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The Determinates of Hesitancy of Taking Covid-19 Vaccine in Jordan

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Abstract

This study aimed to identify the determinants that led to the hesitancy of taking the corona vaccine. In order to achieve the objective of the study, a questionnaire was distributed to residents in Irbid city. The study sample amounted to (519) residents selected according to a simple random sampling technique. The crosstab analysis and one sample T. test and regression analysis were used in order to test hypotheses of the study. The study reached many results, most notably: There is a statistically significant relationship between the hesitancy of taking the Corona vaccine and both ages, marital status, infection with the virus, taking the vaccine, and sources of information about the Corona virus. The combined determinants (beliefs and fears) explained (28.4%) of the hesitation in taking the Corona vaccine, and the remaining percentage that was not explained in this model is attributed to other independent variables that were not addressed in this study. The study recommended

community members not to rely on social media sources as a source for obtaining information related to COVID-19 vaccine, especially as it is tainted by many rumours and errors.

Keywords: Covid-19, Corona Vaccine, determinants, beliefs, fears

1. Introduction

Coronavirus disease-19 (COVID-19), which first appeared in Wuhan, China, at the end of December 2019 and has rapidly spread worldwide into a pandemic, is an emerging global health threat (Umakanthan et al., 2020). According to the World Health Organization (as of August 20, 2021), the COVID-19 pandemic has resulted in more than 209.8 million confirmed cases and more than 4.4 million deaths worldwide (World Health Organization, n.d.). One of the most important ways to reduce and control the effects of the ongoing COVID-19 pandemic is to develop and provide an effective vaccine that can help reduce hospitalization, intensive care needs, and person-to-person transmission (Sallam, Dababseh, Eid, Al-Mahzoum, et al., 2021a). However, In Jordan, since the first dose of the COVID-19 vaccine was given on January 13, 2021, 2.64 million people have been fully vaccinated out of the total population and a total of 5.95 million doses have been administered, according to WHO statistics on August 17, 2021, which is still far from achieving herd immunity (World Health Organization, n.d.).

The main Determinant to the vaccination process may be the public's hesitation to take the vaccine, as an increase in vaccine refusal has been reported in recent years. Also, hesitation about vaccines has been listed by the World Health Organization as one of the top ten global health threats (Sallam, Dababseh, Eid, Al-Mahzoum, et al., 2021a)(Wang et al., 2021). Several studies have shown many factors that lead people to reluctance to accept new vaccines. These factors include lack of information among people about the importance of vaccines, mistrust of health systems, and doubts about the effectiveness and safety of the vaccine (Al-Mohaithef & Padhi, 2020). In addition to the factors related to the beliefs circulating among members of society in various sources of transmission of information, and the consequences of these beliefs from fear of taking a corona vaccine.

Therefore, this study came to know the most important determinants to accepting the COVID19 vaccine in Jordan by testing the relationship between the hesitation of taking the corona vaccine with demographic information, previous infection with COVID19, death of an infected person in the family, chronic disease, and the source of information about the pandemic. Furthermore, we aim to find out the role and effect of beliefs and fears about the virus and the vaccine as major determinants for vaccine acceptance and their impact on the hesitation of taking it.

The importance of this study lies in knowing the most important determinants of hesitation of taking the corona vaccine, to provide public health officials and decision makers with the data necessary to find viable solutions to these determinants and develop plans that contribute to raising awareness of the importance of the vaccine and to develop appropriate vaccination strategies and programs against COVID-19. Thus, getting rid of all the economic and health problems resulting from the procedures associated with the Corona virus and the return of

life to what it was before the virus in terms of progress and prosperity.

Finally, this study contributes to enriching Arab libraries with new research related to the COVID19, in addition to studying a new variables and phenomenon that was not previously known in a new population located in northern Jordan (Irbid), it also contributed to obtaining results related to a recent period of time compared to previous studies.

2. Method

According to the nature of the study, and the information required to achieve its objectives, the study relied on the descriptive survey method. In this section, the study's methodology, population, sample, and instruments will be presented, as well as the appropriate statistical methods necessary for data processing and analysis.

2.1 Study Population and Sample

The study population consisted of the residents in Irbid city. The study sample amounted to (519) residents selected according to simple random sampling technique. The questionnaires were distributed to residents by social media and then collected from them. All of the (519) questionnaires were subjected to statistical analysis.

2.2 Study Instruments

The study relied on a questionnaire to obtain study data and test its hypotheses. It consisted of two parts the first part consists from (9) non-continuous variables which are: (1) Gender, (2) Age group, (3) Marital status, (4) Educational level, (5) Chronic diseases, (6) Got corona virus, (7) received Corona vaccine, (8) Corona death, (9) source of corona virus information, and these nine variables related with dependent variable which is the hesitation of taking the Corona vaccine.

The first part of study variables measures according to table (1):

Table 1. Measurements the variables in the first part of the study

Study variables	Variable measurement
Gender	1 = “Male”
	2 = “Female”
Age Group	1 = “18<25”
	2 = “25<35”
	3 = “35<45”
	3 = “>45”
Marital status	1 = “Single”
	2 = “Married”
Educational level	1 = “High school”
	2 = “diploma”
	3 = “Bachelor’s degree”
	4 = “Master or PhD”

Chronic diseases	1 = “Yes” 2 = “No”
Got corona virus	1 = “Yes” 2 = “No”
Received Corona vaccine	1 = “Yes” 2 = “No”
Corona death	1 = “Yes” 2 = “No"
Source of corona virus information	1= "The World Health Organization or the Ministry of Health" 2="Doctors working in the health field" 3="Doctors working in the health field" 4="local media" 5="Friends and Relatives"
Hesitation of taking the Corona vaccine.	1 = “Yes” 2 = “No"

The second part of study variables related with determinants of accepting the corona vaccine, which divided on two main determinants related to Beliefs, and Fear of accepting the corona vaccine, these main determinants measures according to table (2):

Table 2. Items of the second part in the measurement study

Number of Items	The dimension
6	Beliefs
8	Fear of accepting the corona vaccine
14	**All determinants**

To analyze the data on the second part variables, (Beliefs, and Fear), it was relied on the five-point Likert scale to answer the questions, as shown in Table (3):

Table 3. Study scale test to believes and fears variables

Degree	Degree level
5	Very high agree
4	Agree
3	Moderate agree
2	Disagree
1	Strongly disagree

2.3 Statistical Methods

To achieve the objectives of the study and analyze the collected data, the researcher encoded the data and entered it into the computer using the Statistical Package For Social Sciences (SPSS). The set of statistical methods the study used was:

- Frequency was used to describe the characteristics of the study sample, the frequencies of those to whom the study tool was distributed.

- Percent was used to determine the percentage of frequencies with regard to describing the characteristics of the study sample.

- The arithmetic mean (Mean) was used to calculate the average answer for each item of the questionnaire, as well as the arithmetic mean for all items related with each dimension of the study.

- The crosstabs methods (chi-square) relied on to test the study hypothesis as all the study variables were non-continuous and other modalities of comparisons could not be used (such as the t test).

- In the case of a significant p value in the chi-square test ($p \leq 0.05$) the alternative hypothesis will be accepted otherwise the null hypothesis will be accepted.

- One sample t test to find out the difference between the average of study determinants items and the test average of (3) for the purpose of determining which determinants items related to beliefs and fear consider significance determinants of hesitation of taking the Corona vaccine.

- Multiple linear regression equation to test the hypotheses related to the effect of the independent variable on the dependent variable. Testing the impact of beliefs and fear on the hesitation of taking the Corona vaccine which is represented in the following equation:

$$HE=\alpha 0+\beta 1BE+\beta 2FE+\epsilon$$

Where:

HE: Hesitation of taking the Corona vaccine

BE: Beliefs

FE: Fears of accepting the corona vaccine

$\beta 1, \beta 2$: regression coefficients.

ϵ: Margin of the regression error.

3. Results

This section includes a presentation of the statistical results based on the data analyzed in the Statistical Package For Social Sciences (SPSS) program, which were as follows:

3.1 Demographic characteristics and study sample Information Analysis:

The demographic characteristics and study sample information are shown in table (4):

Table 4. The demographic characteristics of study sample and their information

Determinants	Number (n)	Percentage (%)
Age		
18-25	209	40.3%
26-35	76	14.6%
36-45	130	25%
Above 46	104	20%
Total	519	100%
Gender		
Female	353	68%
Male	166	32%
Total	519	100%
Marital statue		
Single	225	43.4%
Married	294	56.6%
Total	519	100%
Education level		
High school	60	11.6%
Diploma	35	6.7%
BA	334	64.4%
Postgraduate	90	17.3%
Total	519	100%
Having a chronic disease		
Yes	67	13%
No	452	87%
Total	519	100%
Get infected by COVID-19 virus		
Yes	171	33%
No	348	67%
Total	519	100%
Get vaccinated by COVID-19 virus vaccine		
Yes	377	73%
No	142	27%

Total	519	100%
Family death due to COVID-19 virus infection		
Yes	82	15.8%
No	436	84.2%
Total	519	100%
Opponents or hesitant to take COVID-19 virus vaccine		
Yes	184	35.3%
No	336	64.7%
Total	519	100%
Source of information about COVID-19 vaccine		
World health organization	168	32.4%
Health care workers	127	24.5%
Social media	130	25%
Local media	57	11%
Friends and relatives	37	7.1%
Total	519	100%

Referring to table (4), we show the following results:

Most of the respondents in the sample were young people 18-25 with a percentage of 40.3%. It is indicted that the study samples aren't from the category that bears the symptoms of corona disease compared to the elderly, but they need to be vaccinated to protect them self from the virus.

Females in the study sample were the majority with a percentage of 68%, which led to the marital status of the respondents to the study, most of whom are married, at a rate of 56.6%.

The scientific certificates held by the study sample members with a bachelor's degree were concentrated by 64.4%, which is an indication that the members of the study sample have academic qualifications that enables them to answer the questionnaire.

It was found that most of the study sample respondents do not have chronic diseases at a rate of 87%, as most of the study members are young people as mentioned previously; in addition to that most of them were infected to the virus by 73%.

Most of the respondents did not have deaths in their family members from COVID-19 disease with a percent 84% and this explained by the fact that COVID-19 disease spread was minimal in Jordan and death cases were under control.

The respondents take their information about COVID-19 from World Health Organization or the ministry of health and most of them are young and having sufficient academic qualifications (bachelor's degree), so they can rely on reliable sources of information about COVID-19. Most of the respondents are not hesitating about taking COVID-19 vaccine with a percent 64% and the rest with a percent 36%are hesitating about taking the vaccine.

3.2 Testing Hypotheses

The study relied on many statistical methods to test its hypotheses, including:

3.2.1 Crosstab Analysis

The crosstabs methods (chi-square) relied on to test the study hypothesis related to non-continuous variables related to demographic characteristics of study sample and their information, so in the case of a significant p value in the chi-square test ($p \leq 0.05$) the alternative hypothesis will be accepted otherwise the null hypothesis will be accepted. The following results were obtained:

Table 5. crosstab analysis to test demographic characteristics and study sample information

Hypotheses	**Asymptotic Significance** (2-sided)	**Person Chi-Square**	**Result**
1. There is a relationship between Gender and hesitation of taking the Corona vaccine	2.824[a]	0.093	Not Statistically significant
2.There is a relationship between age group and hesitancy of taking the Corona vaccine	11.003[a]	0.012	Statistically significant
3. There is a relationship between marital status and hesitancy of taking the Corona vaccine.	6.112[a]	0.013	Statistically significant
4. There is a relationship between education level and hesitancy of taking the Corona vaccine.	1.800[a]	0.615	Not statistically significant
5. There is a relationship between having a chronic diseases and hesitancy of taking the Corona vaccine.	0.142[a]	0.706	Not statistically significant
6. There is a relationship between	4.379[a]	0.036	Statistically significant

infection with the virus and hesitancy of taking the Corona vaccine.			
7. There is a relationship between got corona vaccine and hesitancy of taking the Corona vaccine.	147.491[a]	0.000	Statistically significant
8. There is a relationship between family death and hesitancy of taking the Corona vaccine..	0.972[a]	0.324	Not statistically significant
9. There is a relationship between the source of information and hesitancy of taking the Corona vaccine.	11.021[a]	0.026	Statistically significant

Hypothesis (1): There is a relationship between Gender and hesitation of taking the Corona vaccine.

The p value of Person Chi-Square was 2.844 and sig was 0.093 which means that there is no statistically significant relation between Gender and hesitation of taking the Corona vaccine, in the sense that the gender variable hasn't had relation with hesitation of taking the Corona vaccine.

Hypothesis (2): There is a relationship between age group and hesitation of taking the Corona vaccine.

The p value of Person Chi-Square was 11.003 and sig was 0.012 which means that there is statistically significant relation between age and hesitation of taking the Corona vaccine.

This relationship can be explained by referring to Appendix No. (1) related to crosstab test, it is noted that the number of sample members of different age groups who answered "Yes" (hesitancy to take the vaccine) reached 35% (183/519), and the rest of the percentage belongs to respondents from all age groups who answered "No" and that is mean there is hesitation of taking the Corona vaccine related to age group variable.

Hypothesis (3): There is a relationship between marital status and hesitancy of taking the Corona vaccine.

There is statistically significant relation between marital status and hesitancy of taking the Corona vaccine depending on the p value of Person Chi-Square and Asymptotic Significance (6.112 and 0.013 respectively). This relationship can be explained by referring to Appendix No.

(1) related to crosstab test, it is noted that the number of sample members who answered "Yes" (hesitancy to take the vaccine) and was married reached 22.5% (117/519), and who was singled reached 13% (66/519), while the number of sample members who answered "No" and was married reached 34% (177/519) and who was singled reached 30.6% (159/519) that is mean there is a hesitation of taking the Corona vaccine related to marital status variable.

Hypothesis (4): There is a relationship between education level and hesitancy of taking the Corona vaccine.

There is no statistically significant relation between education level and hesitancy of taking the Corona vaccine depending on the p value of person Chi-Square and asymptotic significance (1.800 and 0.615 respectively) which means that the education level variable haven't had relation with hesitation of taking the Corona vaccine.

Hypothesis (5): There is a relationship between having a chronic diseases and hesitancy of taking the Corona vaccine.

The P value of person chi-square was 0.142 and the significance was 0.706 which means that there is no statistically significant relationship between chronic diseases and hesitancy of taking the Corona vaccine.

Hypothesis (6): There is a relationship between infection with the virus and hesitancy of taking the Corona vaccine.

The P value of person chi-square was 4.379 and the significance was 0.036 which means that there is statistically significant relation between infection with the virus and hesitation of taking the Corona vaccine.

This relationship can be explained by referring to Appendix No.(1) related to crosstab test ,it is noted that the number of sample members of different infectious of the virus groups who answered "Yes" (hesitancy to take the vaccine) reached 13.68% (17/519), and who answered "No" reach 19.2% (100/519) ,whereas the number of sample members that not infectious with the virus who answered "Yes" 21.57% (112/519) and who answered "No" reached 45.47% (236/519) that means there is a hesitation of taking Corona vaccine related to infection with the virus.

Hypothesis (7): There is a relationship between infections with the hesitancy of taking the Corona vaccine.

The p value of Person Chi-Square was 147.491 and the significance was 0.000 which means that there is statistically significant relation between infection and hesitation of taking the Corona vaccine.

This relationship can be explained by referring to Appendix No. (1) related to crosstab test, it is noted that the percentage of sample members that got Corona vaccine who answered "Yes" (hesitancy to take the vaccine) reached 14.258% (74/519), and who answered "No" reached 58.381% (303/519), whereas the number of sample members that not got Corona vaccine who answered "Yes" reached 21.% (109/519) and who answered "NO" reached 6.36% (33/519) that mean there is hesitation of taking the Corona vaccine related to the vaccination being getting.

Hypothesis (8): There is a relationship between family death and hesitancy of taking the Corona vaccine.

The p value of Person Chi-Square was 0.972 and the significance was 0.324 which means that there is no statistically significant relation between family death and hesitation of taking the Corona vaccine, in the sense that the family death hasn't had relation with hesitation of taking the Corona vaccine.

Hypothesis (9): There is a relationship between the source of information and hesitancy of taking the Corona vaccine.

The p value of Person Chi-Square was 11.021 and the significance was 0.026 which means that there is statistically significant relation between the source of information and hesitation of taking the Corona vaccine.

This relationship can be explained by referring to Appendix No. (1) related to crosstab test, it is noted that the percentage of sample members that received information from various sources about corona vaccine from who answered "Yes" (hesitancy to take the vaccine) reached 35.26% (183/519), the resident that answered "No" (hesitancy to take the vaccine) reached 65.74% (336/519). That means there is hesitation of taking the Corona vaccine related to the variable source of information.

3.2.2 One Sample T Test Analysis

The one-sample T test was used to analyze the items of the questionnaire related to believes and fears, and in the sense that the mean of the item greater than 3 and the significance value less than 5%, meaning that the respondents agree with its content. And in case it is mean of the item less than 3 and the significance value less than 5%, meaning that the respondents didn't agree with its content.

The results of the one-sample t-test analysis to the beliefs as determinants of hesitation to take the Corona virus was shown in the tables (6) below:

Table 6. One sample t-test result to beliefs items lead to hesitation of taking the Corona vaccine

Determents related to beliefs items	Mean	Standard deviation	t	Significant
I think the vaccine is a way to implant people with microchips to control them	2.39	1.175	-11.821	0.00
I think that the vaccine is not necessary because the Corona virus does not pose a serious threat to health	2.59	1.219	-7.566	0.00
I think the vaccine contains a live strain of the virus	3.10	1.177	1.904	0.05
I think the vaccine was created before the pandemic to increase sales of the vaccines	3.02	1.278	0.344	0.73
I think the corona vaccine was designed to reduce the world's population	2.85	1.286	-2.630	0.009
I don't think the vaccine protects enough from infection with the virus	3.63	1.201	11.856	0.00

Referring to table number (6), it was found that the respondents did not agree with all the beliefs presented in the study, where the mean was less than (3) with a significant value (significance <0.05), or the mean was close to (3) with (significance >0.05). Except for the last determinant of: "I don't think the vaccine protects enough from infection with the vaccine" Where the mean answers of the sample by individuals reached 3.63 with a

significant value (0.000).

This means that respondents believe that the main determinant related to beliefs is related to the inability of the vaccine to protect against infection with the Coronavirus, and the researchers explained this by that the results of taking the vaccine did not appear for the members who received the vaccine previously. And so that the consequences of taking the vaccine reinforce the decisions of its acceptance or rejection in the future.

The results of the one-sample T test analysis to the fears as determinants of hesitation to take the Corona virus was shown in the tables (7) below:

Table 7. One sample t test result to fears items lead to hesitation of taking the Corona vaccine

Determents related to fears items	Mean	Standard deviation	T	Sig
I am afraid about the possible side effects of the corona vaccine (swelling or redness at the injection site, headache, fever ....)	3.45	1.22	8.38	0.000
I feel scared because of what is being published on social media about the horrific deaths	3.25	1.280	4.42	0.000
I feel afraid because of what is being circulated that the vaccine causes sterility and autism and modifies human genes	3.06	1.334	1.02	0.308
I am afraid of the speed of innovation and production of vaccines related to Corona compared to the vaccines that were previously produced	3.44	1.270	7.91	0.000
A member of my family or relatives suffered severe effects or died after receiving the vaccine	2.35	1.281	-11.61	0.000
I am afraid because there is not enough information about the vaccine	3.46	1.221	8.51	0.000
I feel distrustful of the information from the health sector	3.45	1.277	8.04	0.000
I am afraid of receiving one type of vaccination and not another (AstraZeneca, Pfizer...)	3.27	1.288	4.73	0.000

From table (7) it was found that the respondents agree with all the fears presented in the study, where the mean was more than (3) with a significant value (significance <0.05), with the exception of the determinant related to the fact that one of my family members or relatives suffered from severe symptoms or death after receiving the vaccine, where the mean reached

(2.35) at a significant (significance <0.05), which means that respondents do not agree with this determinant, and researchers believe that this is an indication that the disease has not spread widely in Irbid city, and that the number of deaths is still under control.

Also referring to Table (7) that the determinant related to "I am afraid of the lack of sufficient information about the vaccine" obtained the highest degree of agree with a mean of (3.46) at a significant (significance <0.05), and the researchers explain that the lack of sufficient information about the vaccine was one of the most important determinants associated with fear, which leads to hesitancy to accept the vaccine among members of the community.

3.2.3 Regression Analysis

In order to test the effect of beliefs and fears on hesitation to take the Corona virus the multiple regressions were used and the results were shown in the tables (8) below:

Table 8. The results of applying the multiple regression equation to study the effect of beliefs and fear on the hesitation of taking the corona vaccine.

Independent variables	**Unstandardized Coefficients**		**Standardized Coefficients**			**R**	**R^2**	**Adjusted R^2**	**F**	**Sig**
	B	Std. Error	Beta	**T**	**Sig**					
(Constant)	2.553	0.066		38.83	0.000	0.535	0.286	0.284	103.576	0.000
Beliefs			-0.28	-5.56	0.000					
Fears			-0.30	-5.97	0.000					

Referring to Table (8), the test value (F) amounted to (103.576) with statistical significance (0.00), which is a statistically significant value that indicates the acceptance of the regression model and the ability of the independent variables (beliefs and fears) together to influence the dependent variable (hesitancy of taking the corona vaccine).

It appears from Table (8) that there is a significant effect at the level ($\alpha \leq 0.05$) of the beliefs and fears on hesitancy of taking the corona vaccine, as the value of the correlation coefficient (R) reached (0.535), which is a statistically significant value and indicates the degree of statistical correlation between the independent variables and the dependent variable, The value of (Adjusted R^2) was reached (0.284), which is a statistically significant value that explains the ability of the determinants (beliefs and fears) to influence the hesitancy of taking the Corona vaccine, meaning the determinants combined (beliefs and fears) explain (28.4%) of the hesitancy of taking the Corona vaccine. The remaining percentage that is interpreted in this model is attributed to other independent variables that were not addressed in this study.

With regard to testing the hypotheses, the results showed the following:

Hypothesis (10): There is a significant effect of beliefs on the hesitancy of taking the corona vaccine at the level ($\alpha \leq 0.05$).

Where the value of T (-5.56) is significant at (0.000), which are negative and statistically significant values, and therefore the first sub-hypothesis is accepted by the alternative assumption, which states: "There is a significant effect at the ($\alpha \leq 0.05$) level of beliefs on the hesitancy of taking the corona vaccine". This means that beliefs negatively affect the

hesitancy to take the corona vaccine.

Hypothesis (11): There is a significant effect of fears on the hesitancy of taking the corona vaccine at the level ($\alpha \leq 0.05$).

Where the value of T (-5.97) is significant (0.000), which are negative and statistically significant values, and therefore the first sub-hypothesis is accepted by the alternative assumption, which states: "There is a significant effect at the ($\alpha \leq 0.05$) level of fear on the hesitancy of taking the corona vaccine". This means that fears negatively affect the hesitancy to take the corona vaccine.

4. Discussion

After reviewing the results of the statistical analysis of the study data, the following most important points will be discussed:

There is no statistically significant relationship between COVID-19 vaccine hesitancy and gender, education level, having chronic disease, family death from COVID-19 infection. These results agreed with the results of research in Hong-Kong-China in which it appears that there are no relationships between having chronic disease and COVID-19 vaccine hesitancy (Wang et al., 2021), also it agreed with the Saudi Arabia results research in which appears that there are no relationships between education level, gender and COVID-19 vaccine hesitancy (Al-Mohaithef & Padhi, 2020).

There is a statistically significant relationship between COVID-19 vaccine hesitancy and age, marital status, infection with the virus, taking the vaccine, sources of receiving information about the virus. This result agreed with the results of which was performed across 19 countries and shows that there is a relation between acceptance to take COVID-19 vaccine and the source of information. (Lazarus et al., 2021). Also, it agrees with (Al-Mohaithef & Padhi, 2020) study which shows that respondents reporting higher levels of trust in information from government sources were more likely to accept a vaccine, as well as how they are developed that make people have more trust in government. Furthermore, the results of our study agreed with the results of (Al-Mohaithef & Padhi, 2020) study in Saudi Arabia and shows that willingness to accept the COVID-19 vaccine is relatively high among older age groups, being married participants.

The main determinant of hesitation to take COVID-19 vaccine is the belief of the sample members in the inability of the vaccine to protect against infection, especially the results of taking the vaccine did not appear on the individuals who received the vaccine until now. This result was agreed with the research (Mohamad et al., 2021) in Syria which state that one of the reasons for refusal and hesitancy to accept COVID-19 vaccination was doubts about vaccine efficiency. Also, this result agreed with the researcher's (Sallam, Dababseh, Eid, Hasan, et al., 2021b) study in which it appears that the belief that the vaccine does not protect of negative side effects lead to hesitancy of taking COVID-19 vaccine.

It has been showed that the fears on most of its perspectives such as fear of vaccine's side effect, lack of sufficient information about the vaccine and fear of receiving certain types of vaccines rather than other play sufficient role of hesitancy of taking COVID-19 vaccine. This

result is in agreement with (Tran et al., 2021) in Russia which stated that the most frequent barrier of taking the vaccine where it's effectiveness, safety and side effect and the majority of participants reported that the availability of sufficient information about the vaccine is their main motivation to receive the vaccine. Also, it is in agreement with (Hatmal et al., 2021) conducted in Jordan in that most people preferred to get Pfizer-BioNtech rather than other type as it causes less or no symptoms at all. But, this result was disagreed with the results of researcher (Grey, I., Arora, T., Thomas, J., Saneh, A., Tohme, P., & Abi-habib et al., 2020) in Germany which most of sample respondents stated that they absolutely would accept the vaccination in which it appears that there no relationship between the fears and COVID-19 vaccine hesitancy.

It was found there is a statistically significant and negative effect of beliefs and fears on the hesitation of taking the Corona vaccine; meaning that beliefs and fears played a negative effect in accepting the Corona vaccine. This result was agreed with (Bendau et al., 2021) study in which it appears that there is effect of fears on COVID-19 vaccine hesitancy. and agrees with the study's (Cerda & García, 2021) which found that the fear of side effects, lack of information, the impact of social media, and distrust in the medical sector have a negative effect on taking the vaccine.

The study recommended the official authorities such as the Jordanian Ministry of Health to increase the awareness of individuals about the importance role of the Corona vaccine and convince them that the fears generated within them are unreal and that the Corona vaccine is the same as the other vaccines that have previously been vaccinated to members of the community. Also the study recommended community members not to rely on social media sources as a source for obtaining information related to COVID-19 vaccine, especially as it is tainted by many rumors and errors.

Finally, the study recommends that researchers and scholars expand the application of the study and search for other determinants that lead to hesitancy of taking the corona vaccine, including for example anxiety; smoking status and healthcare related jobs; trust in the local health system; occupation and annual Income. In addition to making comparisons between the determinants of hesitancy of taking the Corona vaccine in developing and developed countries, in order to reach effective solutions in this regard.

5. Limitations of the Study

This study is a limited cross sectional study that concentrates on determinates of hesitancy of taking Covid-19 vaccine among limited number of Jordanians living in Irbid town and cannot be thought to represent the residents of Jordan, since obtaining a national sample is beyond our scope and isn't feasible in terms of financial resources and duration of the study. Another limitation of our study was the limited number of variables that were studied as determinants of hesitation of taking the corona vaccine, as they focused on the demographic characteristics of the study sample in addition to beliefs and fears, and researchers are not able to cover all the determinants related to the hesitancy of taking the corona vaccine.

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