

Drivers Of The Acceptance Of COVID-19 Vaccines In Jordan: The Moderating Role Of A Pre-Existing Health Condition

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Abstract

This research investigates the drivers influencing the acceptance of COVID-19 vaccination in Jordan. Similarly, it aims to examine the moderating role of pre-existing health conditions. The research's independent variables are Importance and Quality of vaccine, while the dependent variable is represented by Potential Acceptance of COVID-19 vaccination. A quantitative method used a cross-sectional online research questionnaire to collect primary data. A sample of (N=2084) respondents, who follow social media platforms, were selected. Therefore, a stratified simple random method was used in this research. The result shows a positive influence of importance and quality on the acceptance of COVID-19 vaccination. The research confirmed a high rate of acceptance during the pandemic period. The most prominent factors that drove the citizens to take the vaccine were improved control over the spread of disease, in addition to improved health benefits, especially for the individuals with chronic diseases. Other factors that drove citizens to take the vaccine were positive recommendations by family, friends, and/or colleagues. side-effects, country of origin of the vaccine, efficacy, safety, and duration of protection of the vaccine. In conclusion, this research reflected the positive role of the perceived importance and the quality of a vaccine on perceived acceptance of COVID-19 vaccination among the Jordanian people.

Keywords: importance, quality of vaccine, acceptance of COVID-19 vaccination, health condition, Jordan.

Introduction

In March 2020, the coronavirus emerged from China out into the world. That is when the World Health Organization (WHO) declared the coronavirus a Pandemic Disease and became a severe public health issue (Al-Dmour et al., 2020). Governments around the world have rapidly adjusted their health strategies towards the prevention of the further spread of COVID-19 by applying stricter rules and guidelines, such as social

distancing, prohibition of larger social gatherings, testing every suspected case, advising people to stay at home, closures of schools and universities, workplace distancing, and, lastly, lockdowns. These were all introduced in an attempt to reduce the impact of the new coronavirus.

Just like the rest of the world, Jordan has been suffering from the effect of COVID-19 in all aspects of life. Therefore, the Jordanian

government took extraordinary measures and applied strict emergency laws to fight the spread of COVID-19.

At first, there was no known cure for COVID-19, and medics were only able to react to the disease by milderening its symptoms. Then Remdecivir was produced and considered the only possible cure for COVID-19 for a long time, which made vaccination the most viable protection from COVID-19 by preventing and breaking the cycle of infection to achieve herd-immunity through a proper nationwide vaccination campaign. Medical labs and research centers raced to develop safe and effective vaccines from governments to deploy.

Vaccines work by training and preparing bodies' natural defenses – the immune system – to recognize and fight off the viruses and bacteria they target. After being vaccinated, the body is immediately ready to destroy the disease-causing germs should the body be exposed to them again, hence preventing illness (WHO, 2020) or at least reducing the severity of the disease and its effects on human bodies. Vaccines are considered to be critical tools in the battle against COVID-19. Different types of vaccines have been rolled out in many countries, and it is hugely encouraging to see so many vaccines proven successful after having gone into development by many nations around the world. Working as quickly as they can, scientists from around the globe are collaborating and innovating to bring people tests, treatments, and vaccines that will collectively save lives and hopefully end the COVID-19 Pandemic (Abbas et al., 2020; Al Khasawneh et al., 2021).

Research on vaccine production began in early 2020 (Jordan et al., 2020). Almost two years have passed since the beginning of the global pandemic of COVID-19, and today we

have several vaccines to choose from to protect ourselves and prevent the further spread of this virus and its newer variations. Also, governments worldwide have been occupied with vaccinating their populations ever since then.

Since the Jordanian public are hesitant about taking the vaccine, especially when it comes to giving it to their elder family members, Jordanian health officials need to develop effective coronavirus vaccine promotion strategies. Officials need to understand what factors would contribute to vaccine acceptance and what factors would result in vaccine rejection. For this reason, Jordanian health officials need to communicate the benefit of vaccines, safety concerns, side effects, vaccine accessibility, and availability to adjust the beliefs and attitudes of Jordanian citizens more positively towards the acceptance of COVID-19 vaccination.

This research aims to study two factors; perceived vaccine importance, and perceived quality, and their effect on perceived acceptance of COVID-19 vaccination among Jordanian citizens with the moderating role of pre-existing health conditions.

The objectives of the current research are derived from the research aim which, firstly, examines the factors of perceived vaccine importance and perceived quality influencing the perceived acceptance of COVID-19 vaccination. The second objective is to investigate the factors of perceived vaccine importance and perceived quality influencing the perceived acceptance of COVID-19 vaccination, moderated by pre-existing health conditions.

The current research outcomes might be beneficial for health decision-makers to

establish a concrete strategy for vaccination against epidemics and pandemics.

Literature Review

Vaccine hesitancy is not a recent issue. Some parents still refuse to vaccinate their children today by arguing that they are following a more natural approach in life as opposed to injecting their children's bodies with manufactured chemicals. The smallpox vaccine and the Measles, Mumps, Rubella (MMR) vaccine have faced strong rejection being some of the first vaccines developed in history. To achieve the optimal benefits of vaccines, (Kwok et al., 2020) suggests reaching a critical (minimum) herd-immunity threshold of 67% would establish safety in a population.

In the special case of the COVID-19 vaccine, additional factors may also play a role in vaccine hesitancy. Firstly, the speed at which the vaccines were developed and approved within less than one year has raised public concerns over their safety. Secondly, the number of questions regarding the durability of the immune response following a vaccine, and a vaccine's effectiveness to limit the asymptomatic spread, both remained unanswered in the clinical trials (Baldo et al., 2021). Thirdly, the first COVID-19 vaccine's approval was counteracted with an enormous range of scientifically unsupported claims, spread and amplified using online social media, potentially deteriorating the willingness to vaccinate among various groups of individuals (Loomba et al., 2021; Schiavo, 2020). Some studies also indicated vaccine refusal among healthcare workers, which is particularly problematic as it may impact the general public's decision (Gagneux-Brunon et al., 2021; Nzaji et al., 2020). Moreover, differences in efficacy and a profile of solicited adverse effects may cause varying trust in particular COVID-19

vaccines. All these issues may subsequently affect the willingness to vaccinate, particularly when people are not given a choice of which vaccine they wish to receive.

A recent survey in a neighboring Arab country, Qatar, revealed that around 40% of people were not sure of getting a vaccine (Burgos et al., 2021). And, on the contrary, vaccine acceptance rates were reported to be lower in Kuwait (23.6%), the Democratic Republic of Congo (27.7%), and Jordan (28.4%) (Forni et al., 2021; Le et al., 2020). (Lazarus et al., 2021; Subedi et al., 2021) found a 90% acceptance rate in China, compared to 55% in Russia. While (Wang et al., 2020) found that being male and married increased the possibility of taking the vaccine since they are perceived as a higher risk group and are more likely to follow doctor recommendations, yet less likely to follow employer recommendations to take the vaccine. In Nepal, (Subedi et al., 2021) found that 65% of the population found the vaccine to be important safe, and risk-free, while 78% found it to be effective in preventing infection and reducing the severity in case of infection. Yet overall, (Rzymski et al., 2021) found that the perceived importance of vaccination in people's minds mainly was to facilitate easier travel and better work opportunities, in addition to the obvious health benefits.

While (Lazarus et al., 2021) attempted a global survey of acceptance of a COVID-19 vaccine, they tried to measure whether employer recommendation to take the vaccine would affect this likelihood (Cobb et al., 2021). The survey revealed that 71.5% of its participants reported they would take the vaccine freely while 61.4% said they would take it if their employer requested them to

take it, and that populations with higher income levels and education degrees were found to have more positive acceptance rates of the vaccine (Lazarus et al., 2021).

Another survey was conducted but attempted to consider socio-demographic differences when measuring COVID-19 vaccine acceptance in China by (Wang et al., 2020) who conducted an online survey among 2058 Chinese adults where a majority of 91.3% confirmed they would take the vaccine once available, where the questionnaire attempted to measure socio-demographic characteristics including (1) education, (2) employment status and (3) income, in addition to (4) risk perception and the (5) impact of contractive COVID-19 on their lives, work, studies, as well as (6) vaccination history of the seasonal flu-shot who are considered at higher risk group of infection. The study result revealed that 52 % of the targeted population wanted to get the COVID-19 vaccine; however, the rest of the sample which is 48% would like to delay the vaccination until the side effect is safe (Huang et al., 2020).

On the other hand, (Rzymski et al., 2021) found several general factors influencing the reluctance to vaccination, which included (1) past experience with vaccines, (2) level of education and knowledge, (3) risk perception and (4) trust, (5) perceived importance of vaccination, (6) subjective norms, and (7) religious and moral convictions (Dubé et al., 2013). Other barriers for taking the vaccine listed (1) fear of temporary and permanent side effects, as well as (2) blood clotting which is related to pre-existing health conditions in (Zewude & Siraw, 2021) study exploring the COVID19 vaccine acceptance in Ehtiopia by their health sector.

Chronic diseases were found to be less compelling reasons for resisting the COVID19 vaccine in Indonesia by (Nindrea et al., 2021). Their study showed the related factors for COVID-19 vaccination acceptance where high income has the highest odd ratio, followed by encountered with COVID-19, fear about COVID-19, perceived benefits, flu vaccine during the previous season, health-care workers, male, married, perceived risk, trust in health system, chronic diseases, high education, high level of knowledge, and older age.

After the obstacle of vaccine hesitancy is overcome, several studies have attempted to measure vaccine selection among their populations. A recent study in the US done by (Reiter et al., 2020) mentioned the most factors that increased COVID-19 vaccine acceptance were (1) increased efficacy, followed by a longer (2) duration of protection and a significantly lower incidence of major (3) adverse events. Also, US citizens were more likely to select a vaccine that has an endorsement from US centers. However, US participants were less likely to select a vaccine that was developed outside of the United State, especially from China. Another key finding was that US citizens have higher vaccine acceptability rates when endorsed by public health agencies. However, US citizens did not trust politicians' endorsements for public health issues. (Opel et al., 2020) urge caution against interpreting the results as further evidence of vaccine hesitancy spreading, although they note that "vaccine hesitancy and a reluctance to accept a COVID-19 vaccine are not completely distinct" therefore, public health authorities should communicate and engage with the public in order to encourage people to accept and trust COVID-19 vaccines (Czeisler et al., 2020; Dror et al., 2020). To confirm these

findings, (Kreps et al., 2020) also found that 79% of their sample selected a vaccine that has (1) high efficiency and (2) longer duration of protection from their research.

Another approach by (Lazarus et al., 2021) measured vaccine acceptance against (1) trust and (2) fear of future side effects. Where they found that greater trust in government significantly affected the acceptance rate positively, as did employer advice. They measured a sample from 19 countries which comprised about 55% of the global population, consisting of 53.5% women, 63.3% earned more than \$32 per day, 36.3% had a university degree, and 62.4% were between 25 and 54 years old, which is a similar age representation of the majority of Jordan's population. Populations with higher income levels and education degrees were found to have more positive acceptance rates of the vaccine; while higher trust in government information also showed more positive acceptance as long as the information provided was detailed and clear; such as explaining how vaccines work, as well as how they are developed, from recruitment to regulatory approval based on safety and efficacy. Effective campaigns should also aim to carefully explain a vaccine's level of effectiveness, the time needed for protection (with multiple doses, if required) and the importance of population-wide coverage to achieve public immunity" (Wise et al., 2020; Lazarus et al., 2021).

Age and education seem to be deciding factors in vaccine importance perception where a study by (Tam et al., 2020) measured the differences between older and younger adults; where older people have been prioritized for COVID-19 prevention and treatment. On the other hand, younger people were less likely to comply with prevention practices and social distance (Fisher et al.,

2020). And (Subedi et al., 2021) found that the age range 28–47 years old had the most positive perception of the importance of vaccination, and argued that this age group were mostly with university degrees and have access to information to the internet, which argues that the level of education and access to accurate information are key factors in guiding people to seeing the importance and effectiveness of the COVID-19 vaccination. "The educational status of the participants and geography, however, had no impact on the participants' willingness to receive the COVID-19 vaccine when available. But these younger generations were more acceptable and showed more trust in preventive vaccination against COVID19. (Subedi et al., 2021) concluded by finding that the main two factors for the success of a nationwide campaign, assuming positive inclination towards vaccination was the (1) proper distribution of information about the vaccine and its proper doses, as well as the (2) fluid geographic availability of the vaccine across the country.

Similarly, in the Americas, (Opel et al., 2020) mentioned in their study that to increase the acceptability of a COVID-19 vaccine, US officials need to share transparent data and they should increase informed consent considerations. In addition, they urged frequent and visible communication with the public to build trust and achieve confidence in COVID-19 Vaccines. (Graffigna et al., (2020) studied the main factors that affect citizen decision-making for taking or not taking COVID-19 vaccine. Their study focused on perceived effectiveness, safety and side-effect concerns, vaccine benefits, and where the vaccine was originated. Furthermore, their research studied social factors such as recommendations from family members and health authorities. In addition,

individuals also cared about vaccination cost, vaccine availability, and accessibility.

Not to forget, COVID-19 vaccination programs are conducted under extraordinary media attention and coverage. Therefore the acceptance level can be dynamically influenced by the quality of media content that the vaccine receives. Hence, the level of trust in COVID-19 vaccines must be monitored prior to and after their introduction in different world regions, which will provide information that can help shape the strategies reaching out to the general public and support it in the decision-making process regarding COVID-19 vaccination (Rzymski et al., 2021).

It is evident from this literature review that quite a few researchers looked into the resistance of COVID-19 vaccination from socio and cultural angles, as well as medical angles, including side effects and pre-existing diseases. Not many were found that studied perceived importance and perceived quality, except for the papers found that studied vaccine efficacy rates, which we hope to attempt measuring it in this paper.

Research Methodology

Research Design, Sample

To test for causal relationships between the research variables, the researchers adopt a quantitative method using a cross-sectional online research questionnaire to collect the primary data. A sample of (N=2084) respondents who follow the social media platforms were selected. Therefore, a stratified simple random method was used in this research.

Measures

The self-administered questionnaire was designed based on previous studies (Graffigna et al., 2020; Nindrea et al., 2021; Reiter et al., 2020; Zewude & Siraw, 2021) to examine the influence of perceived vaccine importance (PVI) and perceived quality (PQ) on perceived acceptance of COVID-19 Vaccination. The research questionnaire consists of (1) socio-demographic characteristics, such as age, gender, occupation, working in the medical field, and income; (2) perceived vaccine importance (PVI) and perceived quality (PQ) as independent variables; (3) pre-existing health conditions as a moderator variable; (4) perceived acceptance of COVID-19 Vaccination as a dependent variable. Both English and Arabic statements were presented in the questionnaire. The questionnaire contained five-point Likert scales 1= strongly disagree and 5 strongly agree. The original sources of the main scale items are presented in Table 1.

Table (1) Construct Operationalization

F1	Perceived Vaccine Importance effect on Vaccination Acceptance	Source
1	COVID-19 vaccine is important to my health	Researchers
2	I am likely to take the COVID-19 vaccine to boost my health	Researchers
3	I am likely to depend on the COVID-19 vaccine in improving my health	Researchers

4	COVID-19 vaccination might be an effective way to prevent and control the disease	Reserachers
5	Recommendations from family members influence my decision to take Vaccine	Graffigna et al., (2020)
6	Recommendations from health authorities influence my decision to take Vaccine	Graffigna et al., (2020)

F2	Perceived Quality effect of Quality on Vaccination Acceptance	
1	Perceived vaccine benefits influence my decision to take it	Nindrea et al., (2021) Graffigna et al., (2020)
2	COVID-19 vaccine's side effect influences my decision to take it	Graffigna et al., (2020)
3	The country of origin of the vaccine influence my decision to take the vaccine	Graffigna et al., (2020)
4	Availability of vaccine influences my decision to take it	Graffigna et al., (2020)
5	Accessibility and speed of procedures influence my decision to take the vaccine	Graffigna et al., (2020)
6	Perceived effectiveness and efficacy influence my decision to take the vaccine	Graffigna et al., (2020) Reiter et al., (2020)
7	COVID-19 vaccine's safety influences my decision to take it	Graffigna et al., (2020)
8	Blood clotting which is related to pre-existing health conditions influences my decision to take the vaccine	Zewude & Siraw, (2021)
9	Duration of protection influences my decision to take the vaccine	Reiter et al., (2020)

Moderator

Pre-existing Health Conditions
1) No history of known medical conditions
2) I have a history of certain medical conditions
3) Prefer not to say

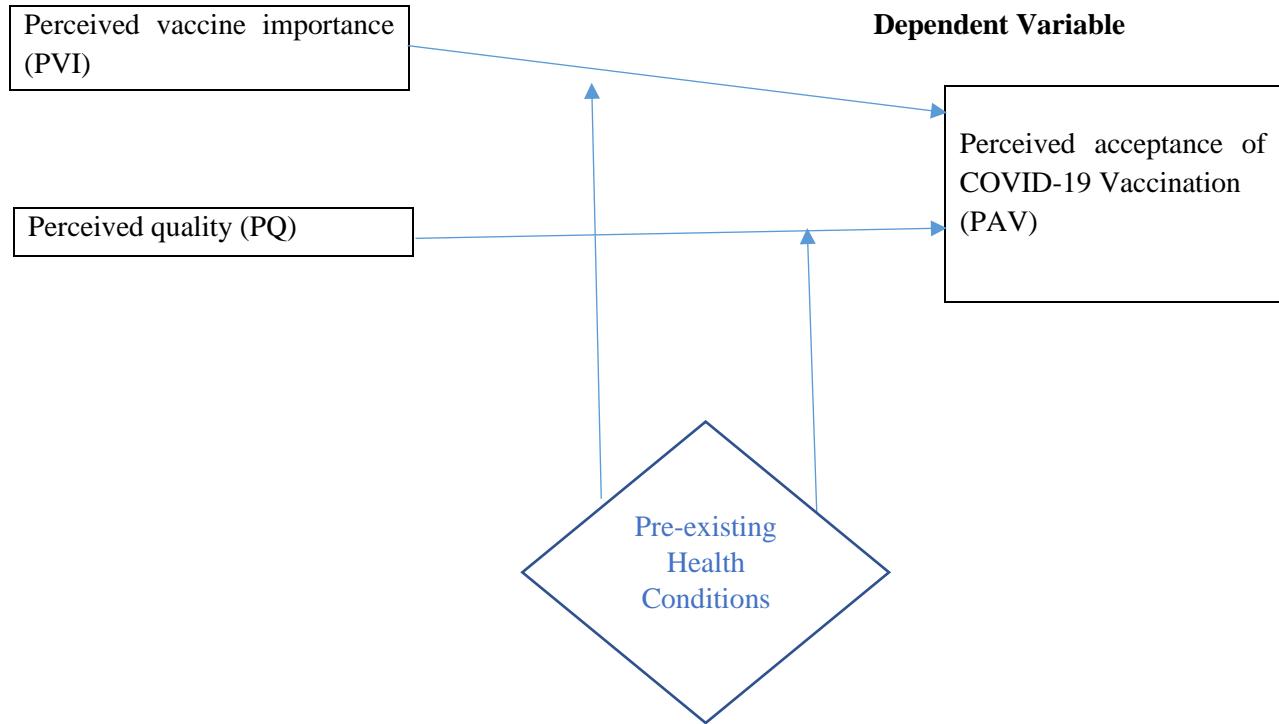
Dependent

How likely will you take a COVID-19 vaccine when it is available?
1 = definitely not take it, 2= not likely to take it, 3 = I don't know, 4 = likely to take it, and 5 = definitely take it

Based on their responses, participants were divided into three groups including

(1) Refusal group, (participants with answers of '1' or '2');

- (2) Hesitancy group (participants with answers of '3');
- (3) Acceptance group (participants with answers of '4' or '5').



Research Hypotheses

H1: Perceived vaccine importance has a significant impact on the perceived acceptance of COVID-19 vaccination at sig. level ≤ 0.05 .

H2: Perceived quality has a significant impact on the perceived acceptance of COVID-19 vaccination at sig. level ≤ 0.05 .

H3: Pre-existing Health conditions have a significant positive impact on the relationship of perceived vaccine importance and perceived acceptance of COVID-19 vaccination at sig. level ≤ 0.05 .

H4: Pre-existing Health conditions have a significant positive impact on the relationship

Research Model

Independent Variables

Dependent Variable

of perceived quality and perceived acceptance of COVID-19 vaccination at sig. level ≤ 0.05 .

Research Results

I. Demographic examination

Despite the fact that the demographical age and gender factors are of minimal impact on the retrieved data, the researchers managed to collect data from different age groups, both gender, occupation, income level, working in the medical field industry, and pre-existing health conditions. Table (2) describes the demographic distribution of the research sample

Table (2): Demographic Characteristics

		Frequency	Percentage
Age	18 – 30	1110	53.3
	31-40	456	21.9
	41-50	312	15.0
	51-60	150	7.2
	61+	56	2.7
	Total	2084	100
Gender	Female	1182	56.7
	Male	902	43.3
	Total	2084	100
Occupation	Students	780	37.4
	Unemployed	260	12.5
	Retired	132	6.3
	Part-time employee	114	5.5
	Full-time employee	798	38.3
	Total	2084	100
Working in medical field	No	1818	87.2
	Yes	266	12.8
	Total	2084	100
Income	300 JD and less	822	39.4
	301-700	504	24.2
	701-1100	296	14.2
	1101-1500	162	7.8
	More than 1500	300	14.4
	Total	2084	100
Health conditions	No history of known medical conditions	1236	59.3
	I have a history with certain medical conditions	756	36.3
	Prefer not to say	92	4.4
	Total	2084	100

2. Descriptive Analysis

The following test results are presented as shown in table (3); descriptive analysis for the answers of all factors affecting the

acceptance of a COVID-19 vaccine and pre-existing health conditions as a moderating factor, and perceived acceptance of COVID-19 vaccination (PAV) as a dependent factor.

Table (3): Descriptive Analysis Table

Items	Numbers	Mean	SD
PVI	2084	3.74	0.930
PQ	2084	4.61	0.913
HC	2084	3.72	0.926
PAV	2084	3.52	0.895

The descriptive statistics offered in Table 3 pointed to a positive disposition towards the variables measured.

Reliability Analysis

Reliability analysis is defined by Wilkinson & the Task Force on Statistical Inference (1999), p. 598 as a psychometric property of a particular sample's response to a measure that is monitored under specific scenarios and conditions. Particularly, the recommended scale shall exhibit high extents of internal consistency in reference to Cronbach alpha or composite reliability (Hair et al. 2011, P. 75).

In fact, the accepted and agreed upon, percentage of Cronbach alpha is (70%), whilst the composite reliability's advised percentage is (80%) (Streiner, 2003, P. 220).

The current research shows that Cronbach alpha exceeded (70%) in the seven scales variables (e.g. 0.792-0.831), and the composite reliability of each scale was above (80%) as of (0.827-0.907). Moreover, it has been suggested that convergent validity is

related to the level of harmony and agreement between a conceptual theory, such as the latent construct and its monitoring tool that may be referred to as a number of elements that measure the implicit construct (Hair et al. 2010, P. 104). The aforementioned validity is reflected through the AVE (average variance extracted) which indicates the shared average variance between a variable and the items related to it.

Table (4) presents the AVE of the four variables which is more than the recommended threshold of (50%). More specifically, the AVE of the four variables was in the range of (0.583-0.621), indicating that the items of each scale are indeed related. Depending on the outcomes of these tests, the instrument of the study is useful, which allows academics to manage the statistical analysis.

Table (4) Convergent Validity and Internal Consistency of Survey

Variables	Cronbach alpha (α)	AVE	CR
PVI	0.801	0.620	0.841
PQ	0.803	0.621	0.842
HC	0.799	0.610	0.827
PAV	0.792	0.583	0.834

Convergent and Discriminant Validity

The assessment of Discriminant Validity, as suggested by Fornell & Larcker, (1981) is possible when comparing and contrasting the correlation between the coefficients of the construct along with the square roots of AVE, which ought to be higher than that of the other constructs, paving the way for the output results of the study model to be disseminated in the study population.

As stated in table (5), the correlation between the coefficients of the construct are less than the square roots of AVE, reflecting its loadings to their latent construct to be higher than that of other constructs. As a consequence, the discriminant validity of the research model is proven to be satisfactory, enabling the possibility of reflecting the results derived from the study model on the study population. Herein, the discriminant validity is not an issue of concern.

Table (5) Discriminant Validity

Variables	PVI	PQ	HC	PAV
PVI	0.807			
PQ	0.401	0.810		
HC	0.416	0.363	0.801	
PAV	0.392	0.352	0.310	0.813

Results of the Standard Structural Model

The results of the analysis about the effects of PVI, PQ on PAV are shown in Table 6.

Table (6) Hypotheses Results

Hypothesis	Path	Estimate	β	S.E.	t-Value	R ²	P-Value
H1	PVI → PAV	0.312	0.314	0.042	5.127	0.31	0.002
H2	PQ → PAV	0.351	0.354	0.040	4.436	0.38	0.006

First, hypothesis **H1**, “Perceived vaccine importance has a significant impact on the perceived acceptance of COVID-19 vaccination at sig. level ≤ 0.05 ”, predicts a positive path from PVI to PAV.

The results of the analysis support this hypothesis (Sig < 0.05, = 0.002; T-value= 5.127; β Coefficient =0.314). Accordingly,

the hypothesis is accepted indicating that if the Jordanian community perceived that vaccine is important, then perceived acceptance of COVID-19 vaccination will increase.

Second hypothesis **H2**, “Perceived quality has a significant impact on the perceived

acceptance of COVID-19 vaccination at sig. level ≤ 0.05 ", predicts a positive path from PQ to PAV.

The results of the analysis support this hypothesis (Sig < 0.05, = 0.006; T-value= 4.436; β Coefficient =0.354). Accordingly, the hypothesis is accepted indicating that if the Jordanian community perceived the high quality of vaccine, then perceived acceptance of COVID-19 vaccination will increase.

Results of the Moderating Effects of Pre-Existing Health Conditions

H3: Pre-existing Health conditions have a significant positive impact on the relationship

of perceived vaccine importance and perceived acceptance of COVID-19 vaccination at sig. level ≤ 0.05 .

H4: Pre-existing Health conditions have a significant positive impact on the relationship of perceived quality and perceived acceptance of COVID-19 vaccination at sig. level ≤ 0.05 .

The study also sought to test for the moderating effect of pre-existing health conditions. To achieve this, the moderation SPSS Amos plugin was made use of and the results for these indirect effects are presented in Table 7.

Table 7: SEM Moderation – Indirect Path Coefficients

Path	Estimate	β	S.E.	C.R	R ²	P-Value
PVI → PAV * HC	0.422	0.398	0.041	7.247	0.420	0.001
PQ→ PAV * HC	0.416	0.414	0.048	7.356	0.442	0.000

H3: Pre-existing Health Conditions have a significant positive impact on the relationship of perceived vaccine importance and perceived acceptance of COVID-19 vaccination at sig. level ≤ 0.05 . The p-value was less than 0.05 for the moderation effect of pre-existing health conditions on the relationship between perceived vaccine importance and perceived acceptance of COVID-19 vaccination (CR = 7.247, p = 0.001, R²= 0.420). These results, therefore, support the alternative hypothesis stating that there was a statistically significant moderation effect of pre-existing health conditions on the relationship between perceived vaccine importance and perceived acceptance of COVID-19 vaccination. Since the R² value was 0.420, these results show that 42% of the variation in perceived

acceptance of COVID-19 vaccination was indirectly explained by pre-existing health conditions.

H4: Pre-existing Health Conditions have a significant positive impact on the relationship of perceived quality and perceived acceptance of COVID-19 vaccination at sig. level ≤ 0.05 .

The p-value was less than 0.05 for the moderation effect of pre-existing health conditions on the relationship between perceived quality and perceived acceptance of COVID-19 vaccination (CR = 7.356, p = 0.000, R²= 0.442). These results, therefore, support the alternative hypothesis stating that there was a statistically significant moderation effect of pre-existing health conditions on the relationship between

perceived quality and perceived acceptance of COVID-19 vaccination. Since the R^2 value was 0.442, these results show that 44.2% of the variation in perceived acceptance of COVID-19 vaccination was indirectly explained by pre-existing health conditions.

Research Discussion

This study attempted to measure the acceptance rate of Jordan's population of the COVID-19 vaccine. The research confirmed a high rate of acceptance during the pandemic period. The higher the level of income and education status, the higher the acceptance rate was. Two out of two acceptance drivers affect perceived acceptance of COVID-19 vaccination namely the importance and the quality of the vaccine. The results of the study analysis support the main hypotheses (H1). The most prominent factors that drove the citizens to take the vaccine were improved control over the disease spread, in addition to improved health benefits, especially for the individuals with chronic diseases. Other factors that drove citizens to take the vaccine were positive recommendations of family, friends, and/or colleagues, in addition to positive recommendations by the government and official health officials. The study confirmed positive inclinations towards the vaccine if (1) the government provides trusted information through effective media campaigns with true details about the vaccine and its effectiveness. Additionally, (2) positive word of mouth by trusted individuals positively influenced the inclination towards taking the vaccine. (Al Khasawneh et al., 2021). The result of the study analysis also supports the main hypotheses (H2). The analysis also identified that the quality factors were controlled by the benefits, side-effects, country of origin, efficacy, safety, and duration of protection of the vaccine. Lastly, the study confirmed the hypotheses

(H3) and (H4) as the Jordanian population stated that they would gain improved health conditions after taking the COVID-19 vaccine. This research also confirmed the positive role of importance and quality of vaccine factors moderated by pre-existing health conditions factors on perceived acceptance of COVID-19 vaccination among Jordanian people. The success of a COVID-19 vaccine promotion campaign depends largely on government health officials understanding what factors would contribute to vaccine acceptance and what factors would result in vaccine rejection. Hence Jordanian health officials need to communicate the benefit of vaccines, safety concerns, side effects, vaccine accessibility, efficacy, and availability in order to change the Jordanian citizens' knowledge attitude and practices towards the acceptance of the COVID-19 vaccine (Gadot et al., 2020).

The study results recommend that (1) FDA & MOH, (2) national authorization of COVID-19 vaccines, (3) employer force and recommendations, (4) friends and family, and (5) positive word-of-mouth can all play important roles in vaccination acceptance and increase of the percentage of vaccinated Jordanian citizens which was consistent with previous studies. Moreover, after the high number of deaths among the Jordanian population, and the hard conditions that people suffered during the COVID-19 pandemic years, the majority of Jordanian citizens changed their attitude toward taking COVID-19 vaccination to be positive after being hesitant at first. Thus, a high percentage of acceptance and positive attitude toward COVID-19 vaccination reflected in the high demand among the Jordanian people for COVID-19 vaccines and the high recognition of the importance of vaccines in order to control the pandemic disease (Tian et al., 2020). Furthermore,

people started to think seriously about the pros and cons of the vaccines (Karafillakis & Larson, 2017). Residents of Jordan felt the negative impact on their daily life, work, income, and the disease severity on their health and their loved ones. Hence, the majority of Jordanian citizens thought that the COVID-19 vaccine is an effective way to control and prevent the coronavirus from spreading (Leung et al., 2020). The positive behaviors and attitudes toward vaccines explain the high percentage of vaccine acceptance (Kraemer et al., 2020). Jordanian adults and married citizens realized the benefit of COVID-19 vaccines compared to the risk associated with their health and lifestyle (Bone et al., 2010).

Conclusion

This research reflected the positive role of the perceived importance and the quality of a vaccine on the perceived acceptance of COVID-19 vaccination among the Jordanian people. The study findings presented a good start for the process of achieving the needed coverage rate to ensure herd-immunity among the residents of Jordan. Also, these results proved beneficial for formulating effective policies and strategies for the Jordanian health and vaccine market. Firstly, by triggering the role of word-of-mouth by social ties that may influence acceptance of the vaccine. Secondly, the government and health officials in Jordan should be announcing the benefit of the vaccines, and improving the accessibility and availability in terms of, physical locations, time, information, and procedural access to vaccines. Thirdly, the Jordanian Ministry of Health should communicate to people any public concern such as vaccine safety, benefits, side-effects, country of origin, efficacy, and duration of protection. Public concern about vaccine safety has frequently been reported as the major obstacle to

vaccination decision-making which will be overcome if the above mentioned steps are followed. Some of Jordan's residents delay their vaccination until the safety of the COVID-19 vaccine is confirmed. Therefore, Jordanian health officials need to use all the available tools to persuade people to take the vaccine and to end all hesitations. Also, negative testimonies from doctors and pharmaceuticals would lower the confidence among public concerns.

To be proactive and respond efficiently to any possible epidemic or pandemics in the future, health governing bodies in Jordan (MOH, Royal Medical Services, and Private Sector) should take into consideration training programs in terms of vaccination and continuous education for health service providers in general and health providers who are working in Epidemiology field in particular.

Acknowledgements

The authors would like to thank Princess Sumaya University for Technology (PSUT) and Applied Science Private University (ASU) for their continuous support.

There is no conflict of interest.

This paper did not receive any funding.

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