	51 (68)	34 (60.7)	21 (55.3)	
Having serious cases of COVID-19 among relatives or colleagues				
No	47 (62.7)	37 (66.1)	25 (65.8)	0.906
Yes	28 (37.3)	19 (33.9)	13 (34.2)	
Seasonal influenza vaccination				
No	73 (97.3)	41 (73.2)	29 (76.3)	<10⁻³
Yes	2 (2.7)	15 (26.8)	9 (23.7)	

*Not applicable

Table 3. Multinomial logistic regression of factors associated with intention to refuse coronavirus vaccine or to be hesitant, with « intention to accept » as the reference category.

« intention to accept » as reference	Undecided		No intention to accept coronavirus vaccine	
	aOR [95% CI]	p-value	aOR [95% CI]	p-value
Perceived personal risk of being infected by the coronavirus				
Low or moderate risk		1		1
High or very high risk	3.257 [1.204 ; 8.815]	0.02	1.309 [0.512 ; 3.342]	0.574
Seasonal influenza vaccination				
No		1		1
Yes	1.206 [0.425 ; 3.428]	0.725	0.091 [0.019 ; 0.433]	0.003
Age group				
<40 years	3.801 [0.896 ; 16.134]	0.07	4.324 [1.180 ; 15.843]	0.027
41 – 60 years	1.235 [0.386 ; 3.953]	0.722	1.293 [0.467 ; 3.584]	0.621
>60 years		1		1

aOR: odds ratio(OR)

95% CI : 95% confidence interval

DISCUSSION

The results of our study have shown that only a third intended to accept COVID-19 vaccine. In multinomial logistic regression, factors associated with intention to accept coronavirus vaccine were perceived personal risk of being infected by the coronavirus, seasonal influenza vaccination and age group.

In our study, the percentage of participants having the intention to accept coronavirus vaccine was moderate (33.1%) and 22.5% have not decided yet. According to a cross-sectional study carried out in Saudi Arabia, 64.72% had the intention to accept the COVID-19 vaccine (5). Another study carried out in the United States reported that 57.6% of respondents accepted to be vaccinated, 31.6% were not certain, and 10.8% refused to be vaccinated (6).

The acceptance rate in our study population was moderate. Our study was carried out during the COVID-19 pandemic, just one to two months before the availability of the coronavirus vaccine in Tunisia. By the end of our study (24 January 2021), the number of COVID-19 confirmed cases in Tunisia reached 195314 (daily increase of 2041 new cases) with 6154 deaths (daily increase of 62 deaths) (7). The tendency to accept COVID-19 vaccine by a third of our study population may be favoured by these alarming numbers.

In our study, multinomial logistic regression showed that those having a high or very high perceived personal risk of being infected by the coronavirus were more likely to hesitate to accept coronavirus vaccine rather than those having intention to accept it. Those undergoing seasonal influenza vaccination were less likely to refuse coronavirus vaccine rather than those having intention to accept it. Young respondents aged less than 40 years were more likely to refuse coronavirus vaccine rather than those having intention to accept it. According to a study carried out in Saudi Arabia, 64.72% accepted the coronavirus vaccine. Being above 45 years was significantly associated with COVID-19 vaccine acceptance. Furthermore, people trustful in the health system (aOR: 3.05;

95% CI: 1.13-4.92) and participants with a higher perceived risk of COVID-19 infection (aOR: 2.13; 95% CI: 1.35-3.85) were most prone to accept the COVID-19 vaccination (5).

In our study, participants having a high or very high perceived personal risk of being infected by the coronavirus were more likely to hesitate to accept coronavirus vaccine rather than those having intention to accept it. According to a cross-sectional UK study carried out among older adults and patients having chronic respiratory disease, those who felt themselves susceptible to contracting COVID-19 reported that COVID-19 vaccination can provide a sense of protection and help them maintain their health by acquiring antibodies and COVID-19 immunity (8). It seems possible that our results are due to the fact that those having a high or very high perceived personal risk of being infected by the coronavirus are aware of the existence of the risk, and are therefore compliant with the preventive measures that may be sufficient to protect them. The perception of risk is an essential component of the decision-making process. So, people at risk of being infected by COVID-19 should be more likely to accept COVID-19 vaccination (9).

In our study, participants undergoing seasonal influenza vaccination were less likely to refuse coronavirus vaccine rather than those having intention to accept it. A study performed in Saudi Arabia on May 2020 showed that subjects having a history of receiving seasonal influenza vaccines were 1.594 times more susceptible to accept COVID-19 vaccination (10). It can be suspected that the acceptance of vaccination is a habit of individuals (11). The relationship between the acceptance of previous influenza and the acceptance of the coronavirus vaccine suggested that the encouragement of influenza vaccination can be helpful to improve the use of coronavirus vaccine or any other vaccine during pandemics. So, it can be as an important component of their healthcare providers' preparedness plan (12).

In our study, young respondents aged less than 40 years (aOR: 4.324, 95% CI: 1.180 – 15.843) were more likely to refuse coronavirus vaccine rather than those having intention to accept it. Contrary, a study performed in Kuwait showed that the two age groups that were more likely to accept coronavirus were between 18 and 29 years (aOR: 1.57, 95% CI: 1.06-2.33, p=0.024), and between 30 and 39 years (aOR: 0.9, 95% CI: 0.63-1.29, p=0.566) (10). A possible explanation of our results may be the fact that young people can believe that they do not need COVID-19 vaccination because they believe they are healthy and not suffering from chronic diseases and therefore are not at high risk of contracting the coronavirus.

The main weakness of this study was the method of data collection (an online questionnaire) resulting in volunteer sampling.

The acceptance rate of COVID-19 vaccination in our study was moderate. Therefore, we should implement prompt and targeted efforts including an information and a good communication about the vaccines and a health education to increase COVID-19 vaccine acceptance in populations. Further studies should be conducted on people receiving COVID-19 vaccination in Tunisia to ensure vaccine efficacy and safety.

CONCLUSION

Almost a quarter of Tunisians hesitated to accept coronavirus vaccine, and almost a half did not intend to be vaccinated. A well studied strategy is needed to convince people of vaccination in order to prevent the spread of the virus.

Declaration of interest

The authors declare no conflicts of interest.

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