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Reported Side Effects of COVID 19 Vaccines in Zimbabwe – A Quantitative Study of Self-reported Side Effects Experienced by Adults in Mashonaland East, Zimbabwe

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Abstract: *The COVID 19 pandemic has become one of the leading causes of severe global illnesses and deaths. Global death tolls have led the COVID 19 pandemic to become a global public health question. Vaccines were developed urgently as an emergency and appropriate response intervention strategy to end this distressing global pandemic. The aim of this study is to explore numerous side effects caused by the COVID 19 vaccines which were approved for use in Zimbabwe. The study employed a quantitative research approach and descriptive statistics. A random sampling approach was used to explore self-reported side effects of COVID 19.Results in this study show that 60% of the participants experienced side effects after the administration of the COVID 19 vaccinations. The most common side effects were injection site pains (68.3%), fatigue (65%), headaches (60%) lethargy (38. 3%) and diarrhea. Erectile dysfunction was also identified as a rare severe side effect that was reported by participants in this study (3. 3%).The results of this study show that 76.7%of the participants started to experience side effects immediately after receiving the vaccine or within the first day. 16.7% of the participants began to experience side effects in two to three days. 6.7% of the participants started to experience side effects in four days and above. Most of the participants took the vaccines willingly as they understood that the benefits of the vaccines far outweighed the potential risks. In addition, they wanted to protect themselves and others who maybe more vulnerable due to weaker immune systems. COVID 19 vaccines have different short-term side effects, although long term side effects have remained unknown in Zimbabwe. Further Scientific studies should be conducted to investigate the root cause of these side effects. This will enable the management and prevention of short and long-term effects.*

1. INTRODUCTION

The COVID 19 has become one of the global public health questions which has become one of the leading cause of severe illnesses and deaths globally. It has led to impairment of health care systems and created a burden on health professionals throughout the world (World Health Organization, 2020). COVID 19 presented a devastating experiment to researchers, health practitioners and policy makers on providing safe and adequate intervention to prevent and end this global pandemic (Kaur, Dutta, Bhardwaj, Charan, Dhingra et al, 2021). Approximately 10 million people had already suffered from this global pandemic (Anand and Stahel, 2021). The virus grew and spread rapidly globally, resulting in severe unpredicted deaths and illnesses (Saeed, Shahrabi, Alhaj, Alkokhardi and Adrees, 2021). Vaccines were developed urgently as an emergency response and appropriate intervention to end this distressing global pandemic (Saeed, Shahrabi, Alhaj, Alkokhardi and Adrees, 2021). Many vaccines were instantly approved and authorized to reduce the risk of death and severity of illness as a result of COVID 19 (Rahman, Ali, Ijaz, Afzal, Abd, 2020; Vabret, 2020). Although vaccines help to curb the risk of continuous spreading of the disease and the infection(Bernal, Andrews and Gower, 2021; Forni and Mantovani, 2021; Dagan, Bardam, Kepten, Miron, Perchik, Katz, at al, 2021), some stages of clinical trials were not systematically followed during the development of these vaccines. Despite this, vaccines are perceived as safe and being vaccinated is likely to protect one from death, reduce the risk of severity of illness and transmission of SARS –CoV-2 from one person to another (WHO, 2021; Henry, Jones, Stehlik and Glasziou, 2021). Current efforts are exerted on identifying side effects experienced by people in Zimbabwe after the administrations of COVID 19 vaccines.

The development of COVID19 vaccines had been an issue of great concern since the beginning of the pandemic (Vabret, 2020; Kaur and Gupta, 2020). Emergency and rapid development of vaccines stimulated and increased vaccine safety challenges throughout the globe (Haidere, Ratan, Nowroz,

Zaman, Jung, Hosseinzadeh and Cho, 2021; Lai, Shih, Ko, Tang and Hsueh, 2019). Since these drugs were developed as an emergency intervention, there is inadequate data on the efficacy and safety of some of the vaccines (Majeed and Molokhia, 2020). Hence, more research is in the process by means of gathering more scientific data to test the efficacy and safety of these vaccines. This research is part of the scientific inquiry to explore potential side effects of vaccines approved and authorized to be used in Zimbabwe. By exploring this, the research understudy would have done justice to the scientific inquiry in Zimbabwe.

Although, COVID 19 vaccines were authorized and approved without adequate data that is normally required for a medication to be approved, they are perceived as safe, acceptable and effective in reducing the risk of the virus and its related complications (Polack, Thomas, Kitchin, Absalon et al, 2020; Voysey, Clemens, Madhi, Weckxlet al, 2021). Similarly, (Kaur, Dutta, Bhardwaj, Charan, Dhingra, Mitra, Singh, Yadav, Sharma and Misra, 2021) argue that COVID 19 vaccines were approved without completely following all critical convectional stages of clinical trials. As a result of this, a plethora of side effects have been identified from these vaccines (Moreira, 2021; Sprent and Kings, 2021; Bunders and Altfeld, 2020; Polack, Thomas, Kitchin, et al, 2020; Baden, El, Essink at al, 2021) which tend to last for few days after vaccination (WHO, 2021). Surprisingly little is known in Zimbabwe on side effects experienced by people after taking COVID 19 vaccines.

People are experiencing different side effects from COVID 19 vaccines (Sprent and Kings, 2021). Emerging scientific researchconfirmed that side effects from COVID 19 vaccines tend to be mild and disappear within few days (WHO, 2021; Menni, Klaser, May at al 2021).Vaccines such as BioNTech mRNA and Moderna have been reported to have moderate side effects such as headaches, fatigue, myalgias, pain, redness, heart and swelling which occurs few days after vaccination (Polack, Thomas, Kitchin, Absalom, Gurtman, Lockhart, Perez, Perez, Moreira, Zerbin et al, 2020; Baden, El, Essink, Kotloff, Frey, Nocak, Diemert, Spectors, Rouphael, Creech at al, 2021). Results from a cross sectional survey study conducted by (Saeed, Shahrabi, Alhaj, Alkokhardi and Adrees, 2021) identified headache, fatigue, lethargy, pain and tenderness as side effects some people experienced after being vaccinated. Most recently diarrhea, fatigue, and muscle pain were identified as most side effects experienced after receiving the first dose of Sinovac (Jeong, 2021). Some serious rare cases of side effects have been reported in some other countries (Reno, 2021). For instance, about 518 cases of myocarditis have been confirmed in the UK after people received the doses. Additionally, many people also suffered from inflammatory diseases of heart after receiving some of the doses (European Medicines Agency). Similarly, (Moreira, 2021) note that people may experience blood clotting and heart problems after taking vaccines. Recently a positive association was found between blood clotting disorders and AstraZeneca vaccine among young people (Majeed, Papaluca and Molokhia, 2021). Thrombosis was another rare side effect identified from these vaccines (WHO, 2021). Empirical evidence on blood clotting on othervaccines has remained scant. These side effects may lead to severe illnesses such stroke, Alzheimer which later on lead to dementia which is reported as a one of the leading cause of death during the past years

Additionally, results from a study conducted in Saudi Arabia indicated that 60 % of the vaccinated population experienced side effects where about 84 % reported side effects within the first day (Alhazmi, Alamer, Daws, Hakami, Darraj, Abdelwahab, Maghfuri and Algsissi, 2021). However, these side effects tend to be more prevalent among women than males (Medical news 2021; Saeed, Shahrabi, Alhaj, Alkokhardi and Adrees, 2021). They vary from one person to another depending on sex and age (Bunders and Altfeld, 2020). Yet in Zimbabwe no study has been undertaken to explore these side effects to date. In fact, there is death of literature in Zimbabwe on types of side effects experienced by people after receiving doses and period in which these side effects start to manifest/occur. The present research seeks to explore self-reported side effects experienced by people in Zimbabwe.

The damage caused by the vaccines maybe mild and short, the impairment can be long lasting and even fatal (Reno, 2021). WHO 2021 noted that severe uncommon side effects can also be experienced

after receiving the doses. These side effects indicate the responds of the human immune system to the vaccine and are prevalent like in any other vaccines (WHO, 2021). Although these side effects occur as the immune respond to the vaccine, they compromise activities of daily living. A body may fail to respond instantly in building protection after being vaccinated leading to both mild and severe side effects. Identification of these side effects will help in management of people to prevent serious and rare side effects. WHO 2021 noted severe uncommon side effects can also be experienced after receiving the vaccination. The current study tests the hypothesis that COVID 19 vaccines used in Zimbabwe are associated with different side effects.

Short term effects of COVID 19 vaccines are disturbing (Sprent and Kings, 2021) and unknown long terms effects might be devastating leading to death and disabilities later in life or vice versa. Researchers have given less attention to the causes of these side effects (Sprent and Kings, 2021). Yet understanding the root cause of short term effects maybe a stepping stone in predicting long term effects. Despite these short term effects of the vaccines, literature has remained blurred on how long a vaccine can protect an individual from COVID 19 and how much the vaccine prevents one from contacting the virus and passing the virus to another person. Despite death of literature on efficacy and safety of vaccines in Zimbabwe, some emerging literature shows that COVID 19 may be administered safely without post severe side effects (Kaur, Dutta, Bhardwaj,Charan, Dhingra, at al ,2021). This has attracted the present researcher to explore self-reported side effects of COVID19 in Zimbabwe.

2. Efficacy of Vaccines

Oxford- AstraZeneca had an overall efficacy of 63 % in preventing the risk of COVID 19 and BNT162b2 has approximately 95% level of efficacy as well (Alhazmi, Alamer, Daws, Hakami, Darraj, Abdelwahab, Maghfuri and Algsissi, 2021). BNTI62B2 has shown an efficacy of 52 % during the first dose (Menni, Klaser, May at al 2021). Contrary in another ChAdOxL had an efficacy of 76 % during the first dose within 22 to 90 days after being vaccinated (Voysey, Clemens, Madhi et al, 2021; Voysey, Clemens, Madhi et al, 2021).

Sinopharm has an efficacy of 86% Xia, Duan, Zhang, Zhao, Zhang, Xie and Yang, 2020). It is 100 % effective and efficient in reducing the risk of severe illness and death (Cyranosk, 2020; Zahid, Moosa, Perna and Ebtisam, 2021). Surprisingly, there is inadequate scientific research on side effects of Sinopharm although mild side effects (Saeed, Shahrabi, Alhaj, Alkokhardi and Adrees, 2021. Sinopharm is one of the drugs which is used in Zimbabwe. Approximately 4000000 people have been vaccinated to date in Zimbabwe. Yet to date, scholars have failed to identify even side effects of this vaccine in Zimbabwe. The main objective of this research is to explore self-reported side effects experienced by people after receiving the vaccine.

Sinovac was authorized and approved as an emergency vaccine to curb the risk of COVID 19 which has an efficacy of 50.4 % in (Jeong, 2021). However, although this vaccine was authorized and approved to be used in Zimbabwe but the level of efficacy is very low. Little is known on efficacy of this vaccine in Zimbabwe.

Little is known to date in Zimbabwe on both short and long terms effects of the vaccines which are being used in Zimbabwe although people are still being vaccinated. The level of uptake of vaccination is very low in Zimbabwe although mandatory vaccinations which are not in line with theWHO guidelinesare being enforced. There is no vaccine which has been developed locallyin Zimbabwe. The country is relying on different drugs exported from different countries. Currenty, to the best knowledge of the present researchers, no scientific research has been undertaken to explore even side effects presented by COVID vaccines used in Zimbabwe. This motivated the current researchers to explore self-reported side effects of doses which are used in Zimbabwe. Additionally, the study explores types of side effects, time taken for these side effects to manifest and the timeframe these side effects will last. The current study focused on the side effects of the first dose. Research outcomes from this research shall immediately add knowledge to the non-existing body of knowledge on side effects. It will draw the attention of many scholars in Zimbabwe to explore .

3. RESEARCH METHODOLOGY

The study employed descriptive survey design to explore self-reported side effects of COVID 19. A random sampling approach was used in this study. The study included participants who either have received first or second doses only and excluded participants who refused to produce their valid COVID 19 vaccination card. The questionnaire was divided into three sections. The first section was covering demographic information of participants such as gender, age, education level and employment status. The second part of the questionnaire was focusing on data related to COVID 19 vaccine such as whether a person experience side effects or not, side effects associated with the vaccine, time frame in which these side effects started to manifest. The last section of the questionnaire was focusing on factors which motivated participants to take the vaccine. The questionnaire was administered by the principle investigator of the study to those participants who were selected to participate in the study. The ministry of health of Zimbabwe initially aimed at vaccinating 10 million people by the end of 2021. Hence, a sample size of 100 was determined to be more sufficient to provide a confidence of interval of 95% with a margin error of 5% for a population of about 14 million. Descriptive statistics were employed to the collected data using SPSS version 21. Customs tables were also used to explore factors which motivated people to take vaccine.

4. RESULTS

4.1. Demographic Information and Participants Characteristics

Table 1. shows demographic data of respondents who participated in this study to explore self reported side effects of COVID 19 vaccines. Of the participants,60 (60%) were females and 40(40%) were males. Approximately,8(8%)had attended primary education and below,18(18%) high School qualification ,10(10%) were holders of diploma's degree, 35(35%) were holders of Bachelor's degree,25 (25%) postgraduate qualification and 3(3%) were holders of Doctorate degree indicating that the study involved all people with different academic backgrounds. A total of 40(40%) participants were aged 18-35 years,38(38%) were aged 36-54 years, 18(18%) were aged 55-64 years and finally 4(4%) were aged 65 years and above. A total of 41(41%) received sinovac, 35(35%) received sinopharm, 17(17%) received sputnik V and 9(9%) received Janssen (Johnson and Johnson). Out of 100 respondents who participated in this study,60(60%) experienced side effects after taking COVID 19 vaccine.

Table1. *Demographic information*

Variable	Outcome	f(%)n=100
sex	Male	43 (43%)
	Female	57 (57%)
Education	Primary	8 (8%)
	High school	18 (18%)
	Diploma	10 (10%)
	Undergraduate degree	35 (35%)
	Post graduate degree	25 (25%)
Age	18-35	40 (40%)
	36-54	38 (38%)
	55-64	18 (18%)
	<65	4 (4%)
Type of vaccine	Sinovac	41 (41%)
	Sinopharm	35 (35%)
	Sputnik V	17 (17%)
	Janssen (Johnson and Johnson	9 (9%)
Side effects	Experienced side effects	60 (60%)
	Did not experience side effects	40 (40%)

Table2. *Types of side effects identified after the administration of COVID 19 vaccine and general characteristics*

Characteristics	Participants with side effects=60
Fatigue	39(65%)
Headaches	36(60%)
Injection site pain	41(68.3%)
Diarrhea	20(33.3%)
Lethargy	23(38.3%)
Erectile dysfunction	2(3.3%)
Time side effects began to appear	
Within 24 hours	46(76.7%)
2-3 days	10(16.7%)
4 days and above	4(6.7%)

A total of sixty participants (60%) experienced side effects as a result of COVID 19 vaccines as indicated in table 2 above table. Injection site pain, fatigue and headaches were identified as the most common side effects side effects in this study (68.3%, 65% and 60% respectively). Lethargy was also less reported by respondents (38. 3%) in this study. Diarrhea is also another side effect reported by twenty participants (33.3%) in this study. Erectile dysfunction was also identified as another serious rare side effect reported by participants in this study (3.3%). This shows that people are experiencing different side effects after talking COVID 19 vaccines in Zimbabwe. Forty-six of the participants (76.7%) started to experience side effects immediately after receiving the vaccine within the first day and 16.7% of the participants began to experience side effects in two to three days. Finally, 6.7% of the respondents started to experience side effects in four days and above.

Table3. *Factors which motivated people to take the vaccine, n (100)*

Factors which motivated you to take the vaccine	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I took the vaccine willingly because i wanted to protect myself and others	2.0%	5.0%	16.0%	41.0%	36.0%
I took the vaccine because there are many advantages than risk associated with the vaccine	2.0%	4.0%	24.0%	50.0%	20.0%
I took the vaccine because I felt that many people were taking the vaccine	26.0%	43.0%	18.0%	12.0%	1.0%
I took the vaccine because of fear of losing my job or to be expelled from school.	24.5%	32.7%	18.4%	19.4%	5.1%

Most of the respondents agreed that they took the vaccine willing because they wanted to protect themselves and others from COVID, 36% strongly agree and 41% agree. However, 16% remained neutral, 5% disagree whilst only 2% strongly disagree. Additionally, majority of the respondents or 20% strongly agree and 50% agree that they took the vaccine because they felt that the vaccine have many advantages than risk than risk. Yet, 24% remained neutral, 4% disagree and 2% strongly disagree. Few people took the vaccine because others were taking it, 1% and 12% strongly agree and agree respectively. However, majority of the participants in this study disagree, where 26% strongly disagree whilst 43% disagree. Only 18% remained neutral. Finally, 24.5% strongly disagree whilst 32.7% disagree that they took the vaccine because of fear of losing their jobs or to be expelled from school. This indicated majority of the respondents disagree with the statement that they took the vaccines as a result of fear. Surprisingly, 18.4% remained neutral, 19.4% agree whilst 5.1% strongly agree.

5. Discussion of Findings

Covid 19 vaccines were developed urgently as an emergency response and appropriate intervention to end this distressing global pandemic (Saeed, Shahrabi, Alhaj, Alkokhardi and Adrees, 2021). These vaccines were instantly approved and authorized to reduce the risk of death and severity of illness as a result of COVID 19 (Rahman, Ali, Ijaz, Afzal, Abd, 2020; Vabret, 2020). Results shows that people experience different side effects after receiving COVID 19 vaccines. The most self-reported side effects in Zimbabwe are injection site pain (68.3%), fatigue (65%), headaches (60%) lethargy (38.

3%) diarrhea and. These side effects are similar to side effects identified in previous studies (Alhazmi, Alamer, Daws, et al202; Polack, Thomas, Kitchin, Absalon et al, 2020; Voysey, Clemens, Madhi, Weckxlet al, 2021, previous side effects Erectile dysfunction (3. 3*%).* However, unlike previous studies, erectile dysfunction is one of the serious rare side effect which was discovered in Zimbabwe. Most of these studies on side effects of COVID 19 were conducted in western countries. These side effects indicate the responds of the human immune system to the vaccine and are prevalent like in any other vaccines (WHO, 2021). Surprisingly, some people many not experience these side effects. For instance, 40% of the participants did not experience side effects, indicating that the immune system responding from the vaccine vary from one person to another.

A study conducted in Saudi Arabia indicated that 60 % of the vaccinated population experienced side effects where about 84 % reported side effects within the first day (Alhazmi, Alamer, Daws, Hakami, Darraj, Abdelwahab, Maghfuri and Algsissi, 2021). Contrary to this, 76.7% of the respondents started to experience side effects immediately after receiving the vaccine or within the first day and 16.7% in two to three days in this study. Additionally, 6.7% of the respondents began to experience side effects in four days and above. However, these side effects disappear within few days (Menni, Klaser, May, at al 2021). It should be noted that most of the respondents took the vaccine willingly without fear because they wanted to protect themselves and other others. Additionally, people took the vaccine because it is perceived as having many advantages than risk.

6. Conclusion

This study shows that COVID 19 vaccines have different side effects such headaches, fatigue, diarrhea, lethargy, injection site pain and erectile dysfunction. Most of these side effects tend to appear immediately after receiving the vaccine although others may start to experience side effects after two to three days and four days and above as well. None of the respondents was hospitalized due to these side effects. These side effects started to appear within the first five days although most of the people experienced them immediately after receiving the vaccine, indicating that these side effects may occur as the immune system responds to the vaccine. The side effects are similar to other side effects experienced by people in some other countries. However, erectile dysfunction was identified as a new side effect experienced after taking COVID 19 vaccine in Zimbabwe.

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