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# Side Effects of Receiving Different Types of COVID-19 Vaccines

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# الآثار الجانبية نتيجة تلقي أنواع مختلفة من لقاحات COVID-19

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**Abstract**

The prevalence of vaccine side effects plays an important role in public perception of vaccination programs**. Aimed to** limit Side Effects from Receiving Different Types of COVID-19 Vaccines. **Material &Methods**: Personal interviews were conducted with specialists and stakeholders regarding public health, in addition to interviewing medical staff, including doctors and nurses in the health institutions visited. Collecting questionnaires, classifying them, and then producing them in statistical tables according to appropriate statistical programs. **Result**: the highest percent for 3 doses was 48.2 %, the lowest present for having 3 doses of different types of vaccines at 1.82 %, for those who did not receive any dose of vaccine 18.64 %, the percent and types of the dose received the vaccine, that SPUTNIKIS highs present by 25 %, followed by Sinopharm by 20.9 %, AstraZeneca by 20.5%, Pfizer by 17.73 % and who did not receive and dose from the vaccine are 15.9 %, the symptoms were from a Sinopharm vaccine especially loss of smell by 15%, Followed by AstraZeneca which who take doses of AstraZeneca were feeling symptoms at the injection site, pain all over the body, elsewhere the Pfizer vaccine the lowest effect, the symptoms were less than other types of vaccine, As for the Relationship between the type of Vaccine & the different symptoms, which P-Value P-Value < 0.05, X2, 67.951. The highest number of those who do not have chronic diseases, and they are the most exposed to symptoms, This demonstrates that there is no relationship between different Symptoms after having Vaccine & the Chronic Diseases P-Value 0 .159 > 0.05, X2, 23.881a, symptoms after vaccination in those who have chronic diseases are less than in those who haven`t any diseases, and so it was there is no relationship between the type of Vaccine & Chronic Disease, P-Value 0.055 > 0.05, X2, 15.245, The Infection with Corona after receiving the Corona vaccine is those infected with corona after taking the vaccine had the highest percentage of the Sputnik vaccine at 11% and Sinopharm at 7%, and Pfizer at 6 % the least infected with corona after taking the vaccine was the AstraZeneca vaccine with 5%. P-Value 0.156 > 0.05, X2 =11.897.

**Conclusion:** most of the vaccines had an effect on the recipients of the vaccine in the appearance of symptoms after taking the doses, but there are types that had a greater effect than

other vaccines such as Sputnik, AstraZeneca less than Pfizer and Sinopharm. Sputnik, AstraZeneca vaccine had an effect on those who suffer from chronic diseases with the return of corona infection even after taking 3 doses of the vaccine

**Keywords:** Side Effects, Vaccine, Sputnik, Pfizer, AstraZeneca, SPUTNIKIS

**الملخص**

يلعب انتشار الآثار الجانبية للقاح دورا مهما في التصور العام لبرامج التطعيم. **تهدف إلى** الحد من الآثار الجانبية من تلقي أنواع مختلفة من لقاحات كوفيد -19. **الطرق والأدوات:** تم إجراء مقابلات شخصية مع المتخصصين وأصحاب المصلحة فيما يتعلق بالصحة العامة، بالإضافة إلى مقابلة الطاقم الطبي، بما في ذلك الأطباء والممرضات في المؤسسات الصحية التي تمت زيارتها. جمع الاستبيانات وتصنيفها ثم إنتاجها في جداول إحصائية حسب البرامج الإحصائية المناسبة. **النتيجة**: أعلى نسبة على 3 جرعات 48.2 % ، وهو أدنى الحالي عن وجود 3 جرعات من أنواع مختلفة من اللقاحات في 1.82 %, بالنسبة لأولئك الذين لم يتلقوا أي جرعة من اللقاح 18.64 % ، في المئة من أنواع تلقت جرعة اللقاح ، *SPUTNIKIS*الارتفاعات الحالية بنسبة 25 % ، تليها *Sinopharm* بنسبة 20.9 *%, AstraZeneca* بنسبة 20.5% ، فايزر قبل 17.73 % و الذين لم تتلقى جرعة من اللقاح هي 15.9 %, الأعراض من *Sinopharm* اللقاح وخاصة فقدان الشم بنسبة 15%, تليها شركة أسترا زينيكا والتي الذين يأخذون جرعات من شركة أسترا زينيكا كانت أعراض الشعور في موقع الحقن, الألم في جميع أنحاء الجسم ، في أماكن أخرى فايزر لقاح أدنى تأثير الأعراض أقل من الأنواع الأخرى من اللقاح ، أما عن العلاقة بين نوع اللقاح و أعراض مختلفة ، *P-Value P-Value < 0.05, X2, 67.951.* أكبر عدد من أولئك الذين ليس لديهم أمراض مزمنة ، وهم الأكثر تعرضا للأعراض ، وهذا يدل على أنه لا توجد علاقة بين الأعراض المختلفة بعد تناول اللقاح والأمراض المزمنة ف-القيمة 0 .159 < 0.05 ، س2 ، 23.881 أ ، الأعراض بعد التطعيم في أولئك الذين لديهم أمراض مزمنة أقل من أولئك الذين ليس لديهم أي أمراض ، وهكذا لم تكن هناك علاقة بين نوع اللقاح والأمراض المزمنة ، ف-القيمة 0.055 < 0.05 ، س2، 15.245, فإن الإصابة بفيروس كورونا بعد تلقي لقاح كورونا هو المصابين كورونا بعد أخذ اللقاح أعلى نسبة من سبوتنيك اللقاح في 11 ٪ و *Sinopharm* في 7% ، فايزر على 6 % على الأقل بفيروس كورونا بعد أخذ اللقاح كان *AstraZeneca* لقاح 5%. ص-القيمة 0.156 < 0.05، س2 =11.897. **الخلاصة**: كان لمعظم اللقاحات تأثير على متلقي اللقاح في ظهور الأعراض بعد تناول الجرعات، لكن هناك أنواعًا كان لها تأثير أكبر من اللقاحات الأخرى مثل *Sputnik* و *AstraZeneca* الأقل من *Pfizer* و *Sinopharm*. كان لقاح سبوتنيك وأسترازينيكا تأثير على من يعانون من أمراض مزمنة مع عودة الإصابة بالكورونا حتى بعد أخذ 3 جرعات من اللقاح.

**الكلمات المفتاحية:** التأثيرات الجانبية، لقاح، *Sputnik, Pfizer, AstraZeneca, SPUTNIKI*

## Introduction

Considering the adverse reactions to vaccination against coronavirus disease 2019 (COVID-19), some people, particularly the elderly and those with underlying medical conditions, are hesitant to be vaccinated.[1], various types of COVID-19 vaccines had no statistically significant effects on macular or optic disc microvasculature[2], early adverse effects are reported following all types of vaccines but these are more likely to be encountered following the administration of new-generation vaccines. These side effects are mostly mild and treatable. [3], the long-awaited vaccines of COVID-19 (corona virus disease-2019) were not received by cheers in many areas of the world whether in developed or developing countries where a substantial proportion of populations cast their doubts and suspicions [4], common post-BNT162b2 Vaccination reported self-limiting side effects similar to those reported by Pfizer/BioNTech Company. However, higher rates of allergic reactions were reported in this sample. Rare side effects, such as thrombocytopenia and myocarditis[5], The newly developed and marketed vaccines along with concerns about vaccine safety and long-term side effects have been raised and alarming in the general population.[6], All three vaccines, Pfizer-BioNTech, Oxford–AstraZeneca (ChAdOx1 CoV-19) and Moderna, cause post-vaccinal adverse effects; however, Moderna and Oxford–AstraZeneca (ChAdOx1) causes adverse effects more frequently than the Pfizer-BioNTech.[7], Side effects that are reported post Oxford-AstraZeneca and Pfizer-BioNTech vaccines among in Saudi Arabia study participants

are not different from those that were reported in the clinical trials, indicating safe profiles for both vaccines.[8], Pfizer-BioNTech and Oxford-AstraZeneca administration was associated with mild to moderate, transient, short-lived side effects. These symptoms corroborate the results of phase 3 clinical trials of these vaccines. [9], side effects like headache, myalgia, tiredness and fever mainly appeared with Pfizer and AstraZeneca vaccines. Most of the reported adverse effects were tolerable and self-limited and they were linked to the AstraZeneca and Pfizer vaccines.[10] serious COVID-19 vaccine adverse effects were rare and comparisons across brands could be made, revealing that full vaccination dose, vaccine brand, younger age, female sex, and having had COVID-19 before vaccination were associated with greater odds of adverse effects. Large digital cohort studies may provide a mechanism for independent postmarket surveillance of drugs and devices. [11], Vaccines are scientifically derived preparations that stimulate the body's immune response against diseases. Many vaccines have been found to be effective in reducing death, hospitalization, and other harmful consequences from diseases [12], sometimes after vaccination, the process of building immunity can cause adverse symptoms. The PfizerBioNTech COVID-19 vaccine can induce mild side effects following the first and/or the second shot, including pain, redness or swelling at the injection site, tiredness, headaches, chills, muscle and joint aches, and fever. These symptoms could be an indication that the body is developing the desired immunity for protection [13], the COVID-19 vaccination program was positive. Several differences in the experiences of vaccine-related side effects, in terms of prevalence and numbers, were attributed to age, gender, and received vaccine type. [14], the authorized COVID-19 vaccines are safe and getting vaccinated makes people more reassured. Most of the post-vaccination side effects are mild to moderate, which are signs that the body’s immune system is building protection. ML can also be used to predict the severity of side effects based on the input data; predicted severe cases may require more medical attention or even hospitalization. [15], side effects following COVID-19 vaccination among Arab populations are usually non-life-threatening; with flu-like symptoms and injection site pain. Certain predisposing factors have greater weight and importance as input data in predicting post-vaccination side effects. Based on the most significant ML can also be used to predict these side effects; people with certain predicted side effects may require additional medical attention, or possibly hospitalization. [16], the univariate and multivariate logistic regressions showed that the type of vaccine used had a significant impact on the occurrence of adverse post-vaccination effects and the severity and duration of vaccination symptoms. In addition, chronic disease and fear of vaccination also had some influence. Despite this, most participants (more often older than younger) were in favor of compulsory vaccination against COVID-19 for HCWs. [17], German healthcare workers have at least one side effect following the COVID-19 vaccination. The mRNA-based vaccines were associated with a higher prevalence of local side effects (e.g., injection site pain), while the viral vector-based vaccine was associated with a higher prevalence of systemic side effects (e.g., headache/fatigue). [18], Vaccines against coronavirus disease 2019 (COVID-19) have played an important global role in reducing morbidity and mortality from COVID-19 infection. While the benefits of vaccination greatly outweigh the risks, adverse events do occur. Non-ocular adverse effects of the vaccines have been well-documented, but descriptions of ophthalmic effects remain limited, including proposed mechanisms, herpetic keratitis, and other reported corneal complications. Ophthalmologists and primary care physicians should be aware of such possible associations. [19], the COVID-19 vaccine is based on relatively few self-limiting side effects, mainly soreness of the injected arm and tiredness. Further research is needed to determine the long-term safety of COVID-19 vaccines, especially after booster doses. [20], after 5 months, vaccine effectiveness remained high among individuals younger than 55 years. Booster doses restore vaccine effectiveness. Adverse reactions after booster doses were similar to those after the second dose. Homologous booster schedules had fewer

reported systemic side effects than heterologous boosters. [21], Pfizer and AstraZeneca vaccines as well as the mixed vaccination protocol. A heterologous regimen was associated with fewer side effects compared to homologous vaccines. [22], more side effects were significantly associated with the AstraZeneca vaccine. Only one case for each of second dose of Pfizer and Sinopharm vaccines reported that their side effects required hospitalization. [23], Healthcare workers who got the AstraZeneca vaccination had more adverse effects than other vaccines. Injection site pain, fatigue, headache, muscle pains, and fever were the most frequently reported side effects. More research on vaccination safety is needed to understand the long-term adverse effects of vaccinations better, improve public trust, and accelerate vaccine adoption. [24].

## Material and methods

In this study, the data tools to collect data according to the following procedures:

**1- Testing**: More than 220 vaccine recipients, including males and females, were conducted. From 1 Jun to 30 December

**2 - Observation**: Through which it was known how to deal with the effects of vaccines within health institutions, and how to deal with it.

**3 - Collecting information:** from books, research and scientific theses also represented in previous journals and studies, as well as evidence from visiting isolation centres and relevant parties, access to records and statistics from government health and medical centres, as well as searching the Internet.

**4 - Personal interview:** Personal interviews were conducted with specialists and stakeholders regarding public health, in addition to interviewing medical staff, including doctors and nurses in the health institutions visited.

### Method of work:

**First:** Distributing the questionnaire to all vaccinated members of the sample and to all ages in hospitals, health centres, universities and other private institutions to fill in the required data.

**Second**: Distributing the questionnaire to doctors and specialists supervising vaccinations to know the effects and symptoms that occur after receiving the vaccination.

**Third:** Designing an electronic questionnaire on Google Drive and sending it to various social networking pages.

**Fourth:** Collecting questionnaires, classifying them, and then producing them in statistical tables according to appropriate statistical programs.

### Statistical analysis:

The data were analyzed by SPSS (Statistical Package for the Social Sciences) version 26, Categorical variables were described as frequency rates and percentages, and continuous variables were described using mean and Pearson Correlation(R), qui Squair, P-Value, and Crosstabs.

## Results and discussion

In table 1 illustrated the Demographic Characteristics Gender, Age, Marital Status, Education Levels, and Place of Living

**Table 1:** Demographic Characteristics

| Demographic Characteristics | N (%) |
|---|---|
| **Gender** | |
| Male | 59(26.8) |
| Female | 161(73.2) |
| **Age (Year)** | |
| 20 - 30 Years | 74(33.6) |
| 31 - 40 Years | 52(23.6) |
| 41 - 50 Years | 53(24.1) |
| 51 - 60 Years | 37(16.8) |
| 61 - 70 Years | 3(1.4) |
| More Than 71 | 1(0.5) |
| **Marital Status** | |
| Single | 82(37.3) |
| Married | 129(58.6) |
| Divorced | 5(2.3) |
| Widower | 4(1.8) |
| **Education Levels** | |
| University | 112(50.9) |
| High Study | 88(40.0) |
| Middle Education | 19(8.6) |
| None | 1(0.5) |
| **Place of Living** | |
| Ajdabiya & Outskirts | 3(1.4) |
| Albaida & Outskirts | 21(9.5) |
| Alguppa & Outskirts | 27(12.3) |
| Binghazi & Outskirts | 14(6.4) |
| Derna & Outskirts | 108(49.1) |
| Sabha & Outskirts | 2(0.9) |
| Tubruk & Outskirts | 7(3.2) |
| Tripoli & Surrounding Cities | 37(16.8) |
| Almareje & Outskirts | 1(0.5) |
| **Total** | **220(100)** |

Figure (1) show the number of Doses Received, the highest percentage for 3 doses at 48.2 %, the lowest present for having 3 doses of different type of vaccine at 1.82 %, as for those who did not receive any dose of the Covid vaccine by 18.64 %, 48.2 % which take 3 doses.

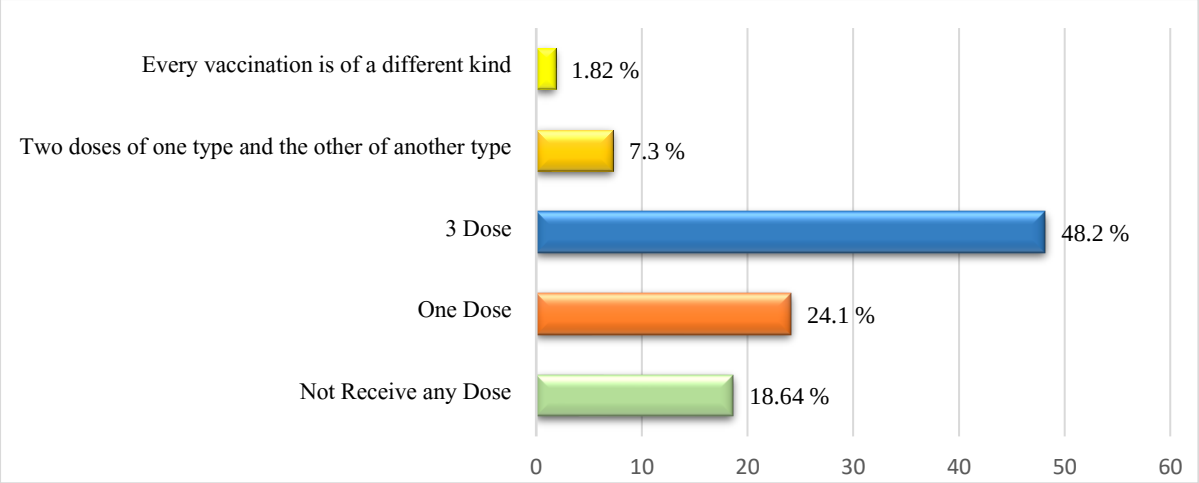


**Figure (1)** the Number of Doses Received

Figure (2) illustrated the percent and types of doses received the vaccine, where SPUTNIKIS highs present by 25 %, followed by Sinopharm at 20.9 %, AstraZeneca at 20.5%, Pfizer at 17.73 % and who did not receive and dose from the vaccine are 15.9 %.

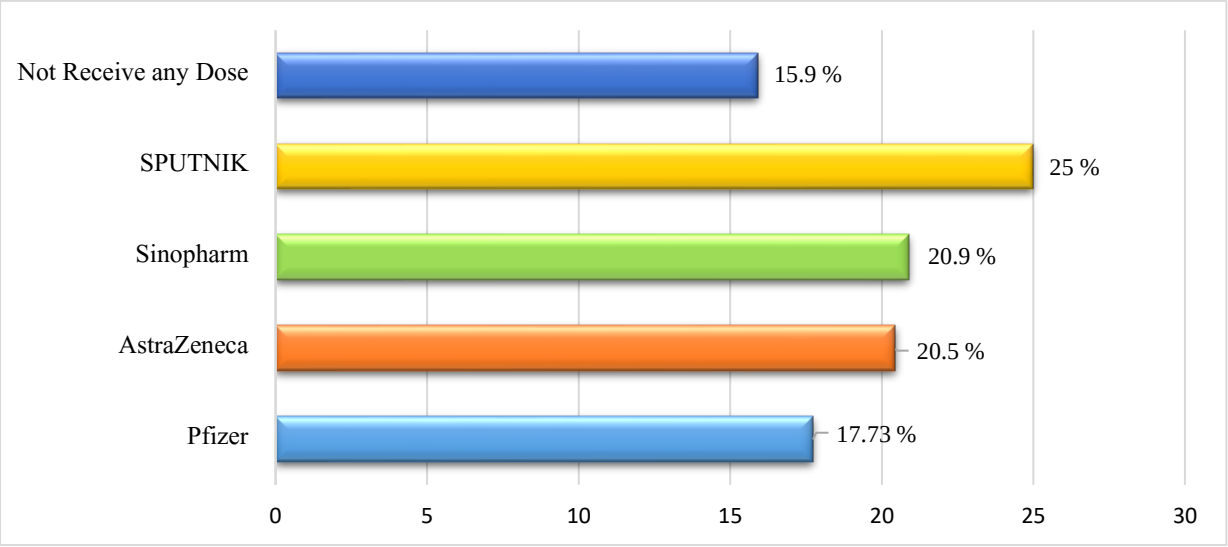


**Figure (2)** the Types and frequency of Vaccine

Figure (3) shows Most of the symptoms were from a Sinopharm vaccine especially loss of smell by 15%, Followed by AstraZeneca who take doses of AstraZeneca were feel Fever, general fatigue, redness and swelling at the injection site, pain all over the body, elsewhere the Pfizer vaccine the lowest effect, the symptoms were less than other types of vaccine, As for the Relationship between the type of Vaccine & the different symptoms, which P-Value P-Value < 0.05, X2, 67.951a that's mean that their relationship between the type of vaccine and the symptoms [23], [24]

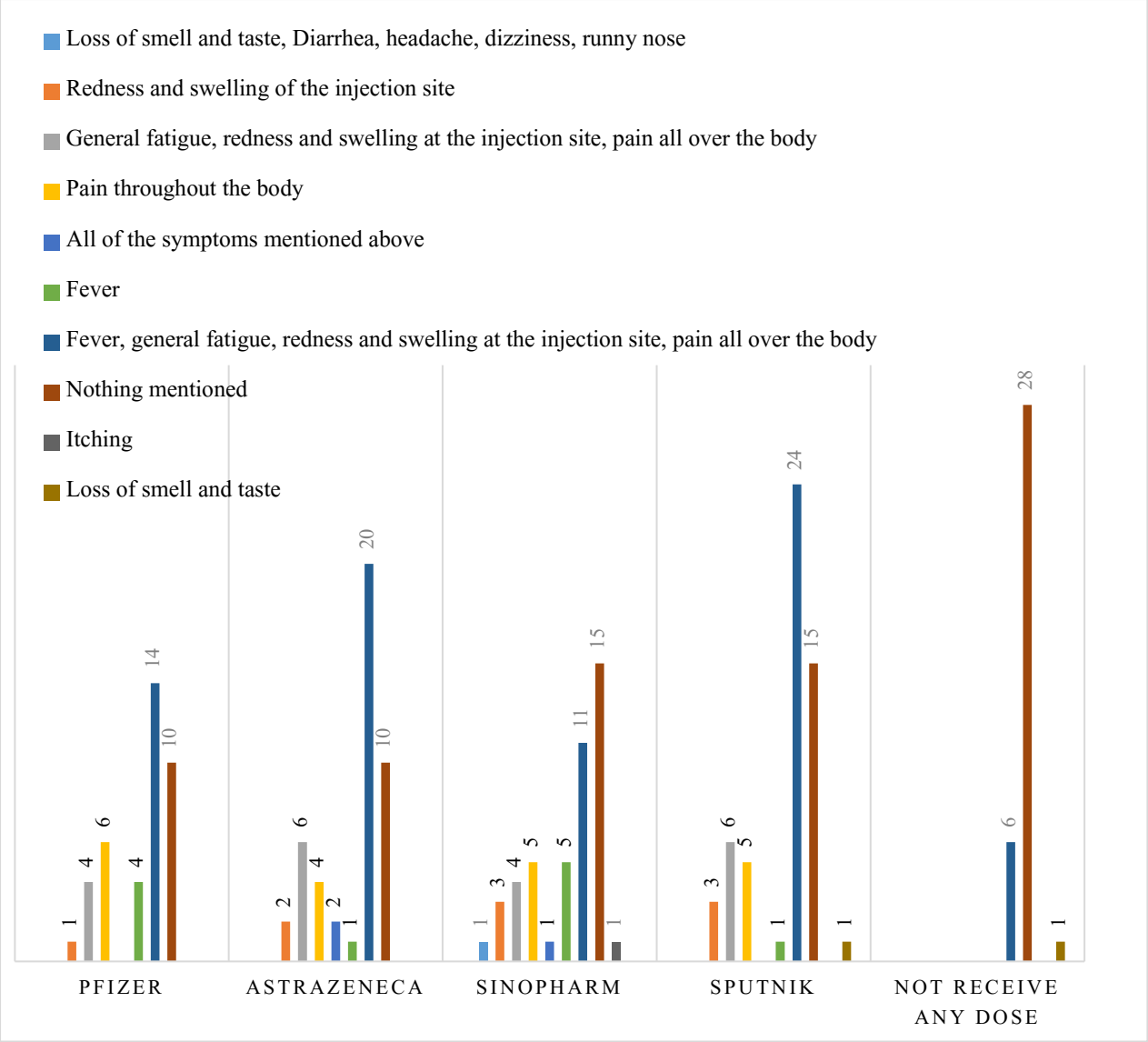


**Figure (3)** Relationship between type of Vaccine & the different symptoms

Figure (4) show that the most of symptoms were who haven`t chronic Diseases, the highest percentage are those who do not have chronic diseases, and they are the most exposed category to symptoms, this demonstrates that there is no relationship between different Symptoms after having Vaccine & the Chronic Diseases P-Value 0 .159 > 0.05, X2, 23.881a

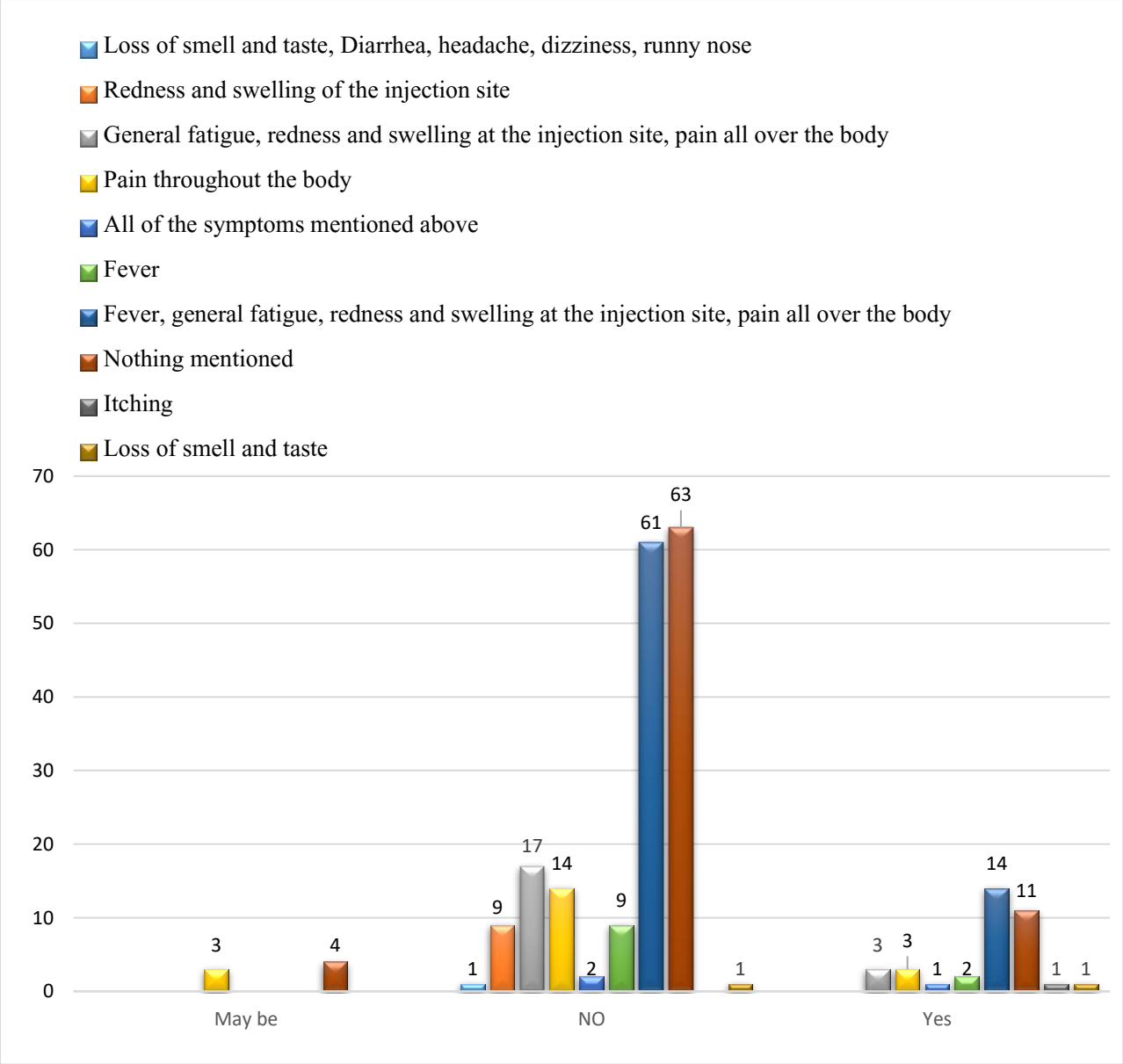


**Figure (4)** Relationship between different Symptoms after having Vaccine & the Chronic Diseases

Figure (5) show that which having symptoms after vaccination in those who have chronic diseases are less than in those who haven`t any diseases, and so it was there is no relationship between the type of Vaccine & Chronic Disease, P-Value 0.055 > 0.05, X2, 15.245[25], the graph show that the From the results, it became clear that most of the vaccines had an effect on the recipients of the vaccine in the appearance of symptoms after taking the doses, but there are types that had a greater effect than other vaccines such as Sputnik, AstraZeneca less than Pfizer and Sinopharm, Sputnik, AstraZeneca had an effect on the ear suffering from chronic diseases and the return of corona infection even after taking 3 doses of the vaccine

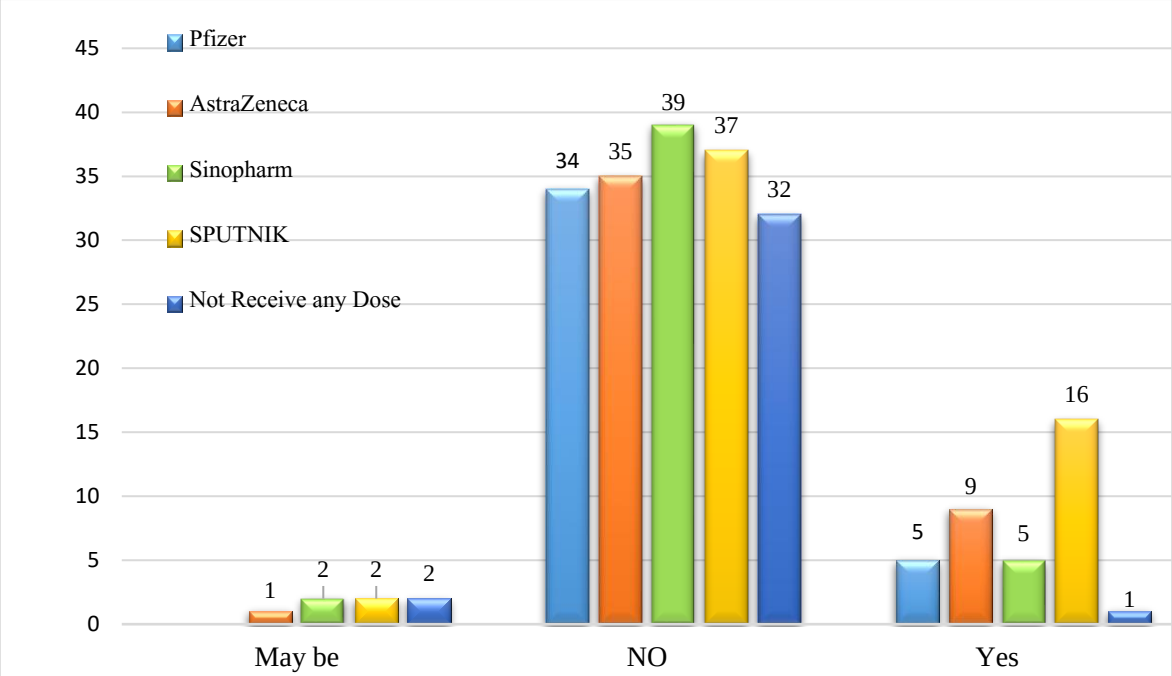


**Figure (5)** Relationship between type of Vaccine & the Chronic Disease

The Infection with Corona after receiving the Corona vaccine is illustrated in Figure (6), Those infected with corona after taking the vaccine had the highest percentage of the Sputnik vaccine at 11% and Sinopharm at 7%, and Pfizer at 6 % the least infected with corona after taking the vaccine was the AstraZeneca vaccine with 5%. P-Value 0.156 > 0.05, X2 =11.897a.That means that there is no relationship between types of vaccine and reinfection by corona[26], [11], Sputnik, AstraZeneca had an effect on the ear suffering from chronic diseases and the return of corona infection even after taking 3 doses of the vaccine.

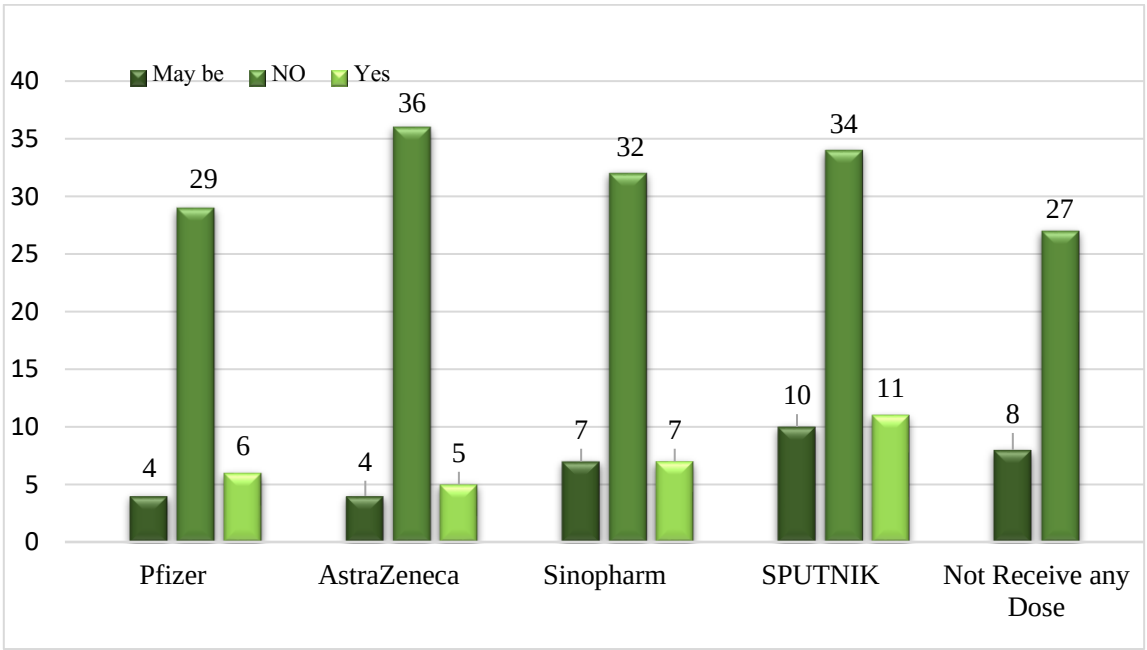


**Figure (6)** The Infection with Corona after receiving the Corona vaccine.

**Discussion**

In this study noted to Side Effects from Receiving Different Types of COVID-19 Vaccines, from the collection data the result illustrated that in table 1 illustrated the Demographic Characteristics Gender, Age, Marital Status, Education Levels, and Place of Living , In figure (1) show the number of Doses Received, the highest percent for 3 dose by 48.2 %, lowest present for having 3 doses different type of vaccine by 1.82 %, as for those who did not receive any dose of the Covid vaccine by 18.64 %, in Figure (2) illustrated the percent and types of dose received vaccine, that SPUTNIKIS highs present by 25 %, followed by Sinopharm by 20.9 %, AstraZeneca by 20.5%, Pfizer by 17.73 % and who did not receive and dose from vaccine are 15.9 %, In Figure (3) shows Most of the symptoms were from a Sinopharm vaccine especially loss of smell by 15%, Followed by AstraZeneca which who take doses of AstraZeneca were feal Fever, general fatigue, redness and swelling at the injection site, pain all over the body, elsewhere the Pfizer vaccine the lowest effect, the symptoms were less than other types of vaccine, As for the Relationship between type of Vaccine & the different symptoms, which P-Value P-Value < 0.05, X2, 67.951a that's mean that their relationship between the type of vaccine and the symptoms , In Figure (4) show that the most of symptoms were who haven`t chronic Diseases, The highest percentage are those who do not have chronic diseases, and they are the most exposed category to symptoms , This demonstrates that there are not Relationship between different Symptoms after having Vaccine & the Chronic Diseases P-Value 0 .159 > 0.05 , X2 , 23.881a, Figure (5) show that which having symptoms after vaccination in those who have chronic diseases are less than in those who haven`t any diseases, and so it was there is no relationship between the type of Vaccine & Chronic Disease, P-Value 0.055 > 0.05, X2, 15.245, and The Infection with Corona after receiving the Corona vaccine is illustrated in Figure (6) Those infected with corona after taking the vaccine had the highest percentage of the Sputnik vaccine at 11% and Sinopharm at 7%, and Pfizer at 6 % the least infected with corona after taking the vaccine was the AstraZeneca vaccine with 5%. P-Value 0.156 > 0.05, X2 =11.897a.That means that there is no relationship between types of vaccine and reinfection by corona, the result of this study illustrated There are many similarities between this study and other studies in many aspects as after the first vaccine dose, participants who received an adenoviral vector vaccine (e.g., Oxford-AstraZeneca) experienced the highest number of common side effects, and more severe levels of each side effect compared to those who received an mRNA vaccine (e.g., [18]second vaccine experienced the highest number of and most severe side effects, regardless of whether they received Moderna, Pfizer-BioNTech, or Oxford-AstraZeneca as their first dose.[25], Side effects post first vaccine dose of normal injection site pain, fatigue and headache were more common in participants aged ≤49 years versus >49 years, while pain at the vaccination site, fatigue, lethargy, headache and tenderness were the most common side effects post second dose in both groups. All side effects for both doses were more prevalent among participants aged ≤49 years.[27], a 20% increase was observed after one dose of Spikevax (RI: 1.20; 95% CI: 1.00–1.44). Fewer AEIs were reported as age increased. Types of AEIs e.g., increased neurological and psychiatric conditions, varied between brands following two doses of Comirnaty (RI: 1.41; 95% CI: 1.28–1.56) and Vaxzevria (RI: 1.07; 95% CI: 0.97–1.78). COVID-19 vaccines are associated with a small decrease in medically attended AEI incidence.[28], the inactivated COVID-19 vaccine (Vero cell), recombinant novel coronavirus vaccine (CHO cell), and adenovirus type-5 (Ad5) vectored COVID-19 vaccine made in China are safe and relatively broad-spectrum. The prevalence of AEFI is more common in women healthcare workers. The risk of AEFI was higher in those with a Bachelor's degree or above and may be related to the psychological and social effects triggered by the global COVID-19 pandemic.[29], The most common side effects of the Sputnik-V, AZD-1222 and Covaxin vaccines among Birjand (Iran) healthcare workers were injection site pain, muscle pain, fatigue, fever, and headache. Age and gender were the

most important variables in the prevalence of vaccine side effects.[26], also agree with [3], [4], [5], [6], [7], [9], [8], [10], [11], [12], [13], [14], [15], [16], [17], [18], [19], [20]. [21], [22], [23], [24], [25], [27], [2], [28], [1],

## Conclusion

From results, it became clear that most of the vaccines had an effect on the recipients of the vaccine in the appearance of symptoms after taking the doses, but there are types that had a greater effect than other vaccines such as Sputnik, AstraZeneca less than Pfizer and Sinopharm. Sputnik, AstraZeneca vaccine had an effect on those who suffer from chronic diseases with the return of corona infection even after taking 3 doses of the vaccine

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