

A SURVEY ABOUT THE ATTITUDE TOWARDS COVID-19 VACCINATION AMONG THE STUDENTS AT THE FACULTY OF MEDICINE – SKOPJE, REPUBLIC OF NORTH MACEDONIA

Jasna Bogdanska ¹, Sonja Topuzovska ¹, Katerina Tosheska Tajkovska, Svetlana Cekovska¹, Hristina Ampova ¹, Melda Emin ¹, Elena Stanojevska Petrushevska ¹, Irma Duma ², Dushanka Grujoska-Veta ³

¹ Department of Medical and Experimental Biochemistry and Biochemistry and Clinical Biochemistry, Medical Faculty, Ss. Cyril and Methodius University in Skopje, R. North Macedonia. ² Postgraduate student-Public Health, Medical Faculty, Ss. Cyril and Methodius” University in Skopje, R. North Macedonia, ³ University Clinic for Traumatology, Orthopedic Diseases, Anesthesiology, Reanimation and Intensive Care, Medical Faculty, Ss. Cyril and Methodius University in Skopje, R. North Macedonia

Abstract

The SARS-Cov-2 virus represents the most important challenge for public health worldwide. In order to prevent the spread of the virus, vaccines from different suppliers were introduced in the Republic of North Macedonia. Bearing in mind that vaccination is not obligatory, the present survey was designed in order to evaluate the personal attitude towards vaccination among the first and second year students at the Medical Faculty in Skopje.

In total, 427 students consented for participation in the survey. Overall, 46% out of all participants considered that vaccination should be mandatory among the healthcare workers and medical students. Most of the participants, overall 75% of total, expressed the willingness to receive the vaccine for the sake of public health and for their own families. Fifty-three percent of the students were willing to receive the vaccine from any manufacturer in order to contribute to the public health, but most of them have expressed their willingness to live with the restrictive measures for an unlimited time.

The overall attitude towards general vaccination was highly positive (84% of all participants).

We can conclude that, most of the first and second year students at the Medical Faculty, have expressed their willingness to receive the vaccine against Covid-19.

Keywords: attitude towards Covid-19 vaccine, attitude towards vaccination.

Introduction

The Coronavirus disease (COVID-19) is caused by the new coronavirus strain-severe acute respiratory syndrome coronavirus 2 (SARS-Cov-2), which, so far, has affected more than 260 million people worldwide, causing more than five million deaths [1,2].

Due to its rapid spread ability, it has become the biggest challenge to the current health care systems all over the world. In the beginning, in our country, as well as elsewhere, social distancing and mask-wearing have been the main control measures for controlling the spread of the disease [3].

In addition, many other global efforts have been applied, with the main goal of decreasing of the negative outcomes of the COVID-19 pandemic [4]. One of these goals is the massive global application of safe and effective vaccines against COVID-19. Therefore, our government has put intensive efforts to supply our population with sufficient doses of vaccines from different manufacturers authorized from EMA, but also for emergency use from WHO.

The vaccination process started in mid February 2021 with healthcare workers, showing a very slow progression until the end of November. Only 38% of the total population has been fully vaccinated, which is below the global vaccination standards. The common factors for acceptance of COVID-19 vaccination should include approval of its safety and effectiveness by the government, necessary recommendations from the employer and cost-effectiveness [5]. Vaccination as a process has played an essential role in reducing the burden of a disease, disability and deaths. [6].

Since approximately 70% of the population must be vaccinated against Covid-19 in order to achieve the maximum efficacy of this strategy, one of the most important concerns of our Ministry of Health, as well as among the health authorities globally, has been vaccine hesitancy [7]. In addition to vaccination, the other hygiene measures and social distancing should be employed and are necessary in order to control the spreading of the virus [8].

Despite the importance of COVID-19 vaccination, and the success of its application worldwide, hesitancy to take the vaccine is common among various populations, and across cultures and education levels. The WHO declared vaccine hesitancy as one of the top ten threats to global health in 2019 [9]. According to the Strategy Advisory Group of Experts on Immunization, vaccine hesitancy refers to “a delay in acceptance or refusal of the vaccination, despite the availability of vaccination services” [10]. Present day endorsement of vaccine hesitancy is a known phenomenon, with roots that have accompanied vaccination since its scientific inception.

Globally, this phenomenon has resulted in the revival of some infectious diseases that could have been eradicated through mass vaccination, such as measles, poliomyelitis and pertussis [11]. Anti-vaccination groups are active against vaccination itself, as well as, against the COVID-19 vaccine, using popular social media and becoming a more relevant source of information and recommendations among the general population in our country.

In the lack of a legislative for obligatory vaccination among a certain group of population, and a more extensive campaign by the health authorities, and activities of all healthcare workers (including students) and patients who have been suffering from SARS Cov-2, the present study was designed to assess the attitude towards the COVID-19 vaccination among the first and second year students at the Medical Faculty, University “Ss. Cyril and Methodius” in Skopje, Republic of North Macedonia.

Material and methods

Study design and setting

The study was conducted at the Medical Faculty, University “Ss. Cyril and Methodius” Skopje. A sample of 427 participants was recruited among the first and second year students (both sexes) during a 28-day period (November-December 2021). The survey was anonymous and was conducted through a link using the Microsoft Office platform. It was inclusive for both vaccinated and unvaccinated students, and an informed consent form was included as well.

Survey Questionnaire

The structured questionnaire consisted of 28 questions and the consenting participants were asked to answer on four themes: demographic characteristics (gender, age and previous vaccination status), attitudes about COVID-19, willingness to vaccinate against COVID-19, trust/mistrust in vaccination and strategies, sources of information (their quality and the need for additional information), information about the side effects of the COVID-19 vaccines and their attitude towards vaccination as a process.

The perception of the risk of the disease and transmission were measured on a 1-5 point Likert scale, ranging from 1 strongly agree to 5 strongly disagree. Beliefs about the usefulness of the vaccine was measured on a 5-point Likert scale, ranging from 1 (strongly agree to strongly disagree). The trust/mistrust in vaccination/vaccines against COVID-19 among the healthcare workers, as well as the awareness of the side effects were measured on a 1-5 point Likert scale, ranging from 1 strongly agree for obligatory vaccination to 5 strongly disagree for trust/mistrust in the vaccination, and 7 point Likert scale was used for the sources of information for COVID-19 vaccination, ranging from 1 information from WHO and Ministry of Health to 7 information collected from the daily news papers.

The side effects of the vaccines were measured as the listed side effects from the manufacturers, but also as side effects that are spread trough social media, such as sterility and hair loss. The attitudes towards vaccination against COVID-19 as an obligatory one for the health care workers, as well as to the

booster doses were measured on a 2-point and 3-point Likert scale respectively. The data are presented as frequencies and percentages of the variables from the total number of the participants.

Results

The results of the socio-demographic characteristics are presented in Table 1. Most of the students were females aged 21-22 years. Seventy percent of the first and second year students were fully vaccinated. Ninety-six percent of the students have received all the obligatory vaccines during their lifetime, and only 2% strongly disagree that vaccines are the most important invention of the 20th century in the eradication of some diseases.

Table 1. Socio-demographic characteristics of the survey sample (N=427).

Variables	N	Percentage (%)
Sex		
Female	334	78
Male	93	22
Age (years)		
18-19	13	3
19-20	133	32
20-21	93	22
21-22	180	43
Have you received the COVID-19 vaccine?		
Yes	299	70
No	128	30
Have you received all the necessary vaccines in your lifetime?		
Yes	409	96
No	5	1
Just a few	8	2
I don't know	3	1
Was the unwillingness to receive the obligatory vaccines during your lifetime your decision?		
Yes	46	68
No	22	32
Do you agree that vaccines contribute in eradication of some diseases?		
Strongly agree	383	90
Strongly disagree	11	2
I don't know	30	8

The personal perception of the COVID-19 disease among the medical students is presented in Table 2. Most of the students (84%), completely agreed that COVID-19 is a serious disease and partly agree (53%) that it could be prevented. Most of the students (45%), had a personal perception of being at risk to get sick from COVID-19 and 11% claimed not to be at risk at all.

Most of them were concerned not to get sick from social events (36%), but almost 20% were not concerned at all.

Table 2. Perception of COVID-19.

Answer of the following questions	N	Percentages (%)
COVID-19 is a serious disease		
Completely agree	389	84
I am not sure	37	8
Completely disagree	37	8
COVID-19 can be prevented		
Completely agree	169	40
Partly agree	226	53
I don't know	8	2
I am not sure	13	3
I don't think so	10	2
Completely disagree	0	0
Your personal assessment for being at risk to get sick from COVID-19		
At high risk	29	7
At risk	190	45
Not in a risk	46	11
Not in a high risk	160	38
I am concerned not to get ill		
From social events	152	36
From unvaccinated persons	115	27
At the University	78	18
I am not concerned at all	79	19
Your personal assessment that you can spread the virus among the members of your family (multiple answers)		
I can spread the virus as long as there are unvaccinated persons	178	42
I can spread the virus even if being vaccinated	291	68
I cannot spread the virus because I am not contacting anyone	21	5
I cannot spread the virus because even in the café I am wearing a face musk	6	1
I don't have any opinion	37	9
I cannot spread the virus because the virus does not exist	1	0.2
Your personal assessment that you can spread the virus among the students and teachers at the University		
Yes, I can spread it	396	93
I am not sure	9	2
I am not familiar with any such case	15	4
No	7	2

I assume that I can live like this (with social distancing, lockdowns, and other restriction measures)		
For a short period	117	28
Unlimited period as long as the virus is circulating	222	53
For the next two to four years	33	8
The rest of my life	49	12

Most of them (68%) thought that they could be a source of spreading the virus, to the members of their families and among the university staff and students, even being vaccinated (93% respectively). The willingness to live with the restrictive measures, as long as the virus is circulating in the population was expressed by most of the students (53%), but 12% of the students were willing to live with restrictive measures for the rest of their lives.

The personal attitude of medical students towards COVID-19 vaccination is presented in Table 3. Most of the students (84%) had a positive attitude, but 13% haven't declared any attitude towards COVID-19 vaccination. Half of them declared a positive attitude towards obligatory/vaccination by a personal choice among the general population (48%).

In regard to the reason for getting vaccinated, most of the students expressed their willingness to receive the vaccine in order to contribute to the herd immunity and the public health, and not to spread the virus among their family members (74 and 75% respectively).

For 24% of the students, the reason to get vaccinated was because they felt confident with the information from WHO and the Ministry of Health, which is less than the reason to travel (24% and 33% respectively). The personal attitude towards COVID-19 vaccines was based on scientific publications and information from WHO and

Table 3. Attitude of the medical students towards COVID-19 vaccination.

Answers of the following questions	Frequency (N)	Percentages (%)
Your attitude towards vaccination as a process		
Positive	359	84
Negative	12	3
I don't have any attitude	54	13
Your personal attitude toward COVID-19 vaccine (multiple answers)		
Positive attitude towards obligatory vaccination for the population	219	48
Positive attitude towards vaccination as a personal choice	226	48
I agree with the politics of the government	12	3
I don't have any attitude	9	2
I haven't been thinking of this issue	7	1
The reason to be vaccinated against COVID-19		
Not to get sick from COVID-19	257	60
To contribute to the herd immunity and public health	316	74
Not to spread the virus among my family	321	75
Because I trust the WHO and the Ministry of Health	101	24
To be able to travel	144	33

To be able to go in the restaurants	73	17
To be able to attend parties	70	16
To be able to visit shopping malls	55	13
My personal attitude towards the COVID-19 vaccines is based on		
The information from WHO and Ministry of Health	302	71
The information from scientific articles	318	74
The information from the social media	71	17
My parents opinion about the vaccine	63	15
The chats with friends	44	10
The information from TV	61	14
The willingness for getting a vaccine from a certain supplier		
Only Pfizer	120	28
Only Sinovac	75	17
Only Astra Zeneca		
Whatever available to contribute to the public health	227	53
I will never receive the vaccine	15	3
I am not trust the COVID-19 vaccines	29	7
Will you receive the COVID-19 vaccine if it becomes obligatory		
Yes	367	89
No	44	11
Will you receive booster doses as many times as necessary		
Yes	170	40
No	118	28
I don't know	137	32

Ministry of Health (74% and 71% respectively), but also on the information from social media and chats with friends (17% and 10% respectively). Most of the students expressed their willingness to receive the COVID-19 vaccine from any supplier, but 7% were not confident in the vaccine and 3% declared that they would never receive the vaccine. On the other hand, most of them were willing to receive the COVID-19 vaccine if it was obligatory (89%), and to receive as many booster doses as necessary (40%).

The reasons for unwillingness to receive the COVID-19 are presented in Table 4. Most of the students found out that the information about vaccines are insufficient (38%) and that they were concerned about the side effects (58%).

The vast majority of the students were informed about the common side effects such as: fever, pain from the jab, muscle pains, allergic reactions, thromboembolic reactions, but almost 100% of the male students were concerned about sterility, although only 15% of the students have previously checked their fertility status.

Table 4. Reasons for unwillingness to receive the COVID-19 vaccine among medical students

I found the quality of the information about COVID-19 from my perspective		
Excellent	19	4
Very good	69	16
Good	140	33
Insufficient	163	38
I haven't been thinking	35	8
I am concerned about the side effects from the vaccines		
Yes	248	58
No	176	42
Side effects that I have been informed are		
Pain from the jab	324	76
Muscle pain	231	54
Fever	365	85
Allergic reactions	182	43
Thromboembolic reactions	221	52
Hair loss	63	15
Menstrual cycle loss	100	23
Female sterility	129	30
Male sterility	92	21
Other	85	20
I have checked my fertility previously		
Yes	32	15
No	187	85
Do you need more information about COVID-19 vaccines and vaccination		
Yes	292	69
No	92	22
I don't have any opinion	42	10
What kind of additional information do you need		
For the side effects	233	54
For the efficiency of the vaccines	228	53
For reading of the published literature about the side effects of the COVID-19 vaccine	164	38
For knowing more about the post-vicinal deaths	134	31
Else	48	11

The unwillingness to get vaccinated, for most of the students was that they need additional information about the side effects and the efficiency of the COVID-19 vaccines (54% and 53% respectively), and almost the same percent of the students declared that they need additional information from reading the scientific papers and information about the death outcomes from the vaccine.

The attitude of the medical students towards the health care system is presented in Table 5. Seventy-eight percent of the students strongly disagree that the hospitals should be reorganized in order to treat COVID-19 patients exclusively, but 12% of them didn't have any opinion in regard to this question. Almost all of them thought that the patients with chronic diseases are in risk because of the virus spreading and burden of the hospitals with COVID-19 patients. Most of them strongly agreed that vaccinating over 70% of the general population would decrease the health care system burden, but 12% of the students strongly disagreed or declared that they didn't know (17% respectively).

Table 5. The attitude towards COVID-19 vaccination in regard to the healthcare burden.

Answer the following questions	N	Percentage (%)
The hospitals should be reorganized in order to treat only COVID-19 patients		
Strongly agree	40	10
Strongly disagree	334	78
I don't have any opinion	52	12
Do you think that because of the virus spreading the patients with chronic diseases are put in risk		
Yes	390	92
No	9	2
I don't have any opinion	17	4
I haven't been thinking about this problem	8	2
COVID-19 patients must have priority	1	0
COVID vaccination over 70% on the general population will decrease the hospitals burden		
Strongly agree	283	65
Strongly disagree	54	12
I don't know	76	17
I haven't been thinking about this problem	21	5
I don't care	3	1

Discussion

This pilot study aimed to examine the attitude in regard to COVID-19 and COVID-19 vaccination among first and second year students at the Medical Faculty, University "Ss. Cyril and Methodius", Skopje. The lack of effective treatment of COVID-19 has created an urgent need for global immunization. Vaccine development and production was one of the greatest challenges of the 21st century, besides the healthcare management during the pandemic. Even before the pandemic, vaccine hesitancy was identified by the WHO as a potential threat for global health [12]. Different studies have evaluated the intentions of the general population towards COVID-19 vaccination during the first year of the pandemic.

The highest intention for vaccination was observed in China, while the countries with the worse statistic intentions were Nigeria and Kuwait [13-15]. Up to date, 56% from the world population had received at least one dose, with the highest rate of fully vaccinated people against COVID-19 being in the Arab Emirates (88.4%) and the lowest in Tanzania (1.75% respectively) [16].

In the Republic of North Macedonia, so far, the vaccination status of the general population is less than 40% (35% of the population is fully vaccinated), which is one-half of the estimated coverage of 70% for achieving the maximum effectiveness [17-20]. The vaccination data suggest inability of our country to reach the desired herd immunity threshold. In the present pilot study, we obtained the information about the personal attitude of the medical students, as future health-care workers, towards the COVID-19 pandemic and vaccination. In general, most of the students had a positive attitude towards vaccination as a process and towards COVID-19 vaccination due to their perception that COVID-19 is a serious disease. Similar results were seen from certain European countries where the willingness to take the vaccine was found to be 62% in France, 80% in Denmark and in the UK [21].

Most of the students considered being at risk to get the COVID-19 from social events and were aware about the possibility to spread the virus among the unvaccinated persons, as well as to the members of their families, and the university staff and colleagues. Although there was a positive attitude towards the obligatory or personal choice vaccination, some students expressed their willingness to live with the restrictive measures for the rest of the lives.

The willingness to receive COVID-19 vaccine was mostly motivated from the fear of the disease and for their families, but also in order to contribute to herd immunity and public health. In regard to the latest, most of them were willing to receive the vaccine from any supplier, but surprisingly 3-7% declared rejection of the vaccination or expressed their distrust in COVID-19 vaccines, although most of them claimed that their personal attitude was based on the information of the scientific articles (74%). There was a certain influence of their attitude by the social media, parents and friends (17%, 15% and 10% respectively).

The influential and authoritative persons in the country have a negative strong influence to the public opinion about the COVID-19 vaccination, claiming that the virus has been an illusion, that the vaccines are used for implantation of Nano-chips in order to achieve the full control over the population through 5G towers and that the virus was deliberately created in order of its global spreading. This might be one of the most important concerns, not only in our country, but also in many societies, since this influence is enhancing the doubts in COVID-19 vaccines among the general population and their resistance to vaccination [22- 24].

The unwillingness to receive the COVID-19 vaccine among the medical students was due to several reasons such as: insufficient body of information about side effects, efficiency of the vaccines and possible deaths outcomes. Among the side effects that the students were concerned were the common side effects listed by the manufacturers, but also menstrual and hair loss, as well as sterility, especially among the male students.

Regardless the side effects that the students are concerned about, most of them were willing to receive the booster dose or to be vaccinated if the COVID-19 vaccination becomes obligatory. Most of them strongly disagreed that the hospitals should treat only the COVID-19 patients.

Different factors might be related to unwillingness to receive the COVID-19 vaccine that should be tested in another survey. Among the factors that might influence the willingness/unwillingness to receive the vaccine are sex, as reported in health care workers in the USA, Israel and Ghana (25, 26, 27); age, as evidenced from the studies on the health care workers in Belgium, Canada, France, Greece, Slovenia etc.(28, 29, 30, 31, 32); concerns about safety of the vaccines, as reported by Szmyd B et al, Fares S. et al. [33, 34], education as reported by Shekhar R et al., Rapisarda V et al. and Rhodes A et al. 35- 37] and inadequate time for decision [29].

Limitations

This pilot study is subject to several limitations. The sample is small due to the enrollment of the first and second year students. The statistical analyzes, such as linear regression analyzes, distribution, significance between multiple groups and factors were not calculated.

Future analyzes should be undertaken in order to obtain more relevant data that might be used for the policy strategies.

Conclusion

The present study has shown that the medical students are willing to receive COVID-19 vaccines and booster doses in order to contribute to public health. It might be beneficial for the vaccination proportion that the medical students are included in the vaccination promotions, through social media and contacts, especially to non-regular social media users.

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