

## RESEARCH TITLE

# EXPLORATION AND ANALYSIS OF SOCIAL SATISFACTION AND SOCIETY AWARENESS REGARDING THE AVAILABILITY OF DRUGS AND VACCINES IN JORDAN CORRELATED WITH COVID-19

Dima AL-jakhim<sup>(a)</sup>, Nizar M.Mhaidat<sup>(b)</sup> Iman Bashedi<sup>(c)</sup>

<sup>(c)</sup> Faculty of pharmacy, Applied Science private University, Amman, Jordan.

<sup>(b)</sup> Jordan food and drug administration, Amman, Jordan.

Email: demaaljakhim.93@gmail.com

HNSJ, 2021, 2(12); <https://doi.org/10.53796/hnsj21211>

Published at 01/12/2021

Accepted at 08/11/2021

## Abstract

**Aim:** To assess social satisfaction and society awareness regarding the availability of drugs and vaccines in Jordan correlated with Corona virus Disease 2019 (COVID-19). Furthermore, to investigate the Jordanian citizens awareness on the importance of COVID-19 drugs and vaccines, their willingness to take these medicaments, and to predict whether if they believe that these drugs and vaccines are effective in minimizing the risk of corona virus.

**Methods:** A descriptive cross-sectional online survey was conducted between August, 02 to October 05, 2020 in Jordan Statistical Package for the Social Sciences (SPSS) software was utilized for analyzing the results obtained.

**Results:** A total of 214 participants were recruited into the study with a response rate of (%60.9). The majority of participants were females (65.4%), residents in Amman (72.3%) and bachelor's degree holders (66.7%). Large portion of citizens (> 70%) agreed that taking COVID-19 vaccines would prevent future diseases, and delaying vaccination increases the risk of contracting measles, meningitis, whooping cough and other diseases. Roughly 50% of the sample surveyed agreed that Corona pandemic increases parents' fear of continuing the national vaccination program, and that the Corona pandemic has affected the supply of vaccines to the country from abroad. Most of study sample (86.3%) agreed with the necessity to provide vaccines for a period of not less than three months as a strategic stock. Quarter of respondents (25%) were not satisfied that COVID-19 vaccines would be effective in reducing different severe impacts and consequences related to COVID-19, additional to the fact that they believe that buying large quantities would not contribute to drug safety.

**Conclusion:** It is highly recommended to build an adequate trust between Jordanian government and citizens for achieving effective social satisfaction regarding the importance of COVID-19 drugs and vaccines. In addition, it is recommended to strengthen several media instruments to attract people attention and promote their medical knowledge to clarify that COVID-19 drugs and vaccines are remarkably vital for reducing the risk of expected COVID-19 infections in the future.

**Key Words:** COVID-19 quarantine, social satisfaction, society awareness, COVID-19 drugs, COVID-19 vaccine, medicine availability, economic threat.

## Introduction

COVID-19 was initiated from Wuhan region, a province in China, then it was spread exponentially reaching most of global regions (Liu et al., 2020). Because of the high infection numbers and death rate at its initial time, COVID-19 was announced to be a worldwide pandemic (Cucinotta & Vanelli, 2020). For this reason, World Health Organization (WHO) issued several intensive instructions including social distancing, self-quarantining, distance learning, hand washing and other hygienic recommendations in order to halt the spreading of this virus as it was growing exponentially (Wismans et al., 2020). Up to this day, more than 94 million cases were confirmed, and more than 2 million deaths were reported due to the COVID-19 (WHO, 2021). The Corona virus pandemic had several impacts on the health care department, individuals' physical and mental health as well as individuals' socio-economic status. Due to the strict quarantine imposed by the WHO, in an aim to minimize the speed of Corona virus spread, several challenges emerged in maintaining treatment services for people, in both developed and developing countries. For developed countries, the impact of COVID-19 due to the complete lock down was a bigger threat, as it enormously affected the original economy status (Legese, 2020). In Jordan, the COVID-19 situation was highly harmful and critical, as the government doesn't have the capabilities to compensate and cover all massive financial losses occurred during the lock down which led many individuals to lose trust and feel hesitant regarding the government decisions. As well as medications production and supply chains were impaired by this crisis (Newton & Bond, 2020). Even before the COVID-19, 2 billion people lacked regular access to basic medicines (WHO, 2017). The maintenance of pharmaceutical products, medicines and supplies is crucial to maintain a smooth functioning of the healthcare delivery system. In addition, immunization programs around the world have been affected as a consequence of the COVID-19 crisis. With the continuous spread of the virus, loss of individuals trusts in the governments and science doubts, worries are growing about these immunization programs due to the growing phenomenon of vaccine hesitancy, especially in the anticipation of medications and the newly developed vaccines against COVID-19 (WHO, 2014). Hence, urgent policy decisions are needed to ensure access to safe and effective medical products alongside to vaccines on which the population will depend on.

Therefore, this cross-sectional study was designed to assess the Jordanian social satisfaction and society awareness regarding the availability of drugs and vaccines for COVID-19 pandemic. Furthermore, the aim of this work was to assess the Jordanian awareness and alertness on the importance of COVID-19 drugs and vaccines, their willingness to take these medicaments, and their beliefs on the effectiveness of these medications and vaccines in minimizing the risk of corona virus.

## Materials and methods

### Study design and participants

The study aim was addressed in a descriptive cross-sectional online survey. This study was conducted in Jordan during the Coronavirus outbreak (from August to October 2020). Eligible participants were doctors, pharmacists, academics, consumers, specialists of procurement and supply, purchase officers in the Jordanian Government procurement department (JPD) and pharmaceutical suppliers. Ethical approval for the study was obtained from the Faculty of Pharmacy, Applied Science Private University on ..... (Approval No: 2021-PHA-17.....). Potential participants who completed the survey have given informed consent prior study participation.

### Survey development

A cross-sectional survey was developed to assess different aspects regarding the COVID-19 pandemic. The survey included several questions regarding the (1) the awareness of COVID-19 among participants, (2) the availability of COVID-19 vaccines, (3) the perspective of participants regarding buying large quantities of vaccines on the feasibility of health security, and (4) their aspects on drug safety related to future infections. The questionnaire was prepared and distributed electronically, and answers were collected via common social media platforms, such as Facebook, WhatsApp, and Messenger.

## Survey implementation

Study participants were recruited through online mobile applications. Those, who were willing to consider participation, opened a link to initially view ethics committee approved information about the study and then proceeding to the survey.

## Sample size

A total of 350 participants was chosen randomly considering their demographic characteristics, such as gender, age, and job type. Only 213 participants have responded and were recruited to the study with a total response rate of 60.9%.

## Statistical analysis

Data was analyzed via Statistical package for Social Science (SPSS) version (21). Descriptive analysis was undertaken using mean and standard deviations for continuous variables. Qualitative variables were summarized using frequencies and percentages. The inferential statistics (Simple linear regression and Correlation analysis by Person coefficient) were utilized to compare differences. A p-value < 0.05 was used to test for statistical significance.

### Level of relative importance for the study tool's questions and dimensions

According to Five Likert-Scale, the level of relative importance for the study tool's questions and dimensions is determined via cut point formula as follows:

$$\begin{aligned} \text{Cut point} &= \text{Total Mean} \pm 1\text{SD} \dots\dots\dots(1) \\ &= 3.48 \pm 0.65; \\ &= (2.83, 4.13). \end{aligned}$$

The level of relative importance for the study tool's questions and dimensions are: (1) Low level of relative importance if the mean of responses less than 2.83, (2) Medium level of relative importance if the mean of responses ranges between 2.83 and 4.13, and (3) High level of relative importance if the mean of responses is more than 4.13.

## Results

Data was collected from (n=213) participant with a response rate 60.9%. Demographic characteristics of study participants are illustrated in table (1).

**Table (1): Demographic characteristics of study participants (n=213).**

Participants' characteristics	Total n(%)
<b>Gender</b>	
Male	85 (17.3)
Female	128 (65.4)
<b>Residence Place</b>	
Jordan-Amman	154 (72.3)
Jordan-outside of Amman	44 (20.7)
Outside of Jordan	15 (7.0)
<b>Educational Level</b>	
Diploma	21 (9.9)
Bachelor	142 (66.7)
Master	40 (18.8)
PhD	10 (4.7)
<b>Employment</b>	
Doctor	45 (21.1)
Pharmacist	95 (44.6)
Purchase officer in JPD	2 (0.9)
Specialist procurement and supply	1 (0.5)
Pharmaceutical supplier	5 (2.3)
Academic	20 (9.4)
Consumer	45 (21.1)

Table (1) shows that (65.4%) of the sample were females. Most of study sample (72.3%) lived in Amman, Jordan. The majority of individuals in the sample (66.7%) had a bachelor's degree and (18.8%) had a master's degree. Approximately, half of participants (44.6%) were pharmacists and (22.2%) were doctors.

In assessment of the participants expected outlook and the impact of COVID-19 on the availability of medicines and vaccines in Jordan, the responses are illustrated in table (2).

**Table (2): Participants responses on the impact of COVID-19 on the availability of medicines and vaccines in Jordan.**

No.	Study tool questions	Responses				
		Totally Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Totally Agree (%)
1	Do you trust that the vaccination will prevent future diseases?	3.3	9.4	15.5	50.2	21.6
2	Has the vaccination rate decreased due to the spread of the Corona pandemic?	2.8	23.0	32.9	32.4	8.9
3	Do you think that delaying vaccination increases the risk of contracting measles, meningitis, whooping cough and other diseases that can be prevented with vaccines?	2.8	10.8	10.8	48.8	26.8
4	Does the Corona pandemic increase parents' fear of continuing the national vaccination program?	4.7	20.2	25.4	39.0	10.8
5	Has the Corona pandemic affected the supply of vaccines to the country from abroad?	1.4	10.3	32.9	39.4	16.0
6	Do you agree with the necessity to provide vaccines for a period of not less than three months as a strategic stock?	1.4	2.3	9.9	46.9	39.4
7	Do you agree with the two-year purchase policy for vaccines approved in the National Immunization Program?	3.8	12.2	22.5	35.7	25.8
8	Has the spread of Corona pandemic affected the availability of vaccines in the medical sector?	2.8	16.9	35.2	34.7	10.3
9	Does buying large quantities contribute to achieving drug safety?	1.9	15.5	31.0	35.7	16.0
10	Are you with the implementation of the purchase policy for more than a year to achieve drug security?	3.3	18.8	26.8	31.5	19.7

The results indicate that the majority of the study sample (71.8%) agreed/totally agreed that the vaccination will prevent future diseases. In addition, it was found that less than half of the participants (41.3%) agreed/totally agreed that the vaccination rate has decreased due to the spread of the Corona pandemic. Moreover, it was found that most of study sample (75.6%) agreed/totally agreed on believing that delaying vaccination increases the risk of contracting measles, meningitis, whooping cough and other diseases that can be prevented with vaccines.

As for parents' concern and fear regarding continuing the national vaccination program approximately half of the participants (49.8%) agreed/totally agreed that the Corona pandemic will increase the parents fear. As well as more than half of the participants (55.4%) agreed/totally agreed that the Corona pandemic has affected the supply of vaccines to the country from abroad.

Most of study sample (86.3%) agreed/totally agreed on the necessity of providing vaccines for a period of not less than three months as a strategic stock. The majority of study sample (61.5%) agreed /totally agreed with the two-year purchase policy for vaccines approved in the National Immunization Program, while (16.0%) of them disagreed. To add on, more (45.0%) agreed/totally agreed that the spread of Corona pandemic has affected the availability of vaccines in the medical sector. More than half of the participants (51.7%) agreed/totally agreed that buying large quantities contributes to achieving drug safety. And in order to achieve drug security approximately half of the participants (51.2%) agreed/ totally agreed with the implementation of the purchase policy for more than a year.

Table (3) illustrates means, standard deviations and the level of importance for the study tool's dimensions according to the study participant's responses.

**Table (3): Means, Standard deviations and the level of importance for the study tool's questions and dimensions according to study sample responses.**

No	Question and dimensions	Mean	SD	The level of relative importance
1	Has the vaccination rate decreased due to the spread of the Corona pandemic?	3.01	1.28	medium
2	Does the Corona pandemic increase parents' fear of continuing the national vaccination program?	3.15	1.29	medium
<b>The availability of vaccines</b>		<b>3.08</b>	<b>1.03</b>	<b>medium</b>
3	Has the Corona pandemic affected the supply of vaccines to the country from abroad?	3.49	1.11	medium
4	Has the spread of Corona pandemic affected the availability of vaccines in the medical sector?	3.19	1.20	medium
<b>Corona-19 Pandemic</b>		<b>3.34</b>	<b>0.99</b>	<b>medium</b>
5	Do you agree with the necessity to provide vaccines for a period of not less than three months as a strategic stock?	4.20	0.85	High
6	Do you agree with the two-year purchase policy for vaccines approved in the National Immunization Program?	3.59	1.25	medium
<b>Buying large quantities of vaccines</b>		<b>3.89</b>	<b>0.88</b>	<b>medium</b>
7	Does buying large quantities contribute to achieving drug safety?	3.35	1.23	medium
8	Are you with the implementation of the purchase policy for more than a year to achieve drug security?	3.30	1.34	medium
<b>Achieving drug safety</b>		<b>3.32</b>	<b>1.17</b>	<b>medium</b>
9	Do you trust that the vaccination will prevent future diseases?	3.71	1.13	medium
10	Do you think that delaying vaccination increases the risk of contracting measles, meningitis, whooping cough and other diseases that can be prevented with vaccines?	3.78	1.19	medium
<b>Future infection</b>		<b>3.75</b>	<b>0.91</b>	<b>medium</b>
<b>Total</b>		<b>3.48</b>	<b>0.65</b>	<b>medium</b>



From table (3), the total mean of study sample responses related to study tool's questions was perceived to be present with a mean of 3.48 (SD=0.65) at a medium level according to the Five Likert- Scale. Furthermore, it can be inferred that responses mean of study tool's questions ranges between (3.01) and (4.20) according to Five Likert- Scale. The highest responses mean was for the question "Do you agree with the necessity to provide vaccines for a period of not less than three months as a strategic stock?" with a value of 4.20 (SD=0.85) at a high level, but the lowest mean was for the question "Has the vaccination rate decreased due to the spread of the Corona pandemic?" with a value of 3.01 (SD=1.28) at a medium level. In addition, it can be inferred that responses mean of study dimensions ranges between (3.08) and (3.89) according to Five Likert- Scale. The highest responses mean was for the dimension "Buying large quantities of vaccines" with a value of 3.89 (SD = 0.88) at a medium level, but the lowest mean was for the dimension "The availability of vaccines" with a value of 3.08 (SD = 1.03) at a medium level. **First Research Question:**

Is there a significant effect of COVID-19 pandemic on the availability of vaccines?

We can answer this research question by using simple linear regression analysis at a significance level of (0.05).

The results of simple linear regression analysis were as the following:

**Table 4: Results of simple linear regression analysis**

Dependent Variable	Independent Variable	$\beta$	t-test	Model Statistics
Availability of vaccines	COVID-19 pandemic	0.424	6.559	$R^2 = 0.169$ ; F-test=43.020; $P < 0.001$

The results in the table above showed that there was an influential relationship and a significant effect of the independent variable (COVID-19 pandemic) as a predictor on the dependent variable (Availability of vaccines) according to the simple linear regression indicators ( $R^2=0.169$ , F-test=43.020,  $B=0.424$ ,  $P < 0.001$ ). The simple linear regression model by its predictor explained (16.9%) of total availability of vaccines variation.

Therefore, we can conclude that there is a significant effect of COVID-19 pandemic on the availability of vaccines at a significance level of (0.05) according to study sample responses.

#### 4.5.2 Second Research Question:

Is there any correlation or association when buying large quantities of vaccines to achieving drug safety?

We can answer this research question by using correlation analysis at a significance level of (0.05).

The results of correlation analysis were as the following:

**Table 5: Results of correlation analysis**

Variables	Pearson coefficient	Sample size	Sig.
Buying large quantities of vaccines	0.695**	213	0.000
Achieving drug safety			

The results in the table above showed that there was a significant relationship between (Buying large quantities of vaccines) and (Achieving drug safety) at significance level of (0.05). The value of Pearson linear correlation coefficient equaled (0.695) and it was significant ( $P < 0.001$ ). The relationship was somewhat strong and had a positive direction.

Therefore, we can conclude that there is a significant correlation or association when buying large quantities of vaccines to achieving drug safety at a significance level of (0.05) according to study sample responses.

### Third Research Question:

Is there an association that availability of vaccines will protect against future infection?

We can answer this research question by using correlation analysis at a significance level of (0.05). The results of correlation analysis were as the following:

**Table 6: Results of correlation analysis**

Variables	Pearson coefficient	Sample size	Sig.
Availability of vaccines	0.092	213	0.181
Future infection			

The results in the table above showed that there was no significant relationship between (Availability of vaccines) and (Future infection) at significance level of (0.05). The value of Pearson linear correlation coefficient equaled (0.092) and it was not significant ( $P > 0.05$ ).

Therefore, we can conclude that there is no significant association that availability of vaccines will protect against future infection at a significance level of (0.05) according to study sample responses.

### Discussion

The findings of this work indicate that Jordanian citizens trust the principles of vaccinations, and they have higher amount of awareness, as they believed that COVID-19 vaccines and drugs can be highly effective in reducing the amount of infection and disease prevalence. This result is consistent with (Bonyan et al., 2020), who conduct a study to investigate and evaluate the factors, which affected the responses and level of awareness related to COVID-19 in several Arabian nations. Bonyan et al. found that there was relatively high level of knowledge, and an acceptable level of awareness regarding COVID-19 among several Arabic nations, including Jordan, Palestine, Qatar, United Arab Emirates, the Kingdom of Saudi Arabia, and Egypt. Furthermore, Bonyan et al. results indicated that there was a higher level of awareness associated with individuals who were older, having a higher degree of education, and those who worked in healthcare organizations. In addition, these study findings are similar to Al-Henawi et al. study findings (Al-Hanawi et al., 2020), which was conducted to determine and measure the level of awareness, and attitudes of the Saudi Arabian population regarding the regulations and instructions defined and issued by Saudi government. Al-Hanawi et al. found that most of the individuals surveyed were aware regarding COVID-19 regulations, and practices. Moreover, they found that average score of positive attitudes was 28.23. Also, these results are consistent with the findings of (El-Elimat et al., 2020), who investigated the level of individuals awareness regarding the COVID-19. The study found that older individuals had relatively more positive attitude and effective healthcare practices more than young individuals in Jordan. Also, the results of this study are similar to the results of Paul et al. (Paul et al., 2020), who conduct a cross-sectional study to measure the level of awareness among citizens in the UK. The most of the UK citizens were aware of COVID-19 preventative measurements; however, 16% of the sample population (16% of 32,361 individuals) showed higher level of mistrust and misinformation regarding the COVID-19 vaccines. Additionally, 14% of the sample indicated that they are not willing to take

COVID-19 vaccines. It was observed that this higher level of mistrust and unawareness goes back to the lower levels of education, knowledge and salaries in the UK, which led to higher levels of uncertainty related to COVID-19. On the other hand, the findings of (Sallam, 2021), measuring the level of COVID-19 vaccines awareness among international society, reported that regions in the Middle East and Central Asia, South and Middle America, Eastern Europe, and Africa displayed high level of hesitancy and untrust to take COVID-19 vaccines. For this reason, he recommended utilizing intensive media campaigns to increase the level of knowledge and awareness. In addition, the results of this study indicated that not all Jordanians (only 51.7% agree and 31% are not sure) agreed on the concept of buying large quantities of COVID-19 vaccines would achieve a national drug security.

Wong and his colleagues (Wong et al., 2021), who conducted a study to investigate the level of awareness among individuals in Hong Kong via telephone calls survey, found that one of the major obstacles facing the acceptance of COVID-19 vaccines is its availability. Acceptance is not achieved through drug security or higher quantity of COVID-19 only. Instead, governments should focus on increasing the level of awareness and confidence, as citizens do not trust new vaccines platforms, or new manufacturers, who can provide mass quantity of COVID-19 vaccines. Moreover, the key role of government is highly critical and effective in providing COVID-19 vaccines acceptance among citizens, and it is considered as the driver for improving COVID-19 vaccination strategies awareness instead of producing large quantities of COVID-19 vaccines and drugs with no society acceptance. It was reported that (43.4%) of Hong Kong's study sample showed no confidence to vaccines platforms, whereas (52.2%) showed untrust to new companies and manufacturers of COVID-19 vaccines (Wong et al., 2021). In contrary to this, German and Russian government are reported to producing and storing massive quantities of COVID-19 vaccines in order to offer future drug safety and security to many regions in the world (Gruenwald, 2020).

## Conclusion

To conclude, this work illustrates major consequences and impacts related to COVID-19 pandemic. One of these major consequences was the COVID-19 quarantine, a global strict outbreak imposed by WHO for reducing the spread of Corona virus affecting the status of global economy, and causing a threat for developing countries, particularly, in Jordan. This threat led many individuals to feel hesitant to take COVID-19 vaccines and caused a significant loss of trust in the governments. Through this work, the amount of social satisfaction and society awareness regarding the availability of drugs and vaccines in Jordan, and vaccine consideration was studied. No adequate trust and confidence were found that would allow Jordanian citizens to be enthusiastic for taking COVID-19 vaccines. For this reason, recommendations were proposed to resolve these issues.

## Recommendations

Based on the results obtained from the cross-sectional study in this work, it is highly recommended to implement a few recommendations to promote the quality and level of health outputs in Jordan, via:

- 1- Activating the role of Jordanian Ministry of Health (JMh) through social media and workshops to help citizens receive the vital instructions of medical staff.
- 2- Enhancing confidence level and trust between Jordanian government and citizens by conducting meetings, events, and lectures, making them more involved and close to monitor pandemic updates.
- 3- Increasing the awareness of the Jordanian society regarding the effective role of COVID-19 drugs and vaccines by illustrating their effectiveness and possible side effects.
- 4- Distributing several brochures and manuals in different healthcare facilities to boost citizen's confidence with COVID-19 drugs and vaccines their vital role in reducing future complications for society.

## Conflict of Interest

Authors disclose that there was no conflict of interest related to this work.



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