COVID-19 VACCINATION EXPERIENCES OF PEOPLE RECEIVING COVID-19 VACCINES AT HANOI MEDICAL UNIVERSITY AND RELATED FACTORS

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ABSTRACT

Objective: The study described the post-injection symptoms, experience after being vaccinated against COVID-19 and some related factors of people vaccinated at Hanoi Medical university. **Method:** We conducted a mixed-method cross sectional study, combining qualitative and quantitative approaches on adults who received the second dose of vaccine at Hanoi Medical University from August 2021 to June 2022.With the quantitative part collected by online questionnaires and analyzed using descriptive statistics by the Stata 15.0 software. For the qualitative part, we used the content analysis strategy of in-depth interviews. **Results:** 696 people participated in the study and the majority of those experienced post-vaccination symptoms (88.5%), followed by tiredness, fever and the increased pain at the injection site. Most respondents felt satisfied with the vaccination process (98.4%). The in-depth interviews showed 5 feelings during the injection, including anxiety, suspense, fear, non-anxiety, and satisfaction. Negative experiences were mainly related to post-injection side effects and most common at the first dose of vaccine. Common related factors included: individual factors; family and friends; vaccines; injection environment; reference sources and other social factors. The vaccine factor was reported to have the most impact on vaccination experience. **Recommendations:** Enhance professionalism according to the vaccination organization process as well as improve the efficiency of pre-, during and post-injection consultations of medical vaccination facilities in the locality. At the same time, regularly update and ensure the quality of information sources, especially vaccination information on the electronic system for easy access by injectors and agencies and organizations.

Keywords: *COVID-19, Immunization, Vaccination needs, Cross-sectional study, Immunization experience.*

I. INTRODUCTION

Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus. The development of a COVID-19 vaccine was a crucial strategy that was prioritized and pushed forward efforts to mitigate the impact of the pandemic on international development. As of May 11, 2023, Vietnam had deployed expanded immunization with more than 266 million doses of COVID-19 vaccine (5). A study of Asres at a university involving more than 300 students aimed to assess awareness, attitudes, and acceptance regarding COVID-19 vaccines and to assess the reasons for vaccine rejection of students. This study showed that only 41% of students have a good understanding of COVID-19 vaccines, and 224 (57.9%) have a positive attitude toward COVID-19 vaccines (1). A study of 3119 residents in China willing to receive an

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additional dose of the COVID-19 vaccine, accounting for a total of 93,7% (6). An additional dose of vaccination is recommended to be a considerable supplementary intervention. In Vietnam, information about people's experience of getting vaccinated against COVID-19 remains scarce. Therefore, we conducted this study to Describe the post-injection symptoms and experience after being vaccinated against COVID-19 vaccines and Identify some factors related to the vaccination experience of people vaccinated at a university setting.

II. METHODS

1. Research design: a mixed-method cross sectional study, combining qualitative and quantitative approaches

2. Time and place of the study: This study started from August 2021 to June 2022 at Hanoi Medical University Hospital. The data collection duration was from August to September 2021.

3. Research participants

Adults have been vaccinated against COVID-19 at Hanoi Medical University Hospital; and agreed to participate in the study.

4. Sampling method

- ***Quantitative research***: We conduct convenient sampling. To describe the post-injection symptoms, we selected adults who received a second dose of COVID-19 vaccines (AstraZeneca, Pfizer, Moderna). . A total of 696 people participated in the research.

- ***Qualitative research***: We conduct purposeful sampling. For vaccination experiences, we conducted in-depth interviews with 40 respondents (20 men, 20 women).

5. Variables

- **Objectives 1:** the post-injection symptoms and experience
  - COVID-19 vaccination factors
  - Post-injection symptoms
  - Satisfaction factor in injection
  - Experience before, during and after vaccination
- **Objectives 2:** some factors related to the vaccination experience
  - Personal factors
  - Family and friend elements
  - Vaccine elements
  - Reference information source
  - Other social factors

6. Data instruments and collection

REDCap is used to build an online survey questionnaire. At the end of the survey, we asked for the subject approval to have them in our in-depth interview. If a subject agrees, we will collect their contacts for further interview arrangements. They can change their mind at any time throughout our research. However, no one refused to participate in the study afterwards.

When the amount of information was enough, we ended our interview process. We had trained researchers in our team to conduct the interviews.

7. Data management and analysis

Quantitative data were extracted from REDCap and cleansed using Excel then transferred to STATA 15.0 software for further analysis. With qualitative information, the researchers used content analysis strategy of in-depth interviews, analyzed and synthesized into topics and then making comments and accompanying typical citations.

8. Research Ethics

The research protocol was approved according to Decision No. 780/QD-ĐHYHN dated April 8, 2022. Participants were provided with information about the study and voluntarily participated in the study. The subjects could refuse to participate at any time during the study. Information provided by participants was confidential and used for research purposes only.

III. RESULTS

1. The general characteristics of the participants

Table 1 illustrates the demographic characteristics of 696 participants. In this study, the number of participants who received Moderna vaccination was the largest with 205 people. In terms of occupation, both healthcare workers and medical students got the most AstraZeneca vaccination with 66 and 38 people. Officers and businessmen were injected with Pfizer the most with 107 and 60 participants. Other people received Moderna the most, 77 people. Almost all participants did not have allergies and chronic diseases. The median of participants' age was 34, which varies from 27.0 to 34.4.

Table 1: **Demographic characteristics**

	Total (n= 696)	**AstraZeneca (n =196)**	**Pfizer (n=295)**	**Moderna (n=205)**
	n (%)	n (%)	n (%)	n (%)
Gender				
Male	316 (45.4%)	89 (45.4%)	128 (48.3%)	99 (48.3%)
Female	380 (54.6%)	107 (54.6%)	167 (56.6%)	106 (51.7%)
Occupation				
Healthcare workers	171 (24.6%)	66 (33.7%)	82 (27.8%)	23 (11.22%)
Medical students	40 (5.8%)	38 (19.4%)	1 (0.34%)	1 (0.49%)
Officers	232 (33.3%)	64 (32.7%)	107 (36.3%)	61 (29.8%)
Business/ Service	110 (15.8%)	7 (3.6%)	60 (20.3%)	43 (20.9%)
Others	143 (20.6%)	21 (10.7%)	45 (15.3%)	77 (37.6%)
BMI				
<18,5	53 (7.6%)	19 (6.4%)	19 (6.4%)	15 (7.3%)
18,5-24,9	522 (75%)	140 (71.4%)	222 (75.3%)	160 (78.1%)
>24,9	121 (17.4%)	37 (18.9%)	54 (18.3%)	30 (17.4%)
Allergy				
Yes	61 (8.8%)	15 (7.7%)	23 (7.8%)	23 (11.2%)
No	635 (91.2%)	181 (92.4%)	272 (92.9%)	182 (88.8%)
Chronic disease				
Yes	43 (6.2%)	7 (3.6%)	19 (6.4%)	17 (8.3%)
No	653 (93.8%)	189 (96.4%)	276 (93.6%)	188 (91.7%)
	Median (Q1 – Q3)			
Age	34 (27.0-34.4)	34 (24.5-40.5)	35 (29.0-40.0)	33 (26.0-41.0)

2. Post-vaccination symptoms

Figure 1 shows some post-vaccination symptoms of COVID-19 vaccines: AstraZeneca, Pfizer, Moderna. After injection, the number of participants experienced symptoms was higher than people with no symptoms with 616 participants (88.5%). The most common symptoms are at the injection site, with a proportion of 76.7%, followed by tiredness, fever, and increased pain. Participants who had Moderna vaccination experienced the highest number of symptoms including fever (75.1%), tiredness (78.1%), at the injection site (83.4%), and increased pain (68.8%).

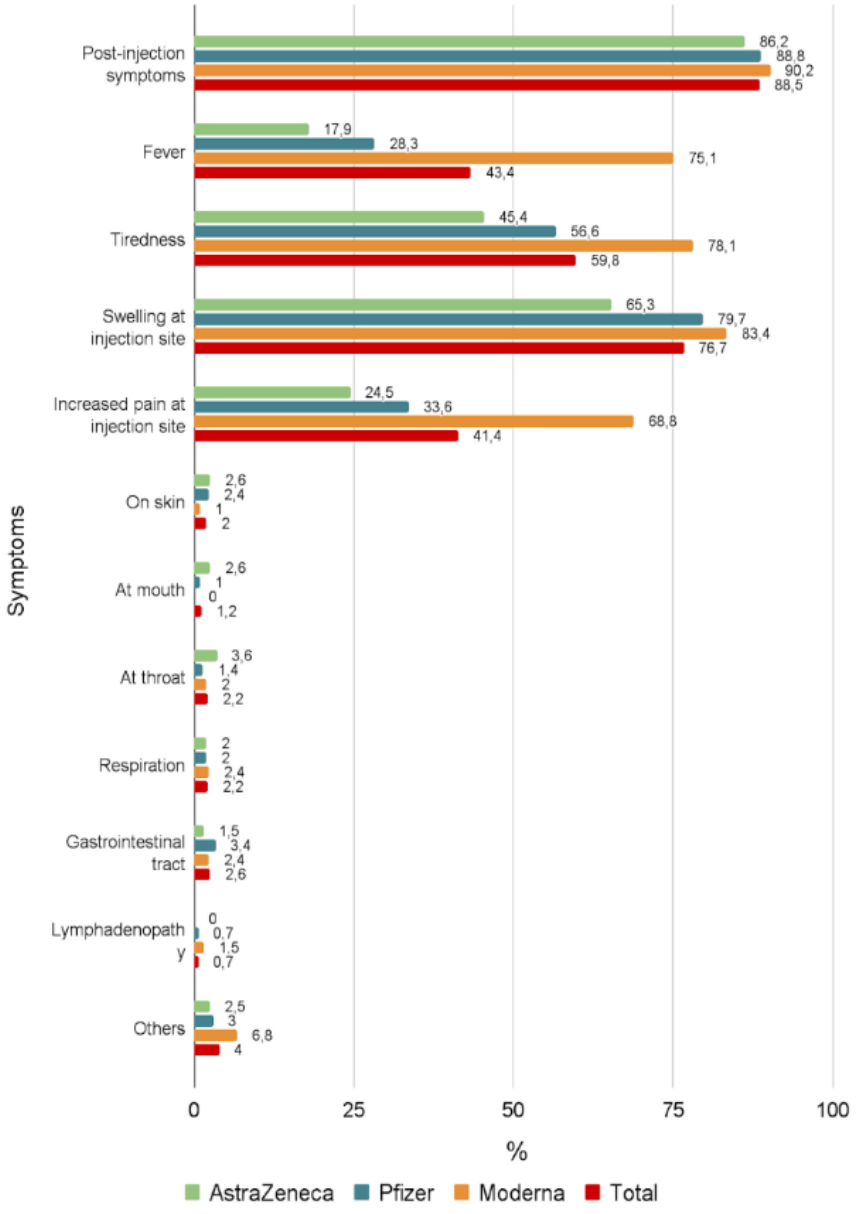

Figure 1. **Some post-vaccination symptoms among people receiving AstraZeneca, Pfizer-BioNTech and Moderna COVID-19 vaccines**

3. Experiences before, during and after vaccination

Most respondents felt satisfied with their vaccinations (98.4%) and if the 4th dose injection was implemented, 81.1% of the participants would agree to receive it. Pfizer was the most preferred vaccine (62.6%) because some subjects presumed that there were few unwanted effects after injection (51.2%).

Participants had some experiences throughout the process of injections such as anxiety, suspense, fear, non-anxiety, and satisfaction. These experiences varied with the number of injections. Feelings of fear, anxiety, and suspense tended to subside after each dose. The feeling of non-anxiety tended to increase in the 2nd dose and decrease gradually in the 3rd dose. There were no records of suspense in the 2nd dose.

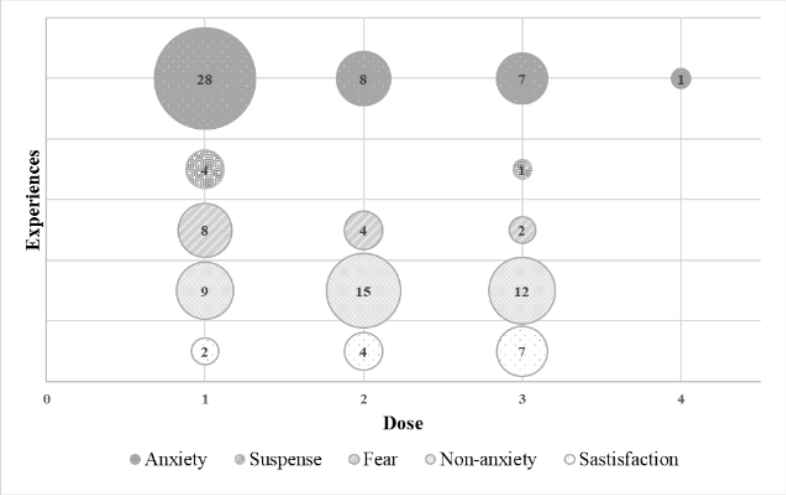

Figure 2. **Experiences through injections**

Table 2. **Excerpts of participants reflecting their experiences towards COVID-19 vaccination**

Experiences	Quotes	No
Anxiety	*"I was nervous because there were a few cases of anaphylaxis which led to eventual death."*	1
	"Instead of 30 minutes, I had to sit there for an hour, to make sure that I was good to go."	2
	"If I have to use another vaccine such as Pfizer, I will feel unsafe because I don't know about it yet"	3
Non-anxiety	*"My parents had some side effects after the 1st injection, so I knew how to handle them and I thought there was nothing to worry about."*	4
	"I didn't worry because the first time I went for the injection, I didn't get too tired like everyone said."	5
	"With the pandemic situation in Hanoi, I honestly had a more optimistic mindset after I had contracted Covid-19"	6
Suspense	*"The feeling was a bit suspenseful because this was the first time I was injected with this vaccine and it wasn't too common at that time"*	7
	"Being suspenseful because of trying a new kind of vaccine."	8
Fear	*"I was still afraid that it would have a reaction like the 1st shot, that my*	9

Experiences	Quotes	No
	hand would hurt."	
	"Pushing the 2nd injection to about one and a half months, while the recommendation was three months, at that time it was a bit afraid of anaphylaxis and the low effectiveness after that injection"	10
	"I was afraid that the effectiveness of the vaccine would not be high, so I decided to give it a shot."	11
Satisfaction	*"I was quite happy because I was vaccinated during the pandemic"*	12
	"I felt quite comfortable because the first shot was Astra, it was suitable for the second shot to be also Astra"	13

Before the first dose, respondents were extremely nervous. Most were worried about side effects such as post-injection anaphylaxis, allergy, and death *(quote 1)*. Meanwhile, a few showed no anxiety during the injections because they had consulted experienced people or testimonials on social networks *(quote 4)*. The anxiety highly depends on the 1st injection. In the case of C, who went to the emergency room for anaphylaxis after the first injection, decided to extend the waiting time *(quote 2)*. Especially in the 2nd dose and 3rd dose, the anxiety was mostly related to the combination of vaccines and many participants disagreed with the combination of two different vaccines *(quote 3)*. In contrast, after three doses of injection, some respondents were not anxious anymore and felt optimistic about the pandemic situation *(quote 5-6)*.

The suspense of getting vaccinated for the first time was also an experience mentioned by most respondents. They had this feeling due to being injected with a new vaccine *(quote 7)*. This feeling was not noted during the second injection because of the previous injection experience. However, it was again recognized in the 3rd dose because of the combination of vaccines *(quote 8)*.

The feeling of fear in the first injection was due to side effects after the injection and was continued to be reported in the 2nd dose *(quote 9)*. In the 2nd dose, there was an additional feeling of fear because the interval between the 2 doses was shortened compared to the recommended one *(quote 10)*. By the 3rd injection, the feeling of fear was due to the prolonged interval between the two injections, hence some people were apprehensive about the effectiveness of the vaccine *(quote 11)*.

Besides, some participants said they felt satisfied with the quality of vaccines as well as vaccination services. The satisfaction in the first dose mainly came from being injected at the right time and continued to be reported in next injections because they received the same vaccine and did not experience any side effects after the injection *(quote 12-13)*.

4. Factors affecting vaccination experiences

Our findings show that factors related to vaccination experiences included: individual factors; family and friends; vaccines; injecting environment; references and other social factors.

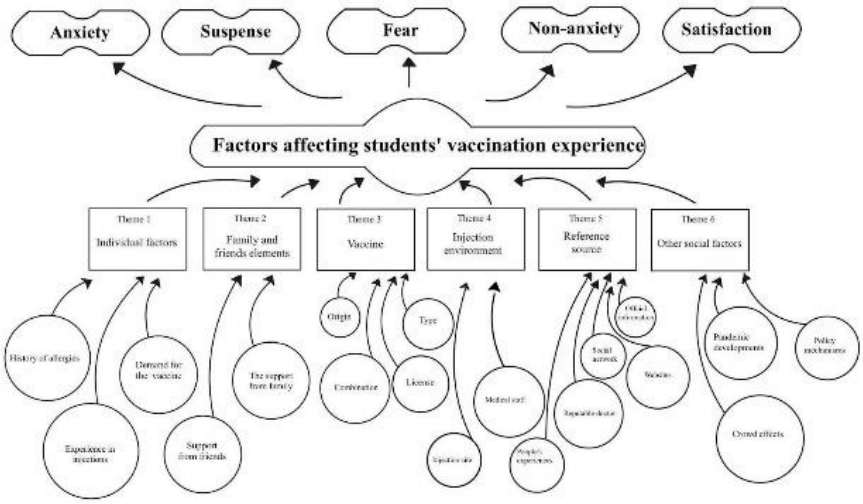

Figure 2. **Some factors related to vaccination experience**

Table 3. **Excerpts of participants reflecting associated determinants**

Themes and sub-themes	Quotes	No
Theme 1: Individual factors		
History of allergies	*"I felt anxious because my body was also quite susceptible to allergies."*	14
Experience in injections	*"I felt more comfortable because I had been through once, so I had more experiences and felt more comfortable"*	15
Demand for the vaccine	*"I also felt very happy with myself being vaccinated with the type of vaccine that I had wanted"*	16
	"It was a bit disappointing, but I still decided to take it"	17
Theme 2: Family and friends elements		
Support from family	*"Because my parents drove me there, I didn't feel too worried anymore."*	18
Support from friends	*"I went to the injection site with my friends that day. We talked and had a good time, so there was no problem."*	19
Theme 3: Vaccine		
Type	*"As far as I could see, Pfizer had positive feedback and data on effectiveness."*	20
	"I was quite comfortable when I was injected with AstraZeneca again in the 2nd dose, it would be the best to double my immune system. "	21
Origin	*"I didn't believe in Vietnamese and Chinese products very much. But if it's foreign brand, anything is fine"*	22
License	*"I felt that it must get a certain standard to get a license like that, so I believed in it's effectiveness"*	23
Combination	*"I wasn't in favor of mixing because when mixing, there were a lot of cases which were shocking."*	24

Themes and sub-themes	Quotes	No
Theme 4: Injection environment		
Injection site	*"Waiting at the Hanoi Medical University didn't have to wait long, and the nurse encouraged me to feel secure because of the modern machinery and highly specialized doctor. Well, to be honest, I was kind of reassured..."*	25
Medical staff	*"There was a precaution about shock after injection and people also monitor the post-injection process, I was not too worried about this issue"*	26
Theme 5: Reference source		
Official information	*"If it is news from the Ministry of Health, I will believe it"*	27
Websites	*"There were a number of websites that were quite reassuring, for example from the Ministry of Health or from the WHO."*	28
Social Network	*"I often read articles on Facebook, and to be honest, when I saw some recommendations of the Ministry of Health, I usually skipped them."*	29
Reputable doctors	*"I liked the personal pages of some teachers in my university. I felt that I could trust them because the amount of information about vaccines and viruses was still limited at that time, so their source of information was the official approach."*	30
People's experiences	*"My friend was also quite sick, which seemed like 1st degree shock, so she had to go to the emergency room. That made me feel a bit worried."*	31
Theme 6: Other social factors		
Pandemic developments	*"Because the outbreak was quite strong, I was like many others, getting injections with the aim of safety."*	32
Policy mechanisms	*"I wanted to get the 3rd dose as soon as possible because it was necessary to move between localities at that time."*	33
Crowd effects	*"I decided to get it although I don't think it's necessary, but there were many people in my university getting 3rd injections"*	34

Personal factors included allergies, the individual's experience with the injections and desires for vaccines. Some participants with a history of allergies felt extremely worried before vaccination, but this feeling decreased over time because of their experience in the previous injections *(quote 14 - 15)*. The participants who received their desired vaccine would also feel more satisfied than those who did not get the types of vaccine that they wanted *(quote 16 - 17)*.

Support from family and friends during vaccination and post-injection care helped some of them feel less anxious and afraid during the injection process *(quote 18 - 19)*.

Vaccine was reported as one of the important factors, which include: type of vaccine, origin, licensing, and combination injection issues. Most of the people wanted to get Pfizer injection or wished to be vaccinated with the same vaccine as the previous one to improve immunity *(quote 20 - 21)*. The origin of the vaccine was quite a matter of concern because most people gave preference to vaccines of European and American rather than vaccines of Asian *(quote 22)*. In addition, being licensed by the United States also contributed to

strengthening the confidence of research participants *(quote 23)*. And the issue of combined vaccination also made many participants worry and feel unsafe *(quote 24)*.

With the vaccination environment, people receiving injections at central medical facilities said that they felt more secure in terms of facilities as well as professionalism in the practice of medical staff *(quote 25)*. In addition, vaccination facilities having trained and skilled medical staff in emergency management after injection was also a factor to help people feel more secure *(quote 26)*.

The respondents accessed information from various sources. Official information from the Ministry of Health and current affairs was the first source of information access *(quote 27)*. Participants also actively searched for information about vaccines on a number of websites both at home and abroad *(quote 28)*. One of the most accessible and easiest means of communication today was social networking *(quote 29)*. In addition, the influence from an individual reputable doctor and other people's previous injection experiences also played an important role *(quote 30 - 31)*.

Some other social factors were also reported, including: epidemic developments, policy mechanisms and crowd effects *(quote 32 - 34)*.

IV. DISCUSSION

Research results showed that the majority of participants experienced post-injection symptoms, among which the most commonly reported side effects were at the injection site. In addition, the occurrence of adverse effects was reported to be the highest in Moderna vaccine in comparison with AstraZeneca and Pfizer-BioNTech. This finding was consistent with the reports from the Vaccine Adverse Event Reporting System created by CDC and FDA (2). At the same time, we found that participants had diverse vaccination experiences, with both negative experiences (anxiety, suspense, fear) and positive experiences (non-anxiety, satisfaction). The negative experiences during the injection procedure were mostly related to post-injection symptoms and were most common in the first dose. A study on side effects and perceptions after COVID-19 vaccination in Jordan also showed that more than half of the participants had psychological fear of post-injection side effects. In addition, the quality of the vaccines, injection environment and combinations of different vaccines had also been reported to cause negative experiences. This could be attributed to the limited access to the information about the vaccine and the reports of side effects after the injection as well as the short trial period of the vaccine. However, the negative reactions all tended to subside with the injections. On the other hand, the majority of positive reactions occurred from the second and third injections after being consulted by people who had been vaccinated before or trusted in the quality of the vaccine. The reasons for the satisfaction or non-anxiety were reported after having at least one injection, not suffering from side effects after injection or having COVID-19 before. The explanation for this problem was that at the time that the second and the third injection was implemented, the vaccine coverage was higher, the information related to the vaccine was more available to access. People who had been positive to COVID-19 without symptoms or with mild symptoms reported to have less anxiety than before.

Among the factors involved, the injection experience was influenced mostly by the vaccine factor, especially the type of vaccine. This was reasonable when the fear of side effects after injection caused many people to express a need for vaccines with less reported side effects (6). In addition, due to the vaccine situation in the world and in Vietnam, people could not freely choose the vaccine they want, which usually led to negative experiences. The injection environment including the location, the professionalism of the medical staff was also noted to have a significant influence on the experience. Hospitals at the central level were trusted more than local hospitals in terms of both facilities and the professionalism of medical staff, which was consistent with the result of M.C. Duong (2022) (4). Regarding the individual factor, the experience between injections had a positive influence on hesitancy. This result was similar to the study of Hatmal (2022), people after having COVID-19 vaccines showed a tendency to advise people around them to get injections (7). Besides, a number of other social factors such as the epidemic situation at the time of vaccination was recorded to heighten the needs of participants. This result was similar to the study by M.C.Duong (2022) that despite of the high percentage of hesitancy among citizens, they would still receive the injection if the pandemic situation increases the possibility of being infected with COVID-19 (4). The common reference mentioned included official information from the Ministry of Health, national television stations, and then information from the press and medical experts. This firm belief might stem from the trust in the Vietnamese government's media management as mentioned in Duong's study (2017) (3).

Our limit was that this cross-sectional study could not present the causal relationship. Also, although we collected some information to avoid errors, the quality of the online survey also depends on the honesty of the participants.

V. CONCLUSION

The three most reported post-vaccination symptoms were fever, tiredness and symptoms at the injection site. Our research shows that some experiences with a COVID-19 vaccine included 5 main feelings: anxiety, suspense, fear, non-anxiety, and satisfaction. In particular, negative experiences were mainly related to post-injection side effects and most common at the first dose of vaccine. Positive reactions were more common from the second and third injections. On top of that, 6 common related factors were found, including: Individual factors; Family and friends; Vaccines; Injection environment; Reference sources and other Social factors. The vaccine factor was reported to have the most impact on vaccination experience.

On that basis, we make the following recommendations to contribute to the enhance the vaccine coverage and improve the quality of vaccination process

1. Strengthen the professionalism in the vaccination organization process as well as improve the effectiveness of pre-, during and post-injection consultations of local health care vaccination facilities.

2. Regularly update and ensure the quality of information sources, official information channels that students often refer to.

3. Update injection information on the electronic system for easy access by injection users and agencies and organizations.

REFERENCES

1. **Asres F, Umeta B.** COVID-19 vaccines: awareness, attitude and acceptance among undergraduate University students. J Pharm Policy Pract. 2022;15(1):32.
2. **CDC.** Vaccine Adverse Event Reporting System (VAERS): September 8, 2022; 2022 [cited 2023 January 16]. Available from: https://www.cdc.gov/vaccinesafety/ensuringsafety/monitoring/vaers/index.html.
3. **Duong M.** Blogging three ways in Vietnam's political blogosphere. Contemporary Southeast Asia: A journal of International and strategic affairs. 2017;39(2):373-92.
4. **Duong MC, Nguyen HT, Duong M.** Evaluating COVID-19 vaccine hesitancy: A qualitative study from Vietnam. Diabetes Metab Syndr. 2022;16(1):102363.
5. **Edouard Mathieu HR, Lucas Rodés-Guirao, Cameron Appel, Charlie Giattino, Joe Hasell, Bobbie Macdonald, Saloni Dattani, Diana Beltekian, Esteban Ortiz-Ospina and Max Roser.** Coronavirus Pandemic (COVID-19) Published online at OurWorldInData.org2020 [cited 2023 11/05]. Available from: https://ourworldindata.org/covid-vaccinations.
6. **Qin C, Wang R, Tao L, Liu M, Liu J.** Acceptance of a Third Dose of COVID-19 Vaccine and Associated Factors in China Based on Health Belief Model: A National Cross-Sectional Study. Vaccines (Basel). 2022;10(1).
7. **Saied SM, Saied EM, Kabbash IA, Abdo SAE.** Vaccine hesitancy: Beliefs and barriers associated with COVID-19 vaccination among Egyptian medical students. J Med Virol. 2021;93(7):4280-91

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