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The Impact of Receiving Some Corona COVID-19 Vaccines on the Mental Health of Algerian Athletes

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Abstract:

This study aimed to assess the psychological state of Algerian athletes after receiving some anti-COVID-19 vaccinations, as a cross-sectional survey on the Internet was used to collect data on demographic and social variables. Moreover, the psychological state of the athletes was evaluated for several psychological symptoms using theSCL90-Rscale. A total of 329 vaccinated athletes participated in this study, of whom 300 completed the survey with a rate of 91.18%.Receiving the Sinovac and Sputnik V vaccines adversely affectsthe mental health of Algerian athletes, unlike the AstraZeneca vaccine which had no apparent effect except for the appearance of high levels of SOM.High levels of the following symptoms have been reported: SOM; ANX; PHOB for the Sinovac vaccine. In addition, significant increase in symptoms SOM; INTER; ANX; PHOB; PSY with respect to the Sputnik V. Our findings indicate that some vaccines, in addition to their effect on physical health, also affect the mental health of athletes

Keywords: Covid-19 Vaccines, Mental Health, Athletes.

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1. INTRODUCTION

Extraordinary efforts are being made to produce and develop anti-Coronavirus disease 2019 (COVID-19) vaccines in various parts of the world (Guido Forni, 2021); (Peter J. Hotez, 2021); (Victor Mazereel, 2021).Especially with the increasing pressure on the scientific community to find quick and radical solutions to discover vaccines in order to contain and control the pandemic (Charles, 2021). However, initial reports in the early stages of vaccine distribution indicate an unwillingness to vaccinate and hesitation in obtaining the vaccine due to widespread concerns about the efficacy and safety of vaccination against COVID-19 (Dalia Almaghaslah, 2021); (Chao Wang, 2021), such as short-term and long-term damage (Tsatsakis, 2020), the time to produce the vaccine and obtain the license (Young Chan Kim, 2020), lack of trust in the government (Carl A. Latkin, 2021).

There are several vaccines against COVID-19 that have been approved by the World Health Organization (WHO) for use (based on the Emergency Use Authorization Protocol). In November 2021 (Philip R. Krause, 2020), the following vaccines had been approved for emergency use: The AstraZeneca-Oxford virus vector vaccine, the chimpanzee adenovirus, has been genetically modified to limit its reproduction. The gene for the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) virus spike protein is then inserted into the genome of this viral vector. Once injected, the virus enters muscle cells. Then it produces the Spike protein that allows the immune system to learn, to recognize and to fight the SARS-Cov-233 virus (Maria Teresa Mascellino, 2021); Sinovac vaccine: this vaccine contains the Coronavirus that is inactivated by various chemical processes in the laboratory. The envelope of this virus remains the same, during the injection, the immune system learns how to recognize it and defend itself against the virus (Xiuju Chen, 2022); The Sputnik V vaccine is similar to the AstraZeneca laboratory vaccine, the Russian vaccine uses the principle of the viral vector, and it uses two adenoviruses, responsible for the common cold, that have been genetically modified so that they do not reproduce, and a gene encoding the Spike protein has been integrated into their genome (Baraniuk, 2021).

Emerging evidence indicates the emergence of psychological effects in individuals after receiving different doses of the vaccine, as people found it difficult to resume their activities that they used to practice before the outbreak of

the pandemic (Taylor, 2019), such as gatherings in closed spaces without wearing masks, feeling unsettled and uncomfortable, and even more afraid of infection (Robert Lovrić, 2020).

The changes associated with the pandemic have created enormous feelings of fear and anxiety due to the risks of disease and death (Tom Pyszczynski, 2021). In addition, to the repercussions of the pandemic on many areas of life, even though someone has had a vaccine, they may find it difficult to let go of this fear; because it overestimates the risks and possibilities (Winfried Rief, 2021). However, many psychological issues and problems remain obscure and poorly understood.

Accordingly, we aimed to assess the psychological state of Algerian athletes after receiving different vaccines for COVID-19, and to compare the psychological effects after receiving these vaccines.

2. MATERIAL AND METHODS

2.1. Study design and sampling

A web-based cross-sectional survey, the link of the survey was sent through emails and mainstream social-media. The participants were encouraged to roll out the survey to as many athletes as possible. The data collection was initiated on Octobre 22th, 2023 at 04:00 PM and closed on November 03rd, 2023 at 8:00 PM. We were able to collect data from across various states of Algeria. The survey took about 15 minutes per participant. We were able to collect data from across various states of eastern Algeria. The socio-demographic variables included gender, sports type, daily use of social media, Coronavirus infection, suffering from a chronic disease provided that the sports player is at least 18 years old. The survey was sent to 329 people, 300 participants answered it, with a response rate of 91.18% and their characteristics are shown in Table 1. The psychological impact of receiving the COVID-19 vaccine was evaluated with an Arabic version of Symptom Checklist-90-Revised (SCL 90-R) which has been validated (Al-Behairy, 1984), It is one of the most widely used scales for examining mental health symptoms within the last seven days (Danilo Carrozzino, 2016); (Mahin Delara, 2015) includes ninety items (Chang-Kook Yang, 2005) spread over nine dimensions as follows: Somatization “SOM”(alpha = .83); (alpha

= .83); Obsessive-compulsive "O-C"(alpha = .75); Interpersonal sensitivity "INTER" (alpha = .81); Depression "DEP"(alpha = .80); Anxiety "ANX"(alpha = .82); Hostility "HOS"(alpha = .70); Phobic anxiety "PHOB"(alpha = .80); Paranoid Ideation "PAR"(alpha = .73); and Psychoticism "PSY"(alpha = .83). In addition, a general index of distress can be obtained (alpha= .96) (Abdallah, 1998), takes about fifteen minutes to answer the scale on the Likert 5-point scale, which is based on 0 = "Not At All"; 1 = "A Little Bit"; 2 = "Moderately"; 3 = "Quite A Bit"; and 4 = "Extremely"(Geoff Goodman, 2014). Indicates get the participant on higher scores on the SCL 90-R to more severe symptoms (Noelle E. Carlozzi, 2008); (Arıcak, 2009).

Table 1. Descriptive Statistics of Sample (N= 300).

Socio-Demographic Characteristics	(N)/ %
Gender	
Male	180 (60%)
Female	120 (30%)
Sports Type	
Individual Sports	170 (56.7%)
Team Sports	130 (43.3%)
Use social media daily	
>2h	90 (30%)
Between 2h and 4h	130 (43.3%)
<4h	80 (26.7%)
Coronavirus Infection	
Yes	36 (12%)
No	264 (88%)
Suffering From a Chronic Disease	
Yes	46 (15.3%)
No	210 (84.7%)

Source: Spss[22] Program Outputs

2.2. Statistical analysis

Descriptive analyses were conducted to describe the Socio-demographic characteristics for our study sample. A T-test was used for paired samples to identify the significance of the differences between the pre and post tests for each group in relation to SCL 90-R.The One-Way analysis of variance test was used to identify the significance of the differences between the post tests for the three groups used in the study, and the one-way analysis of variance test was used to determine the equivalence between the three research groups in SCL 90-R. The Tukey HSD test was used to find differences in favor of any of the three groups.

All data were analyzed using Statistical Package for Social Sciences (SPSS) version 22.0. P-values of less than 0.05 were considered statistically significant.

3. RESULTS

3.1 Socio-demographic Characteristics

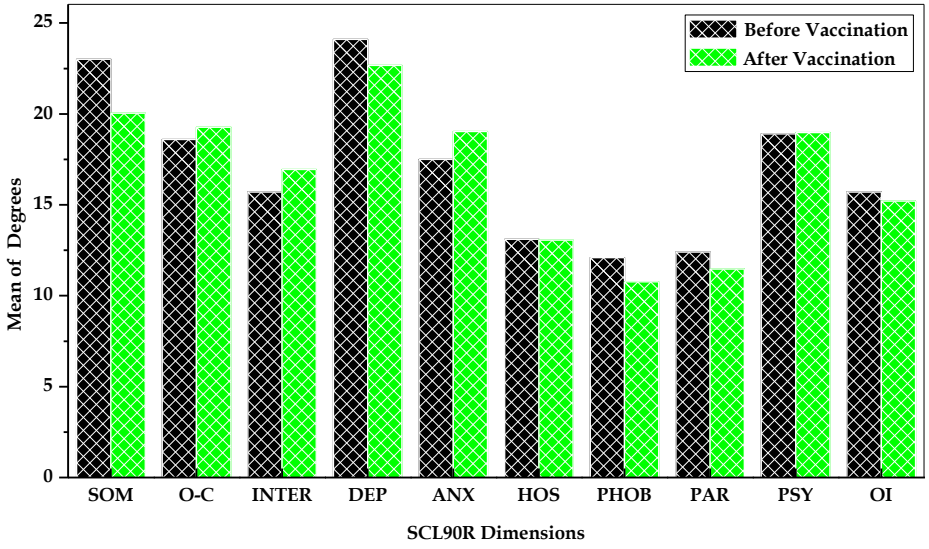
A total of 300 athletes participated in this study, 180 (60%) males and 120 (40%) females. 170 (56.7%) athletes practice individual sports. 130 (43.3%) of the study sample spend from 2 to 4 hours a day on various social networking sites. Of all the athletes, only 36 (12%) contracted COVID-19, and 46 (15.3%) of the athletes had chronic diseases.

3.2. Examining the Differences in SCL 90-Rand its Dimensions between Study Groups:

The results of the Oxford-AstraZeneca vaccine that there were no statistically significant differences between the pre and post-tests (T= -1.279; P= ,211),and thus the stability of the SCL 90-R of the group of athletes who received this vaccine. The results also revealed that the athletes who received the Oxford-AstraZeneca vaccine have SOM symptoms days after receiving a dose of the vaccine (T= -6,949; P= ,000), the symptoms of PHOB were also reported to be significantly greater compared to their mental health conditions before receiving

the vaccine (T= -2,364; P= ,025). There are no statistically significant differences with regard to the following psychological dimensions: (O-C; INTER; DEP; ANX; HOS; PAR; PSY;OI).

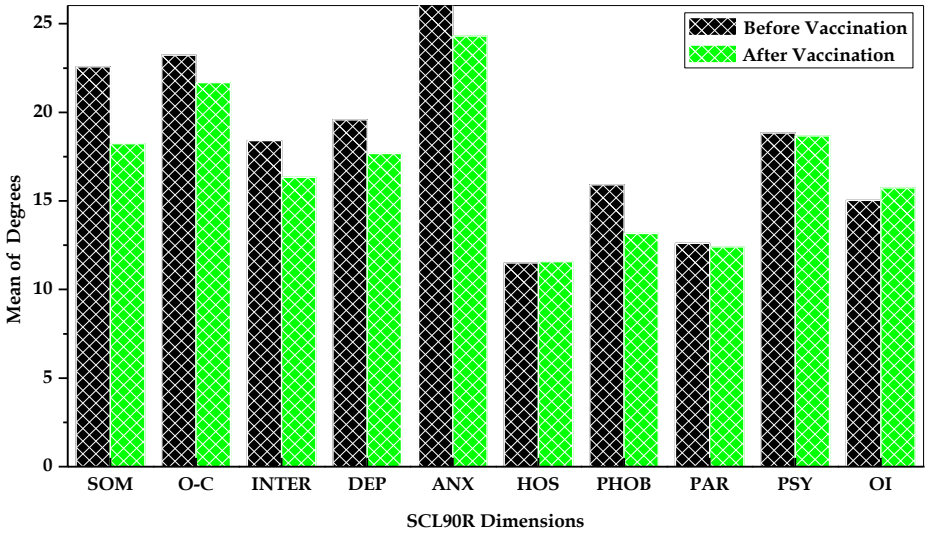
Fig 1.SCL 90-R scale dimensions before and after receiving the AstraZeneca vaccine



Source: Origin Pro 8 Program Outputs

While the results of the Sinovac vaccine indicated that there are statistically significant differences between the pre and post tests and in favor of the post-test (T= -2.173; P= ,038),which means an increase in the SCL 90-R levels of the group of athletes who received this vaccine, they reported symptoms of SOM after receiving the vaccine (T= -5,446; P=,000).The results after the vaccination also showed symptoms of ANX in the athletes (T= -1,755; P= ,040), and the athletes were also more prone to PHOB (T= -,757; P= ,035). No significant differences for the following psychological symptoms (O-C; INTER; DEP; HOS; PAR; PSY; OI).

Fig2. SCL 90-R scale dimensions before and after receiving the Sinovac

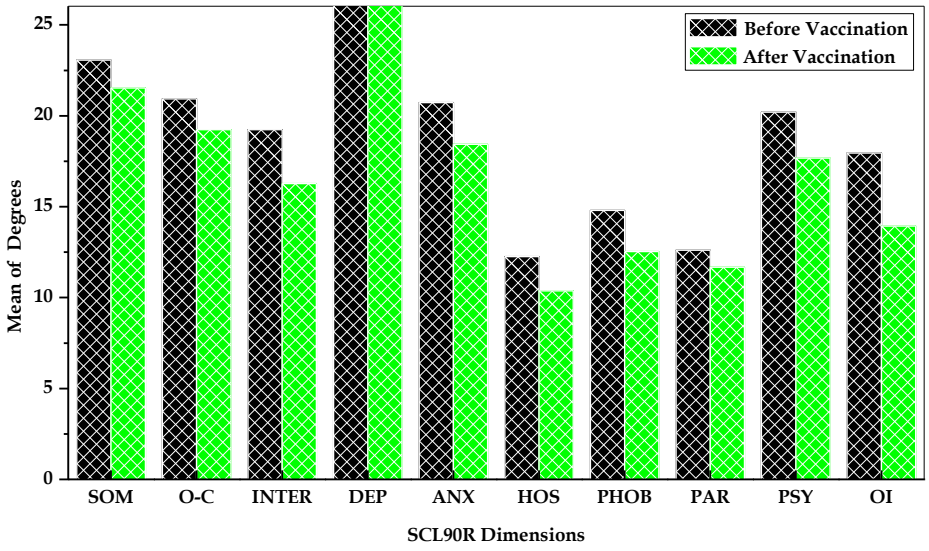


vaccine**.**

Source: Origin Pro 8 Program Outputs

As for the Sputnik-V vaccine, the results reported that there are statistically significant differences between the pre and post tests in favor of the post-test (T= -6.127; P= ,000). Therefore, SCL 90-R levels have a significant increase in the group of athletes who have made this type of vaccination. This group was exhausted from symptoms of SOM than usual after receiving this vaccine (T= -2,110; P= ,044). The results also indicate higher levels of INTER (T= -4,471; P= ,000), ANX (T= -2,963; P= ,006),PHOB (T= -2,821; P= ,009), as well as PSY (T= -3,494; P= ,002)compared to their mental health status prior to receiving this vaccine .Finally, no significant differences between groups for the remaining psychological dimensions.

Fig 3. SCL 90-R scale dimensions before and after receiving the Sputnik-V



vaccine.

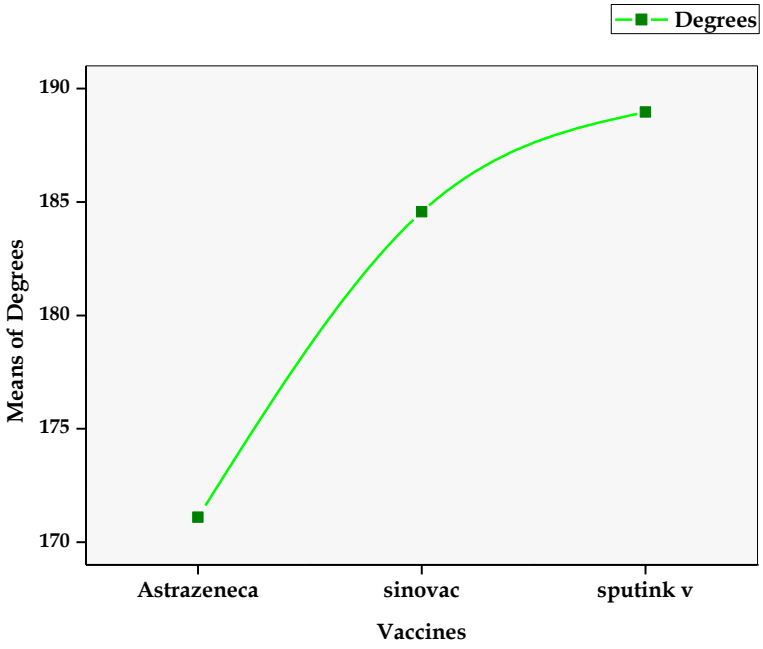
Source: Origin Pro 8 Program Outputs

In addition, the results proved that there were statistically significant differences between the three research groups (F= 5,572; P= ,005), this is what Tukey HSD Test shows in Table No 02.

(I) Groups	(J) Groups	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1,00	2,00	-13,46667*	5,57712	,046	-26,7652	-,1681
	3,00	-17,86667*	5,57712	,005	-31,1652	-4,5681
2,00	1,00	13,46667*	5,57712	,046	,1681	26,7652
	3,00	-4,40000	5,57712	,711	-17,6985	8,8985
3,00	1,00	17,86667*	5,57712	,005	4,5681	31,1652
	2,00	4,40000	5,57712	,711	-8,8985	17,6985

In summary, the Sputnik and Sinovac vaccines had a negative impact on mental health, as the Sputnik vaccine came first and then followed by the Sinovac vaccine; on the contrary, the AstraZeneca vaccine did not affect mental health.

Fig 4.Comparison of mental health levels among the three research groups after receiving vaccinations.



Source: Origin Pro 8 Program Outputs

4. DISCUSSION

Vaccination is a simple, safe and effective way to protect against diseases (Guiseppe Lippi, 2021), where it pushes the body to resist certain infections and strengthen the immune system by training it to produce antibodies (Da Silveira, 2021), in view of the rapid and easy spread of the COVID-19 and the infection of the majority of the world's population with it (Visitsak Nueangnong, 2020). The importance of this vaccine lies in protecting against the Corona virus by allowing the body to safely develop an immune response that provides protection for the body by preventing or controlling infection (Konstantin Chumakov, 2021). COVID-19 vaccines, like any other vaccines, can cause side effects, most of

which are mild or moderate and disappear on their own within a few days (Esther Río, 2022), these vaccines can also have more serious or long-term side effects that are very unusual (Osama Abu-Hammad, 2021). To the best of our knowledge, this study is the first one developed to assess the psychological impact of receiving different types of COVID-19 vaccines in Algeria. The results showed that the mental health was negatively affected after receiving both the Sinovac and Sputnik V vaccine, an increase in levels of symptoms SOM; ANX; PHOB for the Sinovac vaccine, and symptoms SOM; INTER; ANX; PHOB; PSY for the Sputnik-V vaccine, this result needs to be explained: in general, the very short time that was devoted to the production of these vaccines (Forni Guido, 2021), the lack of time to follow the appropriate instructions to complete clinical trials (Rana K Abu-Farha, 2020) and the short and long-term problems have made doubts about the efficacy and safety of these vaccines (Chih-Cheng Lai, 2021).

In particular, the Sinovac vaccine faces several concerns after large clinical trials in Brazil showed that two doses of the vaccine had an efficacy rate of only 50.4% against symptomatic COVID-19 infection, which is much lower than the previously promoted rate. Due to the small number of participants in clinical trials, data on the safety of the vaccine are limited for people over 60 years of age at present (Smriti, 2021). However, current data indicate that the Sinovac vaccine is likely to be safe and preventative for the elderly (Zhiwei Wu MSca, 2021).Many criticisms were also made to the studies of the Sputnik vaccine because of the great contradictions between them (Christoffer, 2021),not to mention the concerns raised in developing countries due to the spread of Human Immunodeficiency Virus (HIV) about vaccines based on the adenovirus serotype 5 (Ad5) vector that activates the dendritic T-cell axis and consequently high levels of HIV-1 reproduction in Cluster of Differentiation 4 (CD4) cells (Perreau Matthieu, 2008).Moreover, adenovirus serotype 26 (Ad26) immunity is prevalent, but the titers of the baseline Ad26 neutralizing antibody are not elevated and therefore do not inhibit Ad26-based vaccines (Makda S.Gebre, 2021).All these comments and criticisms are among the main reasons that led to the high levels of mental health among athletes, especially after receiving these vaccinations.

Unlike the AstraZeneca vaccine, this had no significant effect on mental health, except for the emergence of high levels of SOM -like other vaccines- and PHOB. AstraZeneca has been associated with pulmonary embolism and thrombosis, although these have been very rare events. However, the European Medicines Agency (EMA) Safety Committee confirmed that vaccination does not cause these cases (Mansour Tobaiqy, 2021), which was indicated by the official spokesperson of AstraZeneca that the Oxford–AstraZeneca vaccine is very safe and effective (Nawfal R.Hussein, 2022), and that its benefits greatly outweigh its risks (Pinho, 2021).

Interestingly, the three vaccines showed physical symptoms in athletes after vaccination, as COVID-19 vaccines, like any other vaccine, can cause side effects, most of which are mild or moderate and disappear on their own within a few days (Francisco Sánchez-Saez, 2022),Recent evidence indicates that after vaccination individuals suffer from muscle and joint pain, headaches (Abanoub Riad, 2021), fever, malaise accompanied by fever and chills (Sana Abbas, 2021), as well as very rare reactions such as severe allergic reactions, such as vomiting (Mi-Ae Kim, 2021), these vaccines can also have more serious or long-term side effects that are very unusual (Daniela Calina, 2020), COVID-19 disease itself sometimes causes myocarditis. For example, out of 1,597 college athletes who contracted corona infection, 37 of them had signs of myocarditis (Curt J. Daniels, 2021),cases of a rare neurological disorder called Guillain-Barre Syndrome (GBS) have also been reported about two weeks after receiving the vaccine (Shih-Chieh Shao, 2021).Rare cases of a blood clot known as Cerebral Venous Sinus Thrombosis (CVST) have been reported infect several individuals (Cesare de Gregorio, 2022). There have been reports of cases of thrombocytopenia syndrome, hypersensitivity and others, but it was to a lesser degree than the previous complications (Stoyanov A, 2021).

This study has several weaknesses. First, the study was limited to only one SCL90-R scale although it contained several different psychological symptoms, so it would have been better to use several different psychological scales in order to be more comprehensive. Second, our study did not include mRNA-based vaccines such as Pfizer-Biontech and Moderna vaccines. Third, it was advisable to compare the mental health of the athletes after receiving the first dose and the second dose due to the sensitivity of the subject.

However, this study has some strengths. In our study on the psychological impact of vaccines on athletes, this has enabled us to explore the importance of the psychological aspect as much as the physical aspect in the progress and success of these vaccines; we did not expect this in the preparation of the research. Furthermore, although there have been several studies on COVID-19 vaccines, this particular topic has not been addressed in relation to the mental health of athletes after receiving these vaccines.

Despite the large number of vaccine doses administered worldwide, little is known about their adverse events and the mechanism of triggering different patterns of adverse events. Therefore, the current results of this study made us concerned about the suspiciously high levels of mental health after receiving some vaccinations among Algerian athletes, with the possibility of this situation continuing to deteriorate, especially if no radical solutions are found for the vaccination protocol and a clear psycho-social program is established to follow up on the vaccinated after periods of receive the vaccine.

There are still many questions that have to be answered regarding the effect of vaccines on mental health in the short or long term and their relationship to the physical aspect of the athlete, and how to deal with the emergence of mental health problems. This problem still needs a lot of research and in depth investigation from different angles in order to reach accurate results that can be circulated.

5. CONCLUSION

In summary, receiving the Sinovac and Sputnik V vaccines adversely affects the mental health of Algerian athletes. As for AstraZeneca, it had no clear effect on mental health except for an increase in SOM symptoms. An increase in symptoms was also observed SOM; ANX; PHOB after receiving the Sinovac vaccine. In addition to elevated levels of symptoms of SOM; INTER; ANX; PHOB; PSY after receiving the Sputnik V vaccine.

In general, there is still an urgent need to conduct further studies on mental health after receiving the COVID-19 vaccines in order to take possible preventive measures and develop effective and rapid intervention strategies.

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