

## SIDE EFFECTS OF COVID-19 VACCINES AMONG THE VACCINE RECIPIENTS OF KHYBER PAKHTUNKHWA, PAKISTAN

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### **ABSTRACT**

#### **OBJECTIVES**

To determine the side effects of vaccination among covid 19 vaccine recipients in Khyber -Pakhtunkhwa Pakistan.

#### **METHODOLOGY**

A cross-sectional descriptive study was conducted from 15 September to 15 November 2021 in Khyber Pakhtunkhwa. A sample of 262 participants was selected after designing an online questionnaire for data collection among those individuals who received covid vaccines such as Sinovac, Sino Pharm, Pfizer, Moderna, AstraZeneca, and Sputnik-V.

#### **RESULTS**

Among 262 participants 150 (57%) reported side effects, whereas 112 (43%) individuals don't report side effects. The most frequent side effects of covid-19 vaccination were fever 113 (69.3%), Body ache 73 (44.8%), headache 66 (40.5%), Dizziness 66 (40.5%), Muscle pain in 58 (35.6%), Fatigue 54 (33.1%) and tiredness 38 (23.3%).

#### **CONCLUSION**

The study confirmed that the selected six vaccines cause side effects, but their intensity is mild, vaccines may cause severe side effects but in rare conditions. The common side effect that occurs after vaccinations are the responsibility of our immune system, which indicate their strength against microorganism.

**KEYWORDS:** SARS-CoV-2, COVID-19, Vaccine Hesitancy, Side Effects, Vaccination

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#### **INTRODUCTION**

In December 2019 patient with an unknown diagnosis was received in the hospitals of Wuhan province of China having symptoms like flu, later

the expert identified this newly developed human virus and named it covid-19, a disease caused by the novel coronavirus SARS-CoV-2 virus. The rate of the covid-19 rate increased very rapidly in no time, and the world health organization declared it a pandemic on 11 March 2020.<sup>1</sup> The people became a witness to this pandemic that stop the global market and make people restricted to their homes. Currently, 255 million people became infected with covid-19 and 5.9 million people have lost their lives worldwide.<sup>2</sup> Pakistan is one of the

heavily populated developing countries in Asia, and it has been seriously at risk of this pandemic. The lack of resources in the health system and the economy of the country were unable to handle this huge burden, so a quick and effective response was the need of time to restrict the spread of this virus to save the country from a disaster. The formation of the National command and control center, the smart lockdowns in infected areas, restrictions on public transport, border controls, closing of institutes, and ban on public gathering were extraordinary actions taken by the government of Pakistan on time. Pakistan till now faces 4 waves of covid-19, the total cases of covid-19 in Pakistan are 1.28 million and 28,638 have lost their lives.<sup>3</sup> In Khyber Pakhtunkhwa there were many covid-19 cases (n=179000) and 5809 died due to covid-19.<sup>4</sup> The world health organization was guided regarding preventive measures and guidelines to stop the spread of covid-19 but there was still a question in the mind of people whether this will be treated or it will be prevented? Yet as there is no approved antiviral treatment for covid-19, with the hope to control this pandemic several vaccines development was initiated.<sup>5</sup> In July 2020 news regarding vaccination was released from multiple pharmaceutical companies and governments that soon covid-19 vaccine will be on the market. The news of vaccination has brought hope to people and after the final approval of the Food and Drug Administration (FDA), Pfizer became the first approved covid-19 vaccine.<sup>6</sup> Worldwide the covid-19 vaccination program became initiated, Pakistan received the Covid-19 vaccination 1<sup>st</sup> consignment on 8 February 2021 when the China people's liberation army gifted 500,000 doses to arm forces of Pakistan and the arm forces donate it to the public of Pakistan.<sup>7</sup> The first consignment vaccine of the Sino pharm was administered to front line health workers of the hospitals. Protocol of vaccines administration was set by the National command and control center (NCOC), only Pfizer vaccines for the age group of 15-18 years, 18 years and above should administer Sino pharm, Sinovac, Moderna, sputnik-v and later Cansino, and AstraZeneca for 40 years and above.<sup>8</sup> In Pakistan 78,654,489 received the first dose and 48.7 million people are fully vaccinated so far which is 22.1% of the population.<sup>9</sup> More than 8 million doses of COVID-19 vaccines have arrived in Pakistan through COVAX so far, and more are on the way, this includes 2.4 million doses of AstraZeneca, 100,160 doses of Pfizer, and 5.5 million doses of Moderna, the latter donated by the United States under COVAX dose-sharing mechanism.<sup>3</sup>

According to the center for diseases control and prevention (CDC) that after vaccination the side effects are normal and it indicates that the body is producing protection.<sup>10</sup> Common side effects are fever, headache, muscle pain, nausea, and chills. Millions of people received covid-19 vaccination so the side effects are very rare and it should be monitored and reported by the national health services.<sup>11</sup> In April 2021 from Moderna and Pfizer, some male youth and adults developed myocarditis and pericarditis which was mild and resolved quickly in the United States reported by the center for diseases control and prevention.<sup>12</sup> In Pakistan, covid-19 vaccines have caused milder side effects like headache, fever, and pain on injection sites.<sup>13</sup> Sino pharm (China), Sinovac (China), Pfizer (BioNTech-USA), Moderna (NIAID-USA), AstraZeneca (Oxford), and sputnik-V (Russian) used so far in Pakistan, multiple side effects have been observed therefore it is necessary to collect data from the vaccine recipient regarding side effects.

## METHODOLOGY

A cross-sectional descriptive study was conducted from 15 September 2021 to 15 November 2021 in Khyber Pakhtunkhwa Pakistan. The population was people who received covid-19 vaccination of Sino pharm, Sinovac, AstraZeneca, Moderna, Pfizer, or Sputnik-V. The sample size was 262. A purposive sampling technique was used. Those people who received new vaccines (Janssen, Novavax, Covaxin, and Cansino), who visit a foreign country after vaccination and those who are not willing to share their information were excluded from the study. A questionnaire was developed based on Section A, B, and C. Section A contain demographic data like (Age, education, and marital status), and Section B contains the medical and surgical history of participant like (Chronic illness, history of hospitalization, surgery, and allergies) and Section-C was about the knowledge and side effects of covid-19 side effects like (fever, shivering, body ache, lethargic, swelling and pain at injection site, alteration in sleep pattern or changes in heart rate). A trial version of the questionnaire was designed based on the side effects reports after covid-19 vaccination, then the content of the questionnaire was discussed with 5 health educator nurses, and 5 intensive care clinical nurses, and intensive care specialists. The modification was made on their recommendation for content validity. A pilot study was conducted on 20 participants who received covid-19

vaccination for internal consistency to determine the reliability of the questionnaire, the Cronbach alpha of the questionnaire was 0.86. The data was collected through Google form and later it was converted to a Microsoft Excel spreadsheet for data analysis.

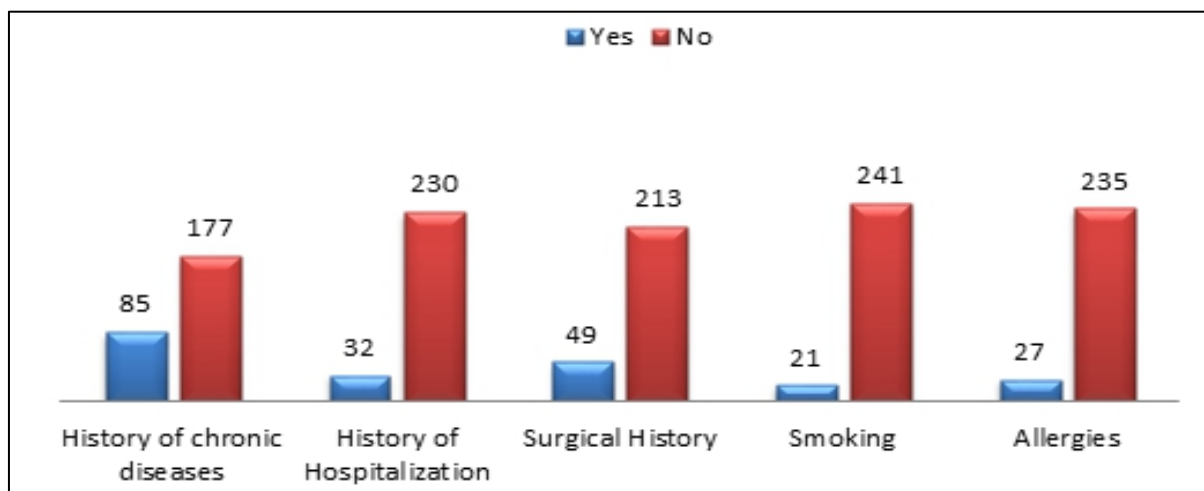
## RESULTS

Most of the participants 225 (85.4%) were males.

Vaccines recipients from 17 districts of Khyber Pakhtunkhwa participated in this study. The age of the participants was from 18 to 50 years. Majority of the participants in the study are the recipient of Sino pharm and Sinovac vaccines. The quantity of Sinovac recipient is 40% (n=105), Sino pharm 34% (n=88), Pfizer 11% (n=30), AstraZeneca 7% (n=19), Moderna 6% (n=15) and sputnik-V 2% (n=5).

**Table 1: Demographic Characteristics of the Participants.**

Variables	Male n=225 (85.4%)	Female n=37(14.6%)	Participants n=262
Districts	Malakand	4	4 (1.5%)
	Swat	154	170 (64.9%)
	Buner	20	22 (8.4%)
	Lower Dir	14	15 (5.7%)
	Mardan	6	11 (4.2%)
	Nowshera	3	6 (2.3%)
	Peshawar	3	7 (2.7%)
	Shangla	4	4 (1.5%)
	Swabi	6	7 (2.7%)
	Bara	1	2 (0.8%)
	Battagram	1	1 (0.4%)
	Kohat	0	1 (0.4%)
	Muhammad Agency	1	1 (0.4%)
	Bajaur	2	2 (0.8%)
	Canada	2	3 (1.1%)
	Chitral	2	4 (1.5%)
	Karak	2	2 (0.8%)
Age	Less than 20 years		39 (14.9%)
	20 years to 29 years		170 (64.9%)
	30 years to 39 years		43 (16.4%)
	40 years to 49 years		8 (3.1%)
	50 years and above		2 (0.8%)
Educational level	No Education		2 (0.8%)
	Primary School		2 (0.8%)
	Middle school		3 (1.1%)
	High school		32 (12.3%)
	Graduation Degree /Diploma / technical training		177 (67.8%)
	Post-graduation		46 (17.6%)
Marital Status	Single		166 (63%)
	Married		78 (30%)
	In Relation		18 (7%)



**Figure 1: Past, Medical, Surgical, and Hospitalizations History**

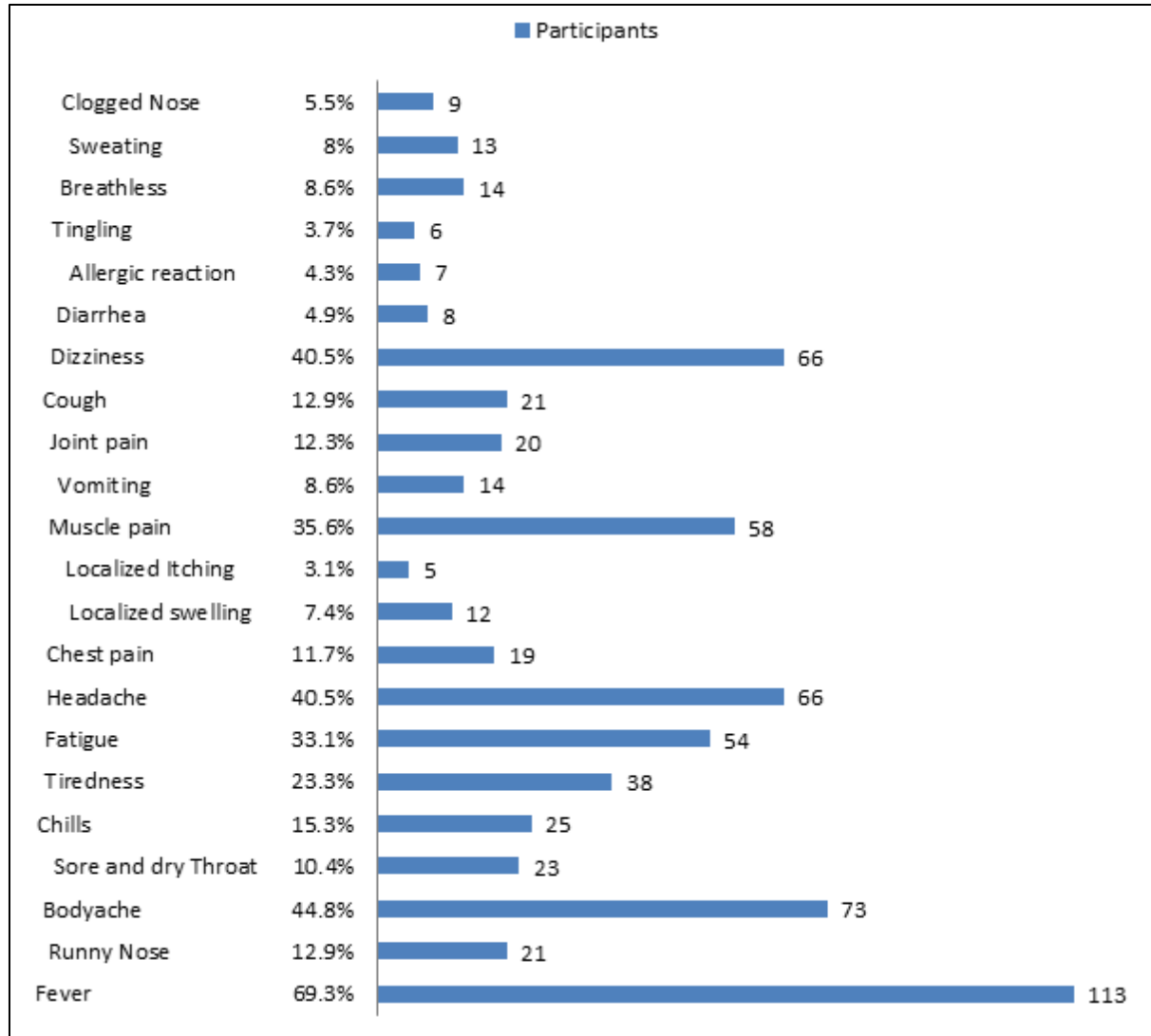


Figure 2: Side Effects of Covid-19 Vaccination

Table 2: Most Common Side Effects of the Vaccination

S.No	Vaccine	SampleSize	1 <sup>st</sup> Common Side Effect	2 <sup>nd</sup> Common Side Effect	3rd Common Side Effect
1	Sinovac	105	Fever in 50 participants	Myalgia in 28 participants	Body ache in 26 participants
2	Sino pharm	88	Fever in 35 participants	Body ache in 26 participants	Headache in 23 participants
3	Pfizer	30	Fever in 12 participants	Body ache in 4 participants	Myalgia in 2 participants
4	AsterZeneca	19	Fever in 9 participants	Body ache in 4 participants	Myalgia and runny nose in 2 participants
5	Moderna	15	Fever in 10 participants	Body ache in 9 participants	Myalgia in 2 participants
6	Sputnik-V	5	Fever in 1 participant	Body ache in 1 participant	Myalgia in 1 participant

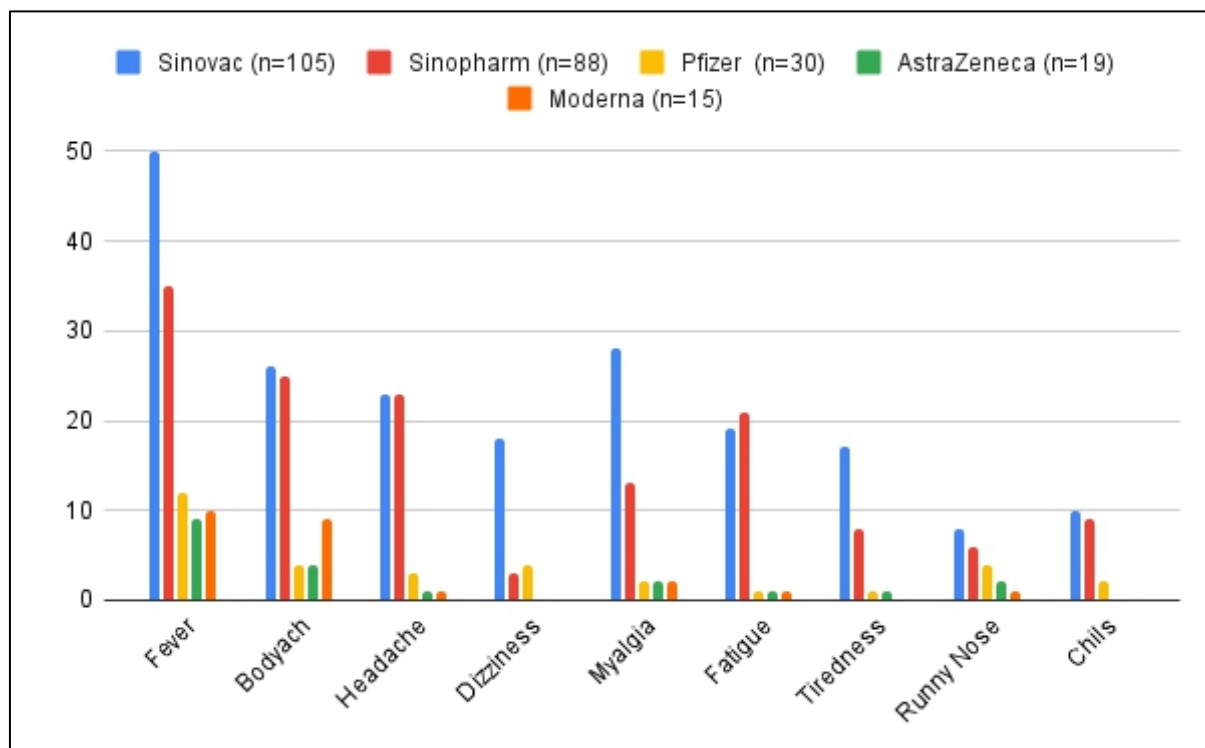


Figure 3: Comparing Common Side Effects of Different Covid-19 Vaccination

## DISCUSSION

Pakistan has the 5<sup>th</sup> biggest populated country in the world; therefore, the chances of the catastrophe were high, but the country's administration dealt very well with covid-19. In February 2021 covid-19 vaccination was received from China and then the campaign of vaccination administration became faster and faster. In this study, the most common side effects received from all vaccination were fever, myalgia, headache, and body ache. All over the world, the side effects of covid-19 Vaccination are reported, therefore Selection and administration of covid-19 vaccination seemed difficult. The side effects of myocarditis have been reported at a maximum number than expected rates in adults and adolescents who have received an mRNA COVID-19 vaccine (BNT162b2 or mRNA-1273) in the United States and Israel.<sup>14,15</sup> After the first dose of Sino pharm vaccines, some participants have reported the known symptoms from vaccination but after the second dose, the ratio of these symptoms decreased, and none of the symptoms was too increased that required hospitalization.<sup>16</sup> Furthermore, the side effects of injection site pain headache, flu, fever, and tiredness are also reported, the cases of bell palsy and lymph node swelling and tenderness are reported but very exceptional from Pfizer covid-19 vaccination.<sup>17</sup>

Similarly the tenderness and local pain around the injection site is the most commonly reported side effects, which report and last for one day.<sup>18</sup> In the United States common side effects like soreness, fatigue, myalgia, headache, chills, fever, joint pain, nausea, muscle spasm, sweating, dizziness, flushing, feelings of relief, brain fogging, anorexia, localized swelling, decreased sleep quality, itching, tingling, diarrhea, nasal stuffiness, and palpitations are also reported from Pfizer covid-19 vaccination.<sup>19</sup> In a study conducted in Turkey by Riad and others, the results show that injection site pain (41.5%), fatigue (23.6%), and headache (18.7%) were reported.<sup>20</sup> The peoples who are vaccinated with AstraZeneca have more systematic side effects comparing Pfizer vaccines.<sup>21</sup> Vaccine hesitancy is also a factor where people do not vaccinate themselves and put all the people in danger in their surroundings. In our study, 33% (n=86) were scared before the administration of the covid-19 vaccine, while In New York, approximately 29% of residents claimed that they will refuse a vaccine, compared with 20% of Canadian residents, and 6% of residents in the United Kingdom.<sup>22,23</sup> This study's findings will assist health care providers, researchers, and the public in getting the safe vaccinations with no tension as it carries minimal side effects in the population of Pakistan.

## LIMITATIONS

This study has several methodological limitations such as small sample, non-probability sample, unequal groups and only a descriptive level of analysis.

## CONCLUSION

The common side effects which occur after the administration of the covid-19 vaccination are fever, headache, body ache, chills, fatigue, tiredness, myalgia, local site swelling, tenderness at the injection site, and shortness of breath and dizziness. These common side effects remain for a short period and are relieved through bed rest and self-medication. The rare side effects which cause long-term illness are alteration in sleep pattern, changes in heart rate, and eyesight. Furthermore, a deep analysis regards each vaccination can elaborate detailed figures.

**CONFLICT OF INTEREST:** None

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### CONTRIBUTORS

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