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VACCINE HESITANCY: ATTITUDE TOWARDS COVID-19 VACCINE AMONGST UNDERGRADUATE MEDICAL STUDENTS AT THE UNIVERSITY OF NAMIBIA.

Medicine

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ABSTRACT

Introduction: The World Health Organization (WHO) has recognized vaccine hesitancy as one of the top ten threats to global health. In addition, experts around the world have noted an increased propensity towards negative vaccination attitudes over the years. As medical students are future health care providers, it is important to identify their stance on vaccinations and to shape their attitudes in that regard. **Methods:** An anonymous 14-item online Google Forum questionnaire was administered to third to sixth year undergraduate medical students at UNAM. The study period ran from 04/09/21-23/09/21. **Results:** The study received 89 responses out of an anticipated 163. Majority of students (74%) were already vaccinated, 8% expressed a desire to get vaccinated and 18% were not intending to get vaccinated. The most common reason (69%) for vaccine hesitancy was uncertainty about vaccine safety and associated side effects. On the other hand, fear of contracting the virus and infecting friends/family and the belief that getting vaccinated is one way to reach an end to the pandemic were amongst the most important factors influencing pro-vaccination behaviours. Lastly, the study had no sufficient evidence to reject the null hypothesis: H0: Medical students are proCovid-19-vaccination. **Conclusion:** Amongst the study population, majority had already been vaccinated. The fear of contracting the virus and subsequently infecting loved ones was one the main factors responsible for this pro-vaccination attitudes. On the other hand, one of the major factors which contributed to hesitancy were concerns about vaccine safety and uncertainty about possible side effects. As a result, specific measures aimed at providing adequate evidence-based information regarding the safety and efficacy of the vaccine should be put in place.

KEYWORDS

COVID-19; vaccine hesitancy; vaccination attitudes; medical students

BACKGROUND:

Vaccine hesitancy is defined as a delay in accepting or refusal of vaccination despite the availability of vaccination services (Macdonal, N. E., 2015). This ultimately poses a risk not only to the vaccine hesitant individual but to the community as a whole. Worldwide there have been growing concerns regarding the safety and efficacy of Covid-19 vaccines. This is due to factors which pertain to inadequate data on its safety and efficacy; rushed vaccine development and emergency use authorization for its use. Others include, misinformation and conspiracy theories about Covid-19 in general. (Sallam, M. et al, 2021).

Some studies on the attitudes and behaviours towards the Covid-19 vaccine, have been conducted in countries such as Egypt, India, Poland and the United states with varying results. However, there is no data on vaccine acceptance rates in Namibia as a whole. As a result, this study sought to assess the attitude of undergraduate medical students in the University of Namibia towards the Covid-19 vaccine. Also the study aimed to assess the factors that influence pro-vaccination and vaccine hesitancy behaviours amongst undergraduate medical students at the University of Namibia.

Literature Review

Szmyd B. et al (2021), assessed the attitudes and behaviours towards Covid-19 vaccines amongst 1,971 students comprising of 687 medical students and 1,284 non-medical students. Amongst the medical students, the authors observed that 91.99% were pro-vaccine. Some of the factors which influenced their pro-vaccination behaviours included: 1) fear of contracting the virus and associated deterioration in health 2) fear of infecting loved ones 3) post-Covid syndrome and 4) social stigma. Another factor which has been reported to play a role was the location of vaccine development; with more people expressing a greater degree of acceptance with vaccines developed in the US followed by Europe (Pogue K. et al 2020).

Furthermore, some studies have noted a positive correlation between prior vaccination against influenza and pro-vaccination behaviours towards Covid-19 vaccines (Petravic L. et al, 2020). In this study, the authors also reported that participants who had friends or family members who were hospitalized or who had died of Covid-19 were more pro-Covid-19 vaccination. (66%) in comparison to those who did not share a similar experience (53%). Lin, C., et al. (2021) also noted that Ethnicity played a significant role in individuals' attitude towards vaccination. To elaborate this fact, they found that white Americans expressed higher pro-vaccination attitudes as compared to African Americans. In addition, Malik, A. A et al (2020) reported that African Americans were 40% less likely to accept the Covid-19 vaccine in comparison to the white Americans due to lack of trust in the safety and efficacy of the vaccine.

Lucia V. C and colleagues (2020) conducted a study to assess Covid-19 vaccine hesitancy amongst medical students in the US. They found that though majority of the students had positive attitudes towards vaccines, only 53% reported a willingness to receive the vaccine. The researchers employed the use of an anonymous online survey and also incorporated factors such as: 1) previous vaccination behaviours 2) attitude towards vaccines 3) knowledge about Covid-19 and 4) individual risk perception of contracting the virus. Furthermore, in India, a cross-sectional study was conducted amongst 962 medical students and reported that only 10.6 % of students were hesitant to get the vaccine (Jain, J. et al, 2021). Similar to the study conducted by Lucia et al (2020), concerns about both the short and long term adverse effects as well as doubts about vaccine efficacy were predictors for vaccine hesitancy amongst students.

On the other hand, Egypt reported one of the highest rates of vaccine hesitancy amongst medical students comprising of 45.7%. Among the students interviewed, 19.4% expressed down-right refusal to get the vaccine (Saied, S.M. et al, 2020). One major factor which contributed to vaccine hesitance among these students was the short period of time spent on clinical testing of the vaccine. To buttress this point, a study reported that 66.05% of their participants were willing to get vaccinated if a vaccine were available within 30 days. However, this number increased to 74.38% when the hypothetical time span was increased to six months. This has given credence to the fact that people were more willing to receive Covid-19 vaccine if it had undergone more vigorous clinical testing (Pogue K. et al 2020). Verger et al (2020) also reported "safety of a vaccine developed in an emergency" as the most important factor associated with vaccine hesitancy amongst their study participants.

Looking at the working-age (18-64 years) population in France, Schwarzinger et al (2021) found that 28.8% out rightly refused vaccination against Covid-19. In addition, the authors noted that there was a strong association between negative attitudes towards Covid-19 vaccination and certain factors. These factors include: 1) Female gender 2) lower level of education 3) prior history of poor vaccination compliance. The link between female gender and vaccine hesitancy has been reported by a number of other studies, however, the reason behind this association remains unclear. Contrary to the French study,

another study conducted in Australia reported vaccine hesitancy rates of 14.4% and attributed the positive vaccination attitudes to a greater level of confidence in the Australian government (Dodd, R. H et al, 2020).

Methodology

Research Design And Setting

This study was conducted amongst third to sixth year undergraduate medical students of the University of Namibia (UNAM). A quantitative research design was employed in order to identify the percentage of students who were pro-Covid-19 vaccination and those who were against it. The research design also helped to run statistical tests such as Chi Square on the data collected in order to accept or refute the null hypothesis.

Sample Size And Sampling Method

Sample size determination was based on an estimate of approximately 70 students per class (x 4 classes = 280 students). With the aid of the Survey Monkey sample size calculator (CI = 95%; margin of error = 5%), the sample size was calculated to be 163; thus, equating to 41 medical students per class. Furthermore, nonprobability voluntary response sampling was employed. This allowed any student in third-sixth year who had access to the link and internet connection to respond to the questionnaire. Failure to consent to participate in the study was the only exclusion criteria.

Data Collection Tools And Procedure

All undergraduate medical students from third to sixth year were invited to participate in the study. A Google Form link to an anonymous questionnaire (see appendix III) was sent to the class representatives of the respective years of study. The class representatives were requested to share the link on the class Whatsapp groups. Before potential participants commenced with the questionnaire, they were provided with relevant information regarding the study, such as the purpose of the study, data handling (i.e data storage, insurance of anonymity), risks and benefits, as well as the right to refuse to partake in the study. Thereafter, participants were required to provide informed consent, digitally. The questionnaire included information such as year of study, gender, history of previous influenza vaccinations, stance on Covid-19 vaccination, reasons for wanting/rejecting the vaccine, as well as previous Covid-19 infection in participants themselves or loved ones.

Data Analysis

The data collected on Google Forms was extracted from the forum to an Excel sheet and verified for completeness. Data was transferred and coded onto SPSS. SPSS was used to generate bar graphs and pie charts, as well as to run tests such as Chi-square to test the hypothesis. A level of 5% was used as a significance threshold for all results unless stated otherwise.

Ethical Considerations

Potential participants were provided with all the relevant information (purpose of the study, right to refuse to participate/withdraw at any time, potential risks etc) in order for them to make an informed decision about whether they wish to participate or not. Furthermore, appropriate measures (e.g questionnaire anonymity) were taken to ensure confidentiality.

RESULTS

The study revealed, that there were more female respondents (73%) than males (27%), a ratio of 2.7:1. In addition, majority of the participants were sixth year students (40%) followed by those in their third year (25%), and fourth year (18%). The least group of the participants came from those in their fifth year (17%). Results from the study showed that each category had at least 15% of the participants and the presence of participants in each category was helpful in this study as it ensured a more diverse response set to the questions of the study. (Fig 1)

In regard to previous vaccination against influenza, we found that slightly above 50% of the participants had been vaccinated, while 44% had not. The study also revealed that few of the participants had tested positive for Covid-19 (35%). However, 91% of the students have had relatives or friends who had tested positive for Covid-19. The low rate of positive Covid-19 result among our participants could be attributed to the fact that they adhered to the health measures such as regular handing sanitization and social distancing. (Table 1)

Findings from the study also revealed that most of the participants were already vaccinated (74%). Majority of the pro-vaccine participants were in their sixth year of study (31 of the 89) while few of them were in the fifth year. Most of the vaccine hesitant participants were third year (6 out of 89) and fifth year (5 out of 89). (Fig 2 and Table 2)

Table 3 showed factors that influenced pro-vaccination attitudes of our participants. The most dominating factors were; fear of contracting the virus and infecting friends/family (27 %) and the belief that it's one of the ways to reach an end to the pandemic (27 %). Other factors included ill health as a result of the virus and peer pressure.

Concerning factors that influenced vaccine hesitancy among our study population, we found that 69% participants had concerns about the safety of the vaccines and the likely side effects. Very few of the participants were concerned about the fact that there was insufficient time spent on clinical testing for the vaccines (10%). Other factors include concerns on efficacy (6%), long term effects (6%) and inadequate personal knowledge about Covid-19 and the different vaccines (6%). (Table 4)

On statistical analysis using chi-square test conducted, we found that medical students are pro- Covid-19 –vaccination with p-value of 0.005. (Table 5). However, the study revealed that previous influenza vaccination had no influence of acceptance of Covid-19 vaccine. (p-value 0.529). Table 6

DISCUSSION

To the best of our knowledge, this was one of the first studies in Namibia to explore the attitudes and factors which influence attitudes towards Covid-19 vaccinations amongst medical students. This study found that 26% of our study participants belong to the vaccine hesitant group. This is lower that the value of 46% reported by Saied et al. (2021), amongst a group of Egyptian medical students. Polish medical students had significantly higher acceptance rates (91.99%) (Szmyd, B. et al, 2021). In addition, a significant high number of our participants had already been vaccinated against Covid-19. This finding may be due to the fact that majority of our participants had a relative who was Covid-19 positive as at the time of conducting the study. This may have contributed to a higher percentage being pro-vaccination. This observation is similar to the finding of other studies by Saied et al (2021), as well as Szmyd, et al (2021).

Furthermore, the present study revealed that the fear of contracting Covid-19 was one of the major factors which influenced the pro-vaccination behavior of our respondents. In the same vein, Szmyd, et al (2021) in their study observed that the willingness to get vaccinated as soon as possible was significantly amplified by fear of contracting the virus and passing it on the to relatives. One other factor which influenced vaccine acceptance in our study was the belief that mass vaccination was one of the ways to an end the Covid-19 pandemic. Other factors such as compulsory vaccination for health care professional and peer pressure ranked lower on the list of factors which influenced pro-vaccination attitudes.

In this index study, the concern about safety of Covid-19 vaccines followed by insufficient time spent on clinical testing contributed significantly to vaccine hesitance among our participants. Some other factors include concerns about efficacy, long-term effects of the vaccine and inadequate personal knowledge about Covid-19. A similar study by, Lucia et al (2020) showed that concerns about vaccine side effects and lack of trusted information were amongst the notable factors which influenced hesitancy amongst a group of medical students in Southeast Michigan.

Study Limitations

One notable limitation of this study is the fact that, it employed the use of an online questionnaire thus only rendering it accessible to those with internet connection during the study period.

Furthermore, the intended sample size was 160 participants, only 89 students fully participated in the study. This was due to poor response rates, especially amongst the fourth and fifth year students.

Conclusion And Recommendations

This was the first study of vaccine hesitancy conducted amongst undergraduate medical students in our country. Amongst the study population, majority had already been vaccinated. The fear of

contracting the virus and subsequently infecting loved ones was one the main factors responsible for this pro-vaccination attitudes.

On the other hand, one of the major factors which contributed to hesitancy were concerns about vaccine safety and uncertainty about possible side effects. As a result, specific measures aimed at providing adequate evidence-based information regarding the safety and efficacy of the vaccine should be put in place.

Tables And Figures:

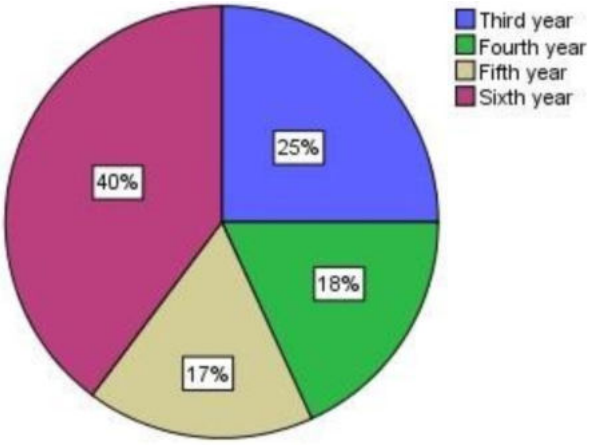


Figure 1: Participant's Year Of Study.

Table 1: Participants Personal & Family/Relative Prior Vaccination And Infection Status

	No	Yes
Have you ever gotten an annual Influenza vaccine (Flu shot)?	56%	44%
Have you ever tested positive for Covid-19?	65%	35%
Has a close relative or friend of yours ever tested positive for Covid-19?	9%	91%

Table 1 illustrates a distribution of participants' responses in line with prior vaccination and infection status, both personal as well as that of their family/friends.

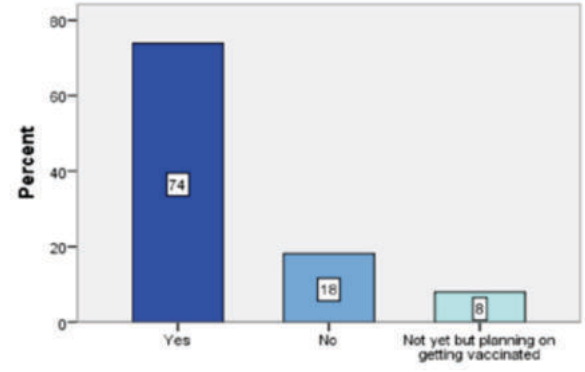


Figure 2: Pro-vaccine And Against Vaccination

Shows a distribution of participant's responses in regard to current vaccination status.

Table 3: Breakdown Of Vaccination Percentages

Have you been vaccinated against Covid - 19?	No	Yes	Not yet	Total
Third year	6	13	3	22
Fourth year	2	13	1	16
Fifth year	5	8	2	15
Sixth year	3	11	35	48
Total	16	45	41	88

Table 3: Factors Influencing Pro-vaccination Attitudes

	Responses	
	N	Percent
Fear of contracting the virus + associated affects it'll have on my health	44	22%
Fear of contracting the virus and infecting friends/family	54	27%
I believe it's one of the ways to reach an end to the pandemic	54	27%
I feel it's compulsory for me to get the vaccine because I work in the health-care sector	40	20%
Peer pressure	7	4%
Total	199	100%

Table 3 Shows A Distribution Of The Factors Influencing Pro-vaccination Attitudes.

Table 4: Factors Influencing Vaccine Hesitancy

Responses	N	Percent
Concerns about safety (uncertainty about side effects etc)	34	69%
Concerns about efficacy	3	6%
Conspiracy theories (e.g the vaccine is a means to implant microchips)	1	2%
Insufficient time spent on clinical testing an emergency approval of certain Vaccines	5	10%
Concerns about long term effects of the vaccine	3	6%
Inadequate personal knowledge about Covid-19 and the different vaccines	3	6%
Total	49	100%

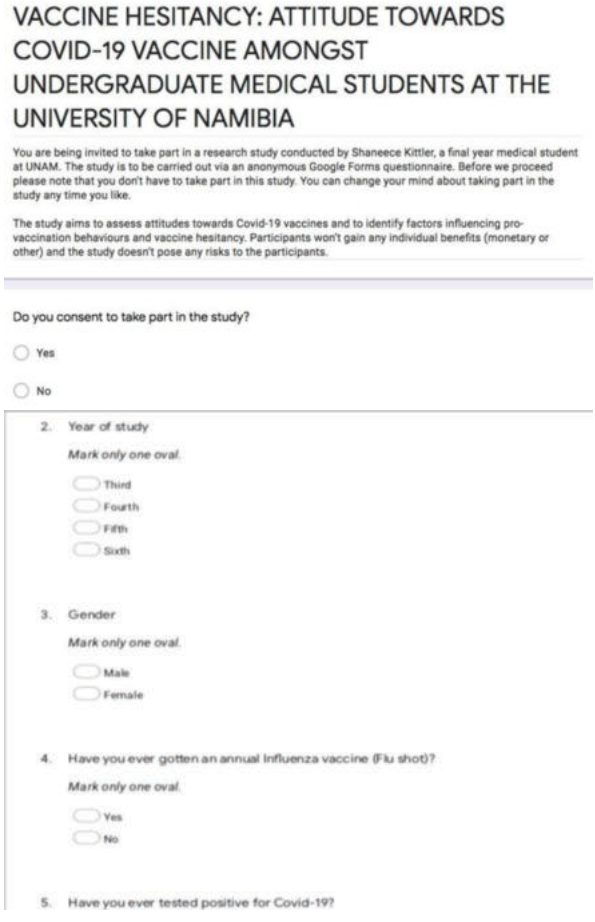
Table 5: Chi-square Results

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.452	2	.005
Likelihood Ratio	10.567	2	.005
Linear-by-Linear Association	9.405	1	.002
N of Valid Cases 88			

Table 6: Association Between Prior Influenza Vaccination And Current Covid-19 Vaccination Status

Have you been vaccinated against Covid-19?	Pearson Chi- Square
Have you ever gotten an annual influenza vaccine	.529

Appendix B: Consent + Questionnaire



VACCINE HESITANCY: ATTITUDE TOWARDS COVID-19 VACCINE AMONGST UNDERGRADUATE MEDICAL STUDENTS AT THE UNIVERSITY OF NAMIBIA

You are being invited to take part in a research study conducted by Shaneece Kittler, a final year medical student at UNAM. The study is to be carried out via an anonymous Google Forms questionnaire. Before we proceed please note that you don't have to take part in this study. You can change your mind about taking part in the study any time you like.

The study aims to assess attitudes towards Covid-19 vaccines and to identify factors influencing pro-vaccination behaviours and vaccine hesitancy. Participants won't gain any individual benefits (monetary or other) and the study doesn't pose any risks to the participants.

Do you consent to take part in the study?

- Yes
- No

2. Year of study

Mark only one oval.

- Third
- Fourth
- Fifth
- Sixth

3. Gender

Mark only one oval.

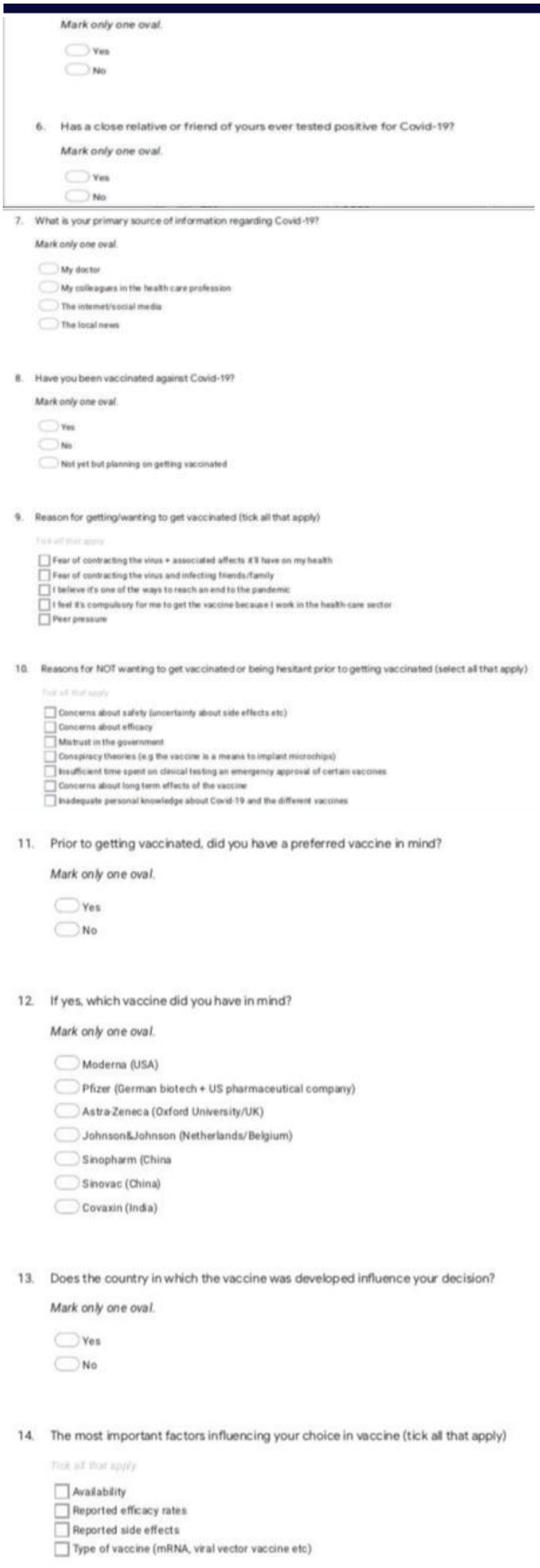
- Male
- Female

4. Have you ever gotten an annual Influenza vaccine (Flu shot)?

Mark only one oval.

- Yes
- No

5. Have you ever tested positive for Covid-19?


Mark only one oval.

Yes
No

6. Has a close relative or friend of yours ever tested positive for Covid-19?

Mark only one oval.

Yes
No

7. What is your primary source of information regarding Covid-19?

Mark only one oval.

My doctor
My colleagues in the health care profession
The internet/social media
The local news

8. Have you been vaccinated against Covid-19?

Mark only one oval.

Yes
No
Not yet but planning on getting vaccinated

9. Reason for getting/wanting to get vaccinated (tick all that apply)

Tick all that apply.

Fear of contracting the virus + associated affects it'll have on my health
Fear of contracting the virus and infecting friends/family
I believe it's one of the ways to reach an end to the pandemic
I feel it's compulsory for me to get the vaccine because I work in the health-care sector
Peer pressure

10. Reasons for NOT wanting to get vaccinated or being hesitant prior to getting vaccinated (select all that apply)

Tick all that apply.

Concerns about safety (uncertainty about side effects etc)
Concerns about efficacy
Mistrust in the government
Conspiracy theories (e.g the vaccine is a means to implant microchips)
Insufficient time spent on clinical testing an emergency approval of certain vaccines
Concerns about long term effects of the vaccine
Inadequate personal knowledge about Covid-19 and the different vaccines

11. Prior to getting vaccinated, did you have a preferred vaccine in mind?

Mark only one oval.

Yes
No

12. If yes, which vaccine did you have in mind?

Mark only one oval.

Moderna (USA)
Pfizer (German biotech + US pharmaceutical company)
Astra-Zeneca (Oxford University/UK)
Johnson&Johnson (Netherlands/Belgium)
Sinopharm (China
Sinovac (China)
Covaxin (India)

13. Does the country in which the vaccine was developed influence your decision?

Mark only one oval.

Yes
No

14. The most important factors influencing your choice in vaccine (tick all that apply)

Tick all that apply.

Availability
Reported efficacy rates
Reported side effects
Type of vaccine (mRNA, viral vector vaccine etc)

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