

Health Consequences of University Employees Post Covid-19 Vaccination at Palestinian Universities

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Abstract

The control of vaccine hesitancy comes with key protective measures against COVID-19 and excellent efficacy in clinical trials and effectiveness in real-world data. However, some people believe that vaccination is ineffective and that it causes health problems. We aimed to assess health consequences of university employees post Covid-19 vaccination at Palestinian Universities. The researchers conducted a descriptive study design between February and March 2021. A total of 310 university employees participated from six universities in Palestine: Nablus University for Vocational & Technical Education, An-Najah National University, Modern University College, Birzeit University, Hebron University, Arab American University, and Al-Quds Open University. These universities were selected to be included in the study. A self-designed questionnaire was used for data collection and included the following parts: part I: personal characteristics of the university employees, Part II. Knowledge of university employees about covid-19 vaccination, Part III: Medical background of the participant, also their perception regarding receiving the COVID-19 vaccination. We found that less than the half of studied employees (41.3 %) were between 30<40 years with \pm SD 38.6 \pm 7, more than three quarters, 79.4 %, were males; 41.9% of them recorded class II obesity, 72.6% suffered from chronic problems while 22.6% of them stayed in hospital post covid vaccination. based on the current study, there was a positive correlation between the total of university employees' health consequence, perception, and their knowledge. Also, there was a highly statistical significant difference between the total perception and their knowledge.

Recommendation: the study recommends publicity to enlighten people about what Covid-19 vaccination is, in order to correct the negative perception around the vaccine.

Introduction

Vaccination against covid-19 is a leading strategy to change the course of the COVID-19 pandemic worldwide. Covid-19 vaccines show excellent efficacy in clinical trials, and effectiveness in real-world data; however, some people still become infected with SARS-CoV-2 after vaccination. Vaccination is recognized as the most successful and cost-effective public health intervention in today's world and it has made a very large contribution to improving global health by reducing the incidence and deaths of many infectious diseases (1). China and the whole world are experiencing the third wave of epidemics. Therefore, it is very important to establish herd immunity by vaccinating against COVID-19 (2).

The WHO identified vaccine hesitancy as a leading threat to global health. Vaccine hesitancy could be due to inconvenience in accessing vaccines, complacency, or lack of trust (3). In addition, different immeasurable influences could make the issue more complex depending on context, time, place, and type of vaccine.

There were differences in the acceptance rate of COVID-19 vaccine in different countries—less than 55% in Russia to 90% in China (4) in the KSA, in December 2020, 50.5% of health workers (5) and 48% of the general population (6) expressed their intent to receive the COVID-19 vaccine.

Health consequences after vaccination are less common in a real-world community setting than reported, mostly minor in severity, and self-limiting. Our data will enable prediction of side-effects based on age, sex, and past COVID-19 status to help update guidance to health professionals to reassure the population about the safety of vaccines (4).

Multi-organ effects post covid-19 vaccination which is known as health consequences; some people who had severe illness experienced many of these effects if not all body systems or autoimmune conditions over a long time with symptoms including heart, lung, kidney, skin and brain functions. Autoimmune condition occurs when the immune system is attacked causing inflammation as swelling or tissue damage. Severe illness of lung or other organ can cause health effects like severe weakness, and exhaustion which need a hospitalization control health status in an intensive care unit. These effects can include a severe weakness, problems with thinking and post-traumatic stress disorder (7).

Aim of the Study

This study aimed to assess the health consequence of University Employees Post Covid-19 Vaccination at Palestinian Universities through:

1. Assess the health consequences post Covid-19 vaccination among university employees.
2. Assess duration, severity, and admission to hospital.
3. Assess employees' knowledge regarding covid vaccination and
4. Their perception regarding receiving the covid-19.

Research Question:

What are the health consequences of university employees post receiving Covid-19 vaccination?

Methods

Research Design: Descriptive study design:

Setting and Study Population:

The study was conducted at six universities in Palestine: Nablus University for Vocational & Technical Education, An-Najah National University, Modern University College, Birzeit University, Hebron University, Arab American University, and Al-Quds Open University. They were selected to be included in the study.

Sample Size : A convenient sample included 310 employees who work at the previous mentioned setting: 30 employees work at Nablus University for Vocational & Technical Education, 50 employees from An-Najah National University, 90 employees from Modern University College, 30 employees from Birzeit University, 30 employees from Hebron University, 40 employees from Arab American University, and 40 employees work at Al-Quds Open University.

Subjects:

The target population of this study are university employees who work at the previously mentioned settings. The study was conducted for two months in September & October 2021.

Tools of data collection: One tool is used to collect the necessary data. It was developed by the researcher after reviewing recent literature to collect necessary data as reported by university employees.

A self-designed questionnaire was addressed including the followings:

- (1) Demographic characteristics of university employees as age, gender, educational level, place of residence, and monthly family income.
- (2) Concerns to body mass index to analyze the associations between BMI and health consequences post covid vaccination. Scoring according the BMI, was classified into: a BMI from 25-29.9 kg/m² were overweight, BMI from 30- 34.9 kg/m² class1 obesity, BMI from 35-39.9 kg/m² class 11obesity and BMI >40kg/m² were Obese class III.
- (3) Medical background included receiving annual flu vaccination before Covid-19 vaccine, chronic medical problems, history of COVID-19 infection, family history of covid, smoking, exposure to any environmental pollutants, and classification of symptoms after vaccination post the first & second dose.
- (4) Is concerned health consequences assessment Questionnaire of university employee post Covid-19 vaccination? Measuring the score of employees reported health consequences were calculated as follows, which was answered by yes if health consequences present and no if not present. As the highest score is two, then the total scale scored 16 points. The final score of patients' responses was 60% and above, representing a good health but less than 60% denoting a poor health.
- (5) Concerns about university employees' knowledge about covid-19 vaccination; the questionnaire covered the following items: action of vaccine, aim, types of covid-19 vaccine, symptoms, duration, post-vaccine signs, safety of vaccine regarding pregnancy& lactating women, and effect on fertility. The scoring system for this part was as follows: two grades were given for each correct answer and zero grades for the incorrect

answer, with total grades = 80 grades. The total score for knowledge is classified as: Good knowledge $\geq 60\%$ = 49-80 points, average knowledge 50-60% = 40–48 points and Poor knowledge $\leq 50\%$ = 0–39 points.

(6) Measurement of the participants' perception regarding receiving the COVID-19 vaccination. This part was developed by the researcher. The Cronbach α coefficients indicating internal consistency (i.e., reliability) 78 for the total perception, was assessed using two-point Likert scales (agree, disagree). We compared the vaccine acceptance and hesitancy in accordance with the employees. The total score for perception is classified as positive or negative perception.

Validity: The researcher designed an opinionnaire sheet to test the content validity of the assessment questionnaire sheet assessed by a jury of 3 experts in the field of Community Health Nursing and Medical professor staff. The reliability was tested using the Cronbach's Alpha Coefficient test which revealed that each one of the tools consisted of relatively homogenous items as indicated by the moderate to high reliability of the tool.

Ethical Approval was obtained from the Institutional Review Board of Nabulus University for Vocational & Technical Education, An-Najah National University, Modern University College, Birzeit University, Hebron University, Arab American University, and Al-Quds Open University, which approved this study. All universities included in the study were invited to participate voluntarily after explaining the study aim. They were also informed that participating in this study was completely voluntary and was not associated with any benefits or harms.

Pilot study: A plot study was carried out on 10% (31) employees from the total number of sample to assess the tools' clarity, objectivity and feasibility, and to estimate the time needed for data collection. Those employees in the plot study were included in the main study sample since some modifications were made.

Statistical Analysis

The data collected were revised, coded, tabulated, and statistically analyzed and performed using SPSS for windows version 20.0 (SPSS, Chicago, IL). All continuous data were normally distributed, and expressed in mean \pm standard deviation (SD). Categorical data were expressed in numbers and percentages. The student's t-test was used for comparison between two variables with continuous data. The Chi-square test was used for the comparison of variables with categorical data. Statistical significance was set at a high statistically significant difference ($p < 0.001$). Person correlation coefficient (r) was used for correlation analysis.

Results

Table (1): shows that, less than the half of studied employees (41.3 %) were between 30<40 years with \pm SD 38.6 \pm 7, more than three quarters 79.4 % were males, and 35.5% of them had post graduate education. More than half (54.8 %) of studied employees were living in the city, while 37.1% were living in village. Also, 43% of studied employees monthly income was not enough.

Table (2): clarifies that the majority (86.5%) of studied employees were recorded normal weight, 9.6% of them were recorded overweight, while the rest of them (3.9%) were recorded underweight.

Table (3): demonstrated that more than two thirds of studied employees (67.4%) didn't receive the seasonal influenza vaccine before covid-19. Nearly to three quarters of them (72.6%) were sufferings from chronic diseases such as diabetes, blood pressure, asthma and kidney diseases. Moreover, 64.5% of them were not diagnosed with covid-19 before taking the vaccine. In addition, 57.4% of the employees had contacted covid-19 family cases. Furthermore, 72.3% & 47.8% of studied employees smoke cigarette and are exposed to environmental pollutions respectively such as vehicle exhaust pollutants.

Table (4): shows that less than the half of studied employees (43.2%) had fever post the 2nd dose of covid-19 vaccination, the temperature of 48.4% of the employees ranged between 38.5c to 40c. regarding the site of injection, 35.5% & 30.3% of them had a feeling of pain and itching after the 1st dose injection, and 31.3% & 18.1% had a feeling of pain and swelling post the 2nd dose respectively. In addition, 44.5% & 46.1% of them complained of chills and pain in muscles post the 1st dose. Also, 58.1% of them had exhaustion compared to 49% of them post the 2nd dose. 39.4% & 39.7% had headache, emesis, & abdominal pain post the 1st dose and the same line at the 2nd dose. Furthermore, 67.4% of them received the health care through e-mail in the 1st dose compared to 36.1% of them in the 2nd dose. In addition, the rest of them (2.3%) received care from hospital post the 1st dose while 14.5% of employees received it post the 2nd dose of vaccination.

Figure (1) :shows that, 29.2% & 38.9% of studied employees had respiratory problems post the 1st & 2nd dose of covid-19 vaccination respectively. 9.7% & 11.6% of them had high blood pressure, and diabetic problems post the 1st dose respectively. 16.7 % & 19% of the studied employees had digestive problems post the 1st & 2nd dose. In addition, 10.2% of them had cardiovascular problems post the 2nd dose. Furthermore, 3.2% of them had liver problems, while 11.1% of the studied employees had kidney problems post the 2nd dose of vaccine. Lastly, 2.3% of them had thyroid problems post the 2nd dose of vaccination.

Figure (2): illustrates that 55.5% of the studied university employees had poor health; while 44.5 % of them had good health post covid-19 vaccination.

Figure (3): shows that more than half of studied employees' (28.6%) stay period in hospital was less than a week, 14.3% stayed in hospital for more than 2 weeks. While, 57.1% of them stayed in hospital from 1 to 2 weeks.

Table (5): illustrates that 61% & 62.6% of the studied employees had poor knowledge about the action of covid-19 vaccines, and safety of vaccine respectively. Also, 58%, 54.2 & 56.8% had poor knowledge about aim, types of covid-19 vaccinations, symptoms, and exposure post vaccination respectively. In addition, nearly more than three quarters (75.8%) had poor knowledge about safety of vaccine regarding lactating mother. On the other hand, 31.6% of employees had average knowledge about the types of covid-19 vaccination.

Figure (4): illustrates that 58% of the studied university employees had poor knowledge; 25.5 % of them had average knowledge, while 16.5 % only had good knowledge regarding total score of knowledge.

Table (6): clarifies that 66.8% of studied university employees agreed that the chance of getting covid-19 in the future is very high, 55.5% of them disagreed that getting covid -19 is a strong possibility. Also, 66.5% of the studied sample disagreed that vaccination will decrease the chances of getting covid -19. In addition, 87.1% of employees agreed that complications of covid-19 are very serious. 73.2% of them agreed on feeling very sick after catching covid-19, and 62.9% of them disagreed about the efficacy availability of the vaccine. Furthermore, 64.5% of them agreed about the availability of side effects of the vaccination, 53.2% of the employees disagreed on receiving vaccine after obtaining complete information. 67.4% of them agreed on receiving vaccination after a large number of people take it. Finally, a great majority of employees assured that they received vaccination due to it being a requirement of work.

Figure (5): illustrates that 76.1% of the studied university employees had a negative perception towards covid-19 vaccination. On the other hand, 23.9 % of them had a positive perception towards covid-19 vaccination.

Table (7): reveals that there was a positive correlation between the total of university employees' health consequence, perception, and their knowledge. With reference to BMI, there was a highly significant difference between BMI and health consequences. Also, there was a highly statistical significant difference between the total perception and their knowledge.

Table (1): Distribution of the studied university employees according to the personal data (n=310)

Items	No	%
Age (years)		
< 20	26	8.4
20 < 30	55	17.7
30 < 40	128	41.3
>40	101	32.6
$\pm SD = 36.6 \pm 7$		
Gender		
Male	246	79.4
Female	64	20.6
Education level		
Basic Education	29	9.4
University Education	89	28.7
Post-Graduate Education	110	35.5
Other Mentioned	82	26.4
Place of residence:		
City	170	54.8
Village	115	37.1
Camp	25	8.1
Monthly family income:		
Sufficient	129	41.6
Not enough	133	43.0
Enough and safe	48	15.4

Table (2): Distribution of the studied university employees according to their total body mass index (BMI) (n=310)

Body Mass Index	No	%
Measurement of Body Mass Index		
<18.5 percentile (underweight)	12	3.9
18.5- 25 percentile (normal)	268	86.5
25- 30 percentile (overweight)	30	9.6
30- 35 percentile (obese)	0	0.0

Table (3): Distribution of the studied university employees according to their family history (n=310)

Items	No	%
Receive annual flu vaccination before Covid-19 vaccine		
Yes	101	32.6
No	209	67.4
Suffer from any chronic medical problems		
Yes	85	27.4
No	225	72.6
Chronic problems (n=85)		
Diabetes	25	29.4
blood pressure	12	14.1
Cardiovascular disease	11	12.9
thyroid gland	1	1.2
Allergy to certain medicines	2	2.4
Asthma and lung diseases	12	14.1
Kidney disease	13	15.3
liver disease	5	5.9
Arthritis	4	4.7
Diagnosed with Covid-19 before taking the vaccine		
Yes	110	35.5
No	200	64.5
Has anyone in the family contacted Covid-19 family cases		
Yes	178	57.4
No	132	42.6
Smoke cigarettes		
Yes	224	72.3
No	86	27.7
Exposed to any environmental pollutants		
Yes	148	47.8
No	162	52.2
Mention these pollutants (n=148)		
Straw/wood/coal smoke	13	8.8
Smoke factories	23	15.5
Vehicle exhaust	57	38.5
Others	55	37.2

Table(4): Distribution of the studied university employees exposure symptoms post first and second doses of vaccination (n= 310)

Items	1 st dose		2 nd dose	
	NO	%	NO	%
Had a fever				
Yes	101	32.6	134	43.2
No	209	67.4	176	56.8
Degree of temperature				
37.5: 38.3 C	125	40.3	119	38.5
38.5:40 C-	150	48.4	106	34.1
>40 C	35	11.3	85	27.4
Symptoms at (the injection site)				
Pain	110	35.5	97	31.3
Redness	35	11.3	27	8.7
Swelling	45	14.5	56	18.1
Itching	94	30.3	50	16.1
Nothing	39	12.6	67	21.6
Exposure to physical symptoms				
Chills	138	44.5	116	37.4
Headache	122	39.4	100	32.3
Joint pain	112	36.1	97	31.3
Pain in the muscles or the body	143	46.1	121	39.0
Exhaustion or fatigue	180	58.1	152	49.0
Emesis (nausea)	123	39.7	114	36.8
Vomiting	74	23.9	70	22.6
Diarrhea	60	19.4	53	17.1
Abdominal pain	122	39.4	110	35.5
Rash on different parts of the body	35	11.3	27	8.7
None	135	43.5	113	36.5
Others remember	17	5.5	13	4.2
Received health care through				
Health advice via e-mail	209	67.4	112	36.1
Visiting an outpatient	41	13.2	63	20.3
Doctor visits and home care	38	12.3	58	18.7
Visit the emergency department	15	4.8	32	10.4
Hospitalization	7	2.3	45	14.5

The number not mutely exclusive

Table (5): Knowledge of university employees in Palestinian universities regarding the Covid-19 vaccine

Items	Good		Average		Poor	
	N.	%	N.	%	N.	%
Action of Covid 19 Vaccine	451	4.5	76	24.5	183	51.0
Aim of Covid 19 vaccination	511	6.5	79	25.5	183	58.0
Type of Covid 19 Vaccination	441	4.2	98	31.6	168	54.2
Symptoms exposure post vaccination	521	6.7	82	26.5	176	56.8
Safety of vaccine as regard pregnancy	381	2.2	78	25.2	194	62.6
Safety of vaccine as regard Lactating mother	309	7.7	45	14.5	235	75.8
Effect of vaccine on fertility	411	3.2	69	22.3	206	64.5

Table (6): distribution of the perception of university employees receiving the COVID-19 (n=310)

Items	Agree		Disagree	
	No	%	No	%
Chance of getting COVID-19 in the future is very high	207	66.8	103	33.2
Currently, getting COVID-19 is a strong possibility	138	44.5	172	55.5
Vaccination will decrease my chances of getting COVID-19	104	33.5	206	66.5
Complications of COVID-19 is very serious	270	87.1	40	12.9
Feel very sick after getting COVID-19	227	73.2	83	26.8
The efficacy of the vaccination available	115	37.1	195	62.9
Side effects of the vaccination available	200	64.5	110	35.5
Received vaccine after receiving complete information	145	46.8	165	53.2
Received vaccination after a large number of people take it	209	67.4	101	32.6
Received vaccination because of the requirement of work	298	96.1	12	3.9

Table (7): Correlation between total knowledge of university employees and their health consequence and perception

Items		Total score knowledge	Total score of perception	Total score of health sequence
Total body mass index (BMI)	χ^2			16.348
	p-value			0.000
Total score of health consequence	r. test	.482**	.461**	
	p-value	0.000	0.000	
Total score of perception	χ^2	17.131		
	p-value	0.000		

*r-Pearson Correlation Coefficient **p-value <0.01*

Discussion

Vaccination has significantly decreased the burden of infectious diseases. Its role in disease control, elimination, or eradication has been recognized, and its benefits extend beyond the prevention of particular diseases in individuals. A high degree of vaccination coverage is needed to meet the global vaccine requirements (16).

Regarding the characteristics of the studied university employees, the results of the current study showed that, less than half of employees' ages ranged between 30 <40 years; with the mean age being 36.6 ± 7 years. This result was in accordance with the results of (9) in the study of "Effect of 2 inactivated SARS-CoV-2 vaccines on symptomatic COVID-19 infection in adults", who reported that mean age of participants' age more than half of participants aged between 30 <49 with mean 36.9 ± 8 years old.

Regarding the studied employees' gender, the results of study clear that, more than three quarters were males. This result agrees with (19) in the study about "COVID-19 vaccine hesitancy among health care workers" in Palestine, and found that less than two thirds were females. In addition, study carried by (5), about "Acceptability of a COVID-19 vaccine among healthcare workers" in Saudi Arabia, that found females were more hesitant having more health problems than males; this may be due to the differences in risk perceptions between two genders, as men are more likely to take risks than women.

According to level of education of studied employees, the results of the study showed that few of university employees had basic education, while nearly to one third of them had post graduate education. These findings are supported by (12), the study which entitled "Intention to participate in a COVID-19 vaccine

clinical trial and to get vaccinated against COVID-19" in France, which mentioned that, few of subjects were basic education, while more than one third of them were highly educated.

Regarding income, the current study clarified that less than half of studied employees had a not enough and sufficient income per month. The study findings were in an accordance with the results of **(28)**, the study which entitled " Safety and efficacy of the ChAdOx1 nCoV-19 vaccine (AZD1222) against SARS-CoV-2: an interim analysis of four randomized controlled trials" in Brazil, South Africa, and the UK, and reported that more than half of participants had 5000/LE or more per month. This result might be related to different incomes of individuals in the study areas.

Coming to the assessment of the studied university employees according to their body mass index , the results of the current study illustrates that less than half of studied employees were recorded class II overweight, one third of them were recorded class III. While, the rest of them were recorded class III overweight. This result disagrees with **(18)**, who carried out a study entitled "Vaccine side-effects and SARS-CoV-2 infection after vaccination in users of the COVID symptom study app" in the United Kingdom, who stated that reduction of infection was lower in individuals with a BMI of 30 kg/m² than in those with a BMI of less than 30 kg/m². From the researcher's point of view, the greater body weight — (missing verb) more than appropriate limit whenever the health was affected.

Regarding the family history of studied employees, the results of current study showed that more than two thirds of studied employees did not receive the seasonal influenza vaccine before covid-19. From the investigator's point of view, the use of influenza vaccine yearly is considered a decline to the chance of covid-19 hospitalization and severity of disease. The result of the current study agreed with **(20)** in a study about "Influenza vaccine uptake among Palestinian Hospitals' health care workers: barriers and motivators" who stated that, only one third of studied health workers received the flu vaccine at least once in the past five years. The investigator believes that there are two explanations for employees not being vaccinated: a healthy person does not need vaccines, and the vaccine is ineffective against influenza. Also, the result of the study was congruent with **(24)** who has a study entitled "Single dose vaccination in healthcare workers previously infected with SARS-CoV-2." found that more than two thirds of subjects received influenza vaccine yearly.

Regarding chronic health problems of studied university employees, the present study showed that nearly three quarters of them suffered from chronic health problems such as diabetes, blood pressure, asthma and kidney diseases. The previous findings are congruent with **(10)** in study entitled "COVID-19 vaccine confidence and hesitancy among healthcare workers: across-sectional survey from a MERS-CoV experienced nation" reported that less than a quarter of the studied sample had chronic disease. From the investigator's point of view, this finding could be due to the difference of health care from country to another.

Studying the exposure symptoms, this paper revealed that less than half of the studied employees had fever post the 2nd dose of covid-19 vaccination, and their temperature ranged between 38.5c to 40c. 35.5% & nearly one third of the studied employees experienced a feeling of pain and itching after the 1st dose injection. Furthermore, less than half of the studied sample had a feeling of chills and pains in their muscles post the 1st dose. Also, the results clear the gastrointestinal system was affected. This finding agrees with (21) whose conducted study entitled "Safety and efficacy of the BNT162b2 mRNA Covid-19 vaccine" in Italy, found that symptoms, including fever, headache and fatigue were the most common ones complained after the first dose, in addition to an injection-site pain. However, less than one third of users complained of injection site pain and less than a quarter of them suffered from fatigue and headache after the first dose. Symptoms were significantly more prevalent in women than in men. On the other hand, a study was carried by (30), in China and stated that systemic symptoms in injection site reaction appear within 7 days after each injection. The most common adverse reaction was pain at the injection site, which differed in severity and relieved without need for special treatment. Furthermore, during 8 to 28 days after injection the subjects have serious adverse events occurred during follow-up. In addition a woman had severe emesis after receiving the second dose, which resulted in emergency visits; however, she was relieved after receiving appropriate medication.

According to receiving health care of university employees and hospital admission, the present study shows that more than two thirds of studied employees received the health care and advice via e-mail in the 1st dose compared to one third of them in the 2nd dose, and less than a quarter of them received the health care through visiting the outpatient post 2nd dose, and a few numbers of them received care from doctors post the 1st dose, while fourteen and a half percent of employees received health care through hospitalization, and less than a quarter were hospitalized post vaccination. The results came in line with (26), in a study entitled " Hospital admission and emergency care attendance risk for SARS-CoV-2 delta compared with alpha variants of concern, pointed that, older adults after first vaccination were presented to hospital; this may be due to older adults were at an increased exposure to risk, so they require care visits and attendance to health care facilities.

Regarding the health consequence of university employees post covid-19 vaccination, the present study shows that more than half of studied employees suffered from health consequence, some of them had high blood pressure, and diabetic problems. Less than one quarter of studied employees had digestive problems post the 1st & 2nd doses. Also, some of them had cardiovascular, kidney, liver and thyroid problems post the 2nd dose of vaccination. This result is highly supported by (28) who studied "People who have had chronic disease might only need one dose of vaccine" found that, people who have chronic diseases, and suffer from health problems post vaccination had many stressors such as difficulty in breathing, respiratory problems, frequent feeling of tiredness, nausea and abdominal pain hypertension, diabetes. These diseases will lead to frequent hospitalization, multiple invasive problems, and feelings of anxiety. In addition, the light of (13) in England includes the participant having experienced chronic diseases that lead to frequent hospitalization and feelings of anxiety. As well, (17) mentioned that, people with chronic diseases perceived

more stress which leads to increased risk for cardiovascular diseases. In addition, a study was done by (15), in United States who found that, people suffering from chronic diseases and were treated from Covid-19 reported less satisfaction with their health, more physical discomfort, more activity limitation, and social isolation. These people commonly needed to use medication for long life which increase own feeling of stress related to continuity of the medications, and a possible occurrence of the side effects of vaccine with its health consequences. From the researcher's point of view, proper vaccination coverage could help in reducing the infection, and subsequent mortality rates due to covid-19, and may cause some health problems for some people for some times. Therefore, public health campaigns in Palestine should consider adapting to promote covid-19 vaccine in the population.

According to the university employee' knowledge in relation to covid-19 ,the current study reflected that decreasing their knowledge about Action of covid 19 vaccination and safety of vaccine as regard pregnancy aim, types of covid 19 vaccination & symptoms exposure post vaccination and safety of vaccine as regard lactating mother. This result in line with (11), in a study entitled "Intention to get vaccinations against COVID-19" in French, who pointed that, the majority of studied participant having poor knowledge about covid-19 and take it to avoid transmitting covid-19 to their families and protect themselves vulnerable to COVID-19. Another study was agreed by (16) who reported that, inadequate knowledge of the COVID-19 vaccine, long-term and severe side-effect concerns, fear of the vaccine causing the disease, and confusion about efficacy. From the researcher point of view, the great majority of studied subjects would be more knowledgeable about the vaccine when more details are available about the various types, safety, action and efficacy of vaccine.

Regarding the total score of the studied university employees' knowledge , the current study represented that more than half of the studied employees had poor level of knowledge regarding covid-19. From the researcher's point of view, the poor knowledge level of the studied employees might be due to the lack of opportunity for attending training courses, guideline booklet availability regarding covid-19, and how to deal with the health consequences in the health agencies based on people who need care of covid-19.

With reference to the university employees' perception related to receiving the covid-19 vaccine, the current study clarified that more than two thirds of studied university employees agreed that the chance of getting covid-19 in the future is very high, more than half of them disagreed that getting covid-19 is a strong possibility. Two thirds of the studied sample disagreed that vaccination will decrease the chances of getting covid-19. The majority of university employees agreed on the severity of the complications of covid-19; nearly three quarters of them agreed that a person will be very sick if getting covid-19. Nearly two thirds of them disagreed about the efficacy availability of the vaccine, however, a same percentage agreed about the availability of side effects of the vaccination, 53.2% of them disagreed on receiving vaccine after obtaining complete information. 67.4% of them agreed on receiving vaccination after a large number of people take it.

Finally, a great majority of employees assured that they received vaccination due to it being a requirement of work.

This result was consistent to some extent with the finding study done by (25) entitled "Determinants of COVID-19 vaccine acceptance in a high infection-rate country" in Russia reported that a vast majority of the study participants believed that chances of getting the infection would be reduced after taking the vaccine. On a positive note, study by (29), entitled "Acceptance of the COVID-19 vaccine based on the health belief model: A population-based survey" in Hong Kong reported that most of the participants who highly indicated that getting covid-19 is a strong possibility, and perceived the complication of the covid-19 as being very serious, received covid-19 vaccine after a large number of people took it. The participants trusted the healthcare system or vaccine manufacturers.

On the other hand, the study was congruent with the study by (8) entitled "The health belief model in predicting Health care workers' intention for influenza vaccine uptake" in Jordan who stated that, the participants who had a disagreement on perceiving the efficacy of vaccine and acceptance of the COVID-19 vaccine, where no correlation was found between perceived the efficacy and vaccination intention. Another study by (23) entitled "Susceptibility to misinformation about COVID-19 around the world" reported that, in COVID-19 misinformation significantly reduced willingness to get the vaccine. Therefore, the public should be immunized against misinformation to increase the psychological support preferably by a trusted, centralized source of information.

Regarding correlation between the total knowledge of employees and their health consequence, and perception (table 8), the current study showed that there was a positive correlation between the total of university employees' knowledge, perception and health consequence scores ($P < 0.00$). This result agreed with the study done by (14), entitled "The Health Belief Model Predicts Intention to Receive the COVID-19 Vaccine" in Saudi Arabia who reported that, there was a positive association with vaccination intent, whereas perceived barriers had a negative association ($p < 0.001$). Individuals were more likely to receive the vaccine after obtaining complete information ($p < 0.001$) and when the vaccine uptake would be more common amongst the public ($p < 0.001$).

Conclusion

In the light of the study findings, it can be concluded that, more than one quarter, and more than one third of studied employees had respiratory problems post the 1st & 2nd doses of covid vaccination respectively, less than a quarter of them had admitted staying in hospital from 1-2 weeks. In addition, more than half of the studied university employees had poor health post covid-19 vaccination. Also, there was a positive correlation between total university employee health consequence, perception and their knowledge, and there was a highly statistical significant difference between the total perception and their knowledge.

Recommendations: Evidence-based data from such studies could have an impact on policy decision makers in the health care systems, and perhaps help in designing appropriate strategies to improve the perception towards the covid-19 vaccination. Therefore, this study recommends that there is need for publicity to enlighten people about what covid-19 vaccination, in order to correct the negative perception around the vaccine

Declarations

Competing interests: The authors declare no competing interests.

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Authors' contributions:

Each author took part in the design of the study, contributed to data collections, participated in writing the manuscript and the authors agree to accept equal responsibility for the accuracy of this paper. All authors approved the final article.

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Figures

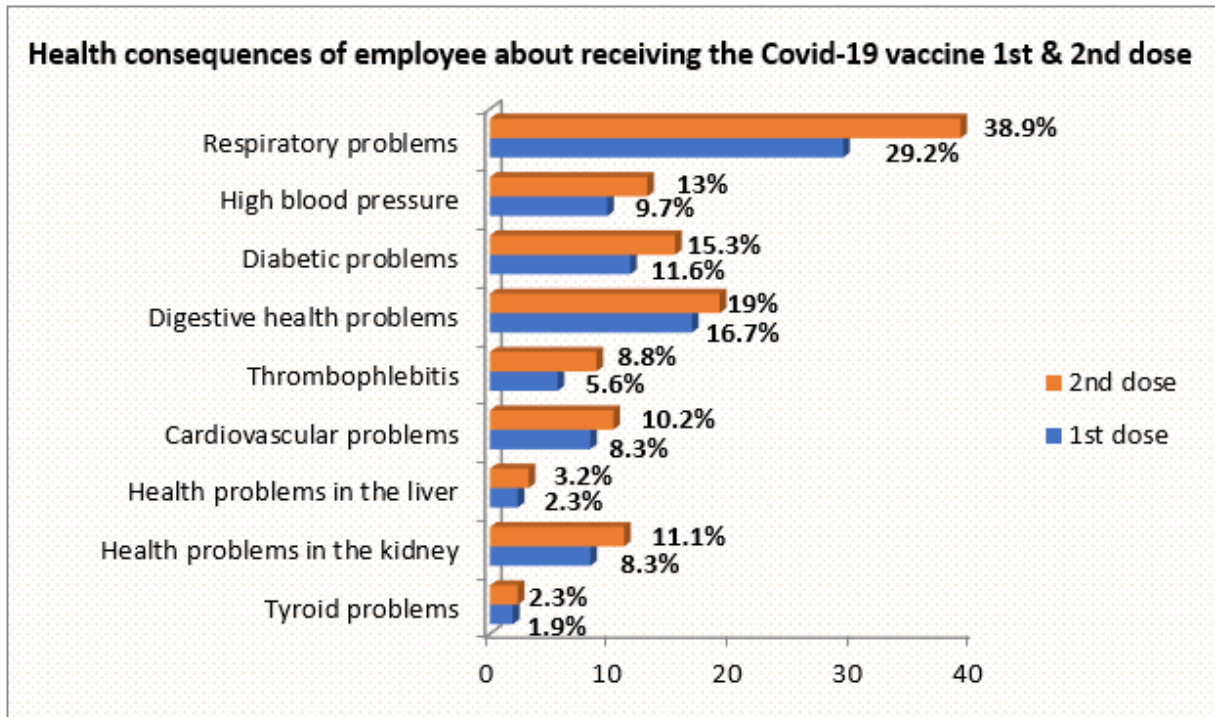


Figure 1

distribution of university employees in Palestinian universities regarding total health consequences of receiving the COVID-19 vaccine (n=216).

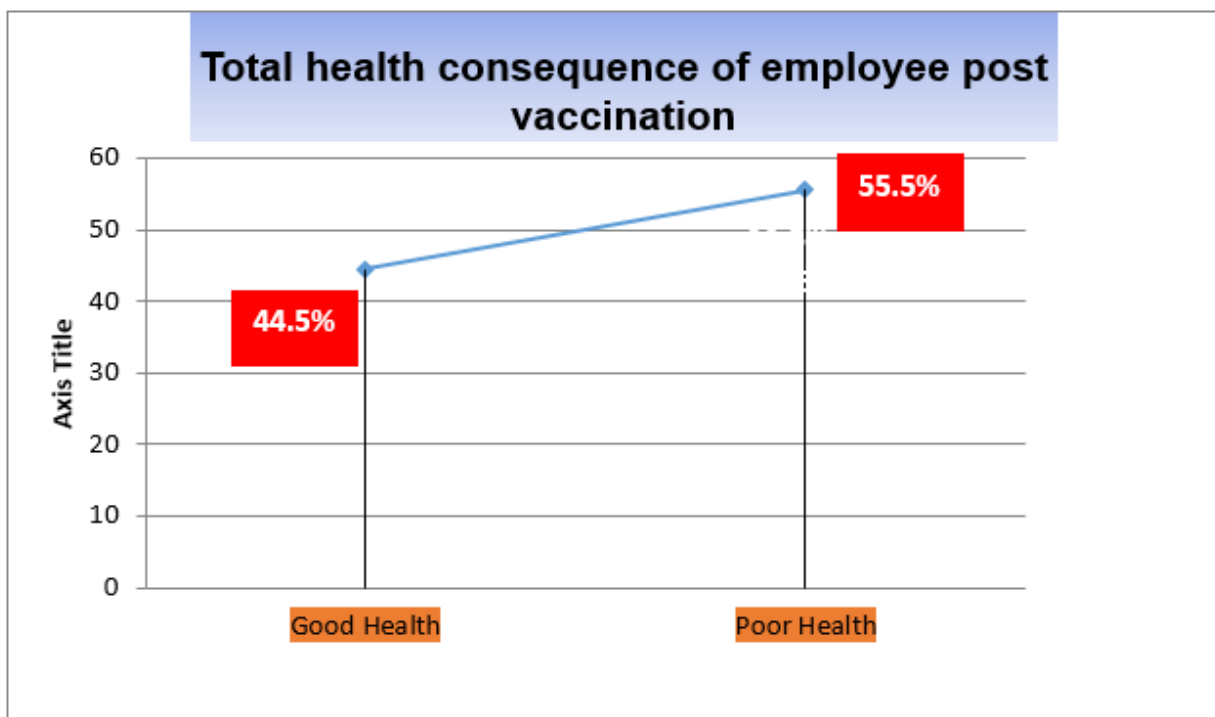


Figure 2

Distribution of the studied university employees regarding the total health consequence post vaccination (n=70)

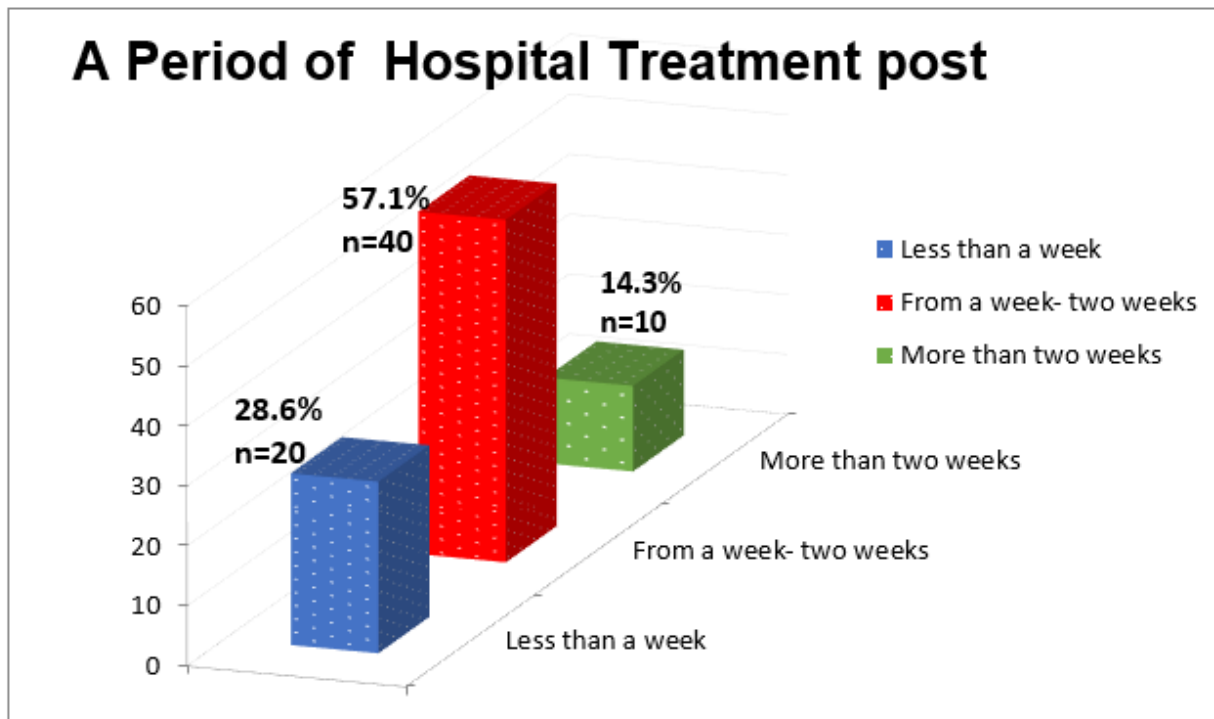


Figure 3

Distribution of the studied university employees regarding the period of hospital stay post vaccination (n=70)

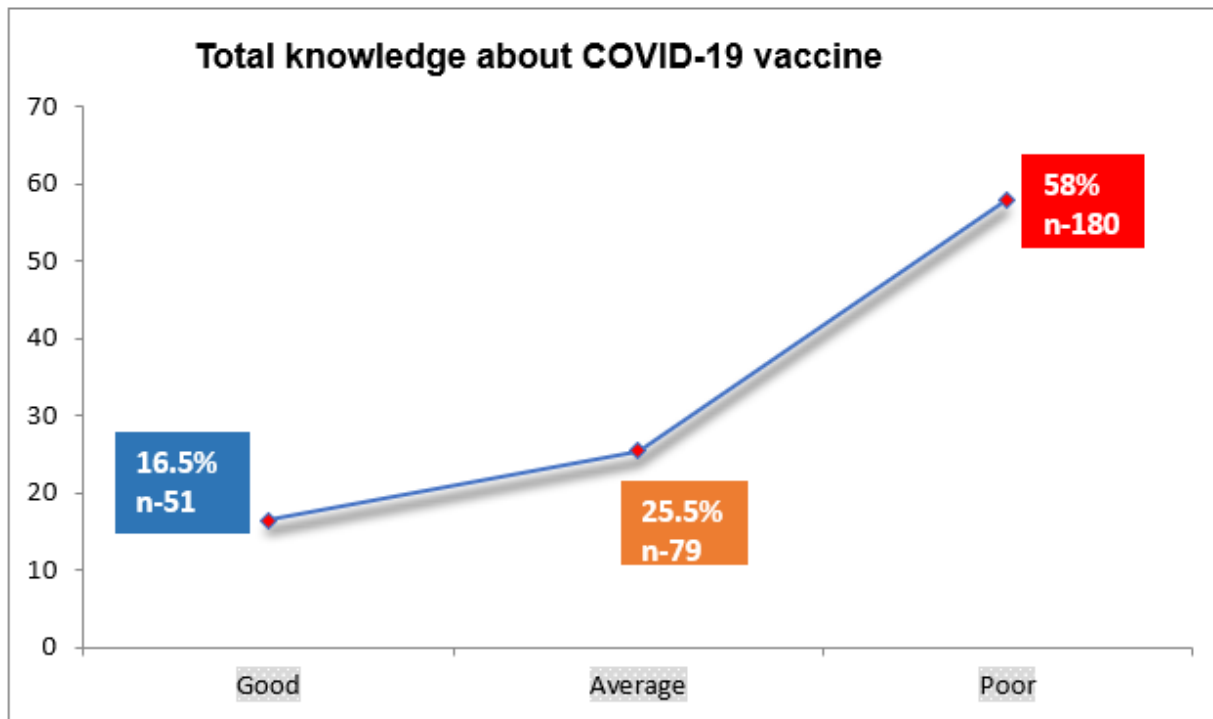


Figure 4

distribution of university staff in Palestinian universities according to their total knowledge about the COVID-19 vaccine (n=310).

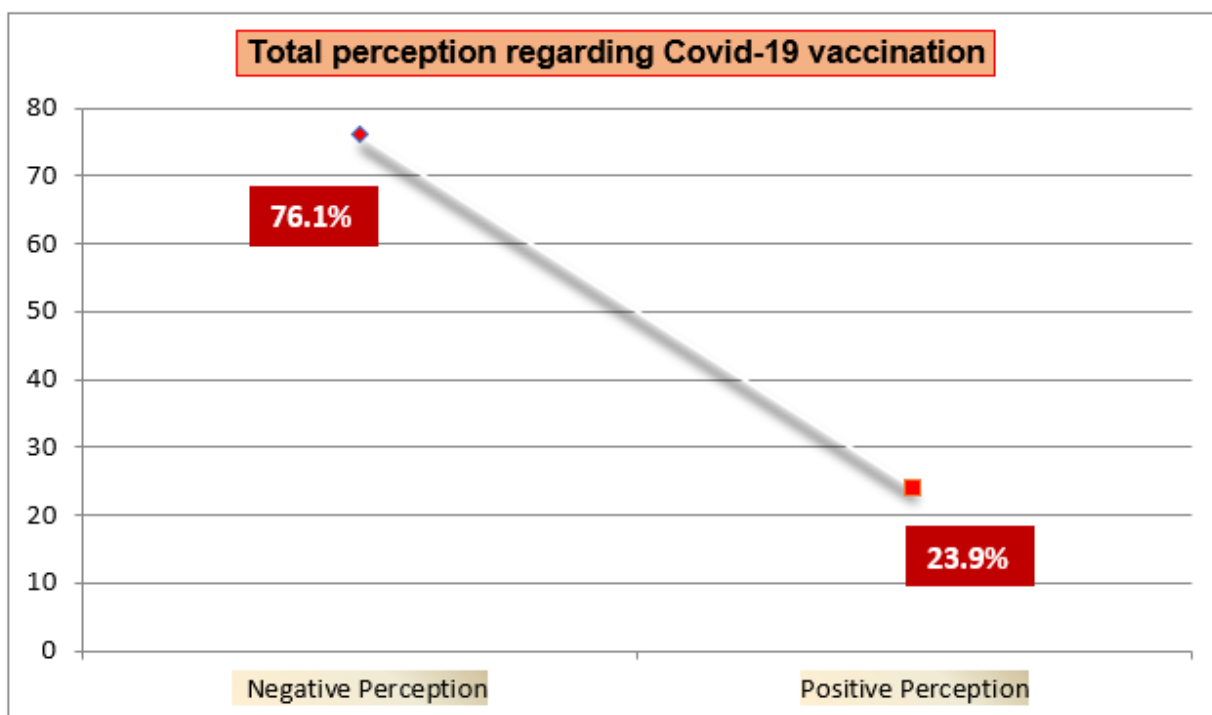


Figure 5

Percentage distribution of university employees according to their total perception regarding Covid-19 vaccination (n=320)

