



## Behavioral determinants potentially influencing COVID-19 vaccine acceptance among pharmacy professionals in Qatar: a nationwide survey using the Theoretical Domains Framework

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### ABSTRACT

**Background:** There is a paucity of robust, theory-based research investigating vaccination behavior.<sup>1</sup> Using Theoretical Domains Framework (TDF), the study aimed to explore the key behavioral determinants influencing vaccine behavior among pharmacy professionals in Qatar.

**Methods:** A cross-sectional online survey of pharmacy professionals was conducted in April 2021. Survey items included questions related to demographics, vaccination behavior, and behavioral 'determinants' influencing vaccination (Likert statements, TDF items). The draft questionnaire was reviewed for face and content validity with experts and piloted among 80 participants. The sample size was calculated ( $n = 353$ ) using the Raosoft online calculator. Data were analyzed using descriptive and inferential statistics and Principal component analysis (PCA) of TDF items.<sup>2,3</sup>

**Results:** The response rate was 37.40% (1,065/2,400). The majority expressed willingness to receive the COVID-19 vaccines. Participants who refused the influenza vaccine in the past were more likely to refuse the COVID-19 vaccines too ( $\chi^2(1) = 12.6$ , chi-square;  $p < 0.001$ ). The mean (SD) overall percentage score of behavioral determinants influencing vaccine acceptance and advocacy were  $31.2 \pm 19.6$  and  $36.5 \pm 28.2$  (on a scale from -100 to 100). Vaccine acceptance was lower among those who refused any vaccines in the past ( $33.2 \pm 18.9$  vs  $28.7 \pm 20.1$ ;  $p < 0.001$ ) (Table 1). The main barriers to vaccine acceptance were safety, speed of development, and cultural influences. PCA identified 'belief of consequence and emotions (fear and anxiety)' as more negative determinant ( $-1.4 \pm 42.1$ ) potentially influencing vaccine acceptance behavior (Table 2). Although most participants considered it as their professional duty to advocate the use of vaccines, they were unsure if patients will accept their recommendations.

**Conclusion:** Most participants expressed an interest to receive the COVID-19 vaccines and considered it as their professional duty to recommend the use of the vaccine. However, they were unsure if patients would accept their advice. Study findings will assist to develop behavior change interventions targeting individuals.

**Keywords:** COVID-19 vaccine, Vaccine acceptance and advocacy behaviour, Pharmacy professionals, Theoretical Domains Framework, Principal Component Analysis (PCA)

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**Table 1.** Vaccination behavior (acceptance and advocacy).

	Variable (N=927)	Acceptance (-100 to 100 scale)		Advocacy (-100 to 100 scale)	
		Mean SD	p-value	Mean SD	p-value
<b>Gender</b>	Male (n=531)	33.7 ± 18.5	<0.001	40.8 ± 26.3	<0.001
	Female (n=396)	27.8 ± 20.6		30.9 ± 29.5	
<b>Age</b>	<25 years (n=27)	28.1 ± 19.7	>0.05	30.1 ± 26.6	<0.009
	25 - 34 years (n=466)	31.6 ± 19.5		36.1 ± 28.3	
	35 - 44 years (n=319)	29.9 ± 19.7		34.7 ± 26.5	
	45 - 60 years (n=109)	32.6 ± 19.6		43.4 ± 31.2	
	> 60 years (n=6)	44.8 ± 20.4		67.7 ± 32.3	
<b>Country of origin</b>	Eastern Mediterranean Region (n=425)	28.6 ± 20.3	<0.001	32.1 ± 29.8	<0.001
	African region (n=13)	30.2 ± 25.3		24.7 ± 34.4	
	Region of the Americas (n=22)	21.4 ± 15.5		36.7 ± 28.4	
	European Region (n=8)	38.7 ± 31.9		39.1 ± 32.8	
	Southeast Asian region (n=409)	33.8 ± 17.7		42.1 ± 24.6	
Western Pacific Region (n=50)	34.8 ± 22.7	32.9 ± 30.9			
<b>Highest academic qualification</b>	Diploma (n=165)	31.9 ± 20.6	>0.05	39.4 ± 27.7	>0.05
	BSc Pharm/BPharm (n=456)	31.8 ± 19.8		36.3 ± 26.1	
	Masters or equivalent (n=172)	30.5 ± 18.2		36.2 ± 26.1	
	PgDip/PgCert (n=34)	41.2 ± 28.8		41.2 ± 28.7	
	PharmD (n=96)	32.1 ± 26.5		32.1 ± 26.5	
PhD (n=4)	25 ± 37.4	25 ± 37.4			
<b>Registered pharmacist (years)</b>	< 1 year (n=30)	33.6 ± 18.8	>0.05	37.1 ± 30.7	>0.05
	1 – 5 years (n=242)	31.2 ± 19.1		35.6 ± 28.5	
	6 – 10 years (n=177)	31.2 ± 21.6		37.8 ± 28.5	
	11 – 15 years (n=258)	29.9 ± 19.2		33.5 ± 28.4	
	> 15 years (n=220)	30.5 ± 18.3		40.2 ± 31.5	
<b>Practice setting</b>	Hospital Pharmacists (n=493)	28.8 ± 20.2	<0.001	33.9 ± 29.1	<0.014
	Community Pharmacists (n=383)	33.4 ± 18.9		39.1 ± 27.4	
	Pharmacists in polyclinics/clinics (n=51)	40.1 ± 13.3		41.8 ± 22.7	
<b>Current role</b>	Pharmacy technician (n=156)	31.7 ± 19.9	>0.05	39.2 ± 27.1	>0.05
	Staff pharmacists (n=459)	31.1 ± 19.2		35.1 ± 28.3	
	Clinical Pharmacist/specialists (n=94)	27.9 ± 20.7		33.9 ± 25.9	
	Pharmacy supervisors/managers (n=218)	32.3 ± 19.7		38.9 ± 29.4	

**Table 2.** Principal component analysis of vaccine acceptance behavior.

<b>Component 3: Belief of consequence and emotions (Fear and anxiety)</b>	Strongly disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly agree n (%)
**I am worried about the speed of development and testing of COVID-19 vaccine	48 (5.2)	208 (22.4)	275 (29.7)	297 (32)	99 (10.7)
**I am not satisfied with the evidence behind the safety of COVID-19 vaccines	71 (7.7)	283 (30.5)	300 (32.4)	192 (20.7)	80 (8.6)
**I am worried about the side effects of the novel COVID -19 vaccine	64 (6.9)	214 (23.1)	267 (28.8)	272 (29.3)	110 (11.9)
**I am worried that mRNA vaccines can change the genetic makeup of people receiving it?	101 (10.9)	232 (25)	391 (42.2)	139 (15)	64 (6.9)

Cronbach's alpha 0.79

Mean (SD)=-1.4±42.1

\*\* reverse scored

**Ethical approval/IRB statement:** The study received ethical approval from Hamad Medical Corporation's Medical Research Center Qatar (MRC-12-21-131).

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