Awareness and likelihood of accepting COVID-19 vaccines among the university students of Bangladesh

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Article Info

ABSTRACT

Massive vaccination is very important to end the coronavirus disease 2019 (COVID-19) pandemic. This study determined the willingness to receive a COVID-19 vaccine by the university students of Bangladesh and identified their apprehension about the effectiveness and safety of COVID-19 vaccines. Students were invited to complete an online cross-sectional survey (April 3 to June 10, 2021) to explore the intention to receive a COVID-19 vaccine and other factors regarding the responsiveness of the COVID-19 vaccine. Among the 191 respondent students, 52.9% willingly agreed to receive a vaccine, where the remaining was either not decided yet (27.7%) or was not intended to get vaccinated (15.7%). The odd of getting a vaccine were only 1.15. About 83.2% of students were conscious about the severity of COVID-19 and many students responded that they are well-versed about vaccine activity (67.5%) and risk factors (66%). Among the approved vaccines, most students preferred the Oxford-AstraZeneca COVID-19 vaccine ChAdOx1 (38.7%) and Pfizer-BioNTech COVID-19 vaccine BNT162b2 (34%). As some of the students still have lesser intent to accept vaccines, public health officials need to be more proactive to focus on vaccine safety and benefits to enhance vaccine coverage among university students of Bangladesh.

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1. INTRODUCTION

The coronavirus disease 2019 (COVID-19) is caused by severe acute respiratory syndrome 2 (SARS-Cov-2). The disease was first diagnosed in the Wuhan province of China and immediately spread across the world, causing a great loss of lives, economy, and healthcare [1], [2]. As a novel β-coronaviruses, SARS-Cov-2 exhibits 79% genome sequence similarity with SARS-Cov-2 and 50% sequence similarity with Middle East respiratory syndrome coronavirus (MERS-Cov) [3], [4]. It is a contagious viral infection carried by inhaling or ingesting virus-containing droplets through coughing and sneezing, as well as touching an infected surface [5]. SARS-Cov-2 uses angiotensin-converting enzyme 2 receptor for infection and cell entry, similar to SARS-Cov-2 in humans [3], [6]. Because of the great prevalence and extensive dispersion of coronaviruses, their large genetic diversity and frequent mutation of genomes, and the rise in human-animal interface activities, new coronaviruses appear to originate in humans regularly [2]. The world health organization (WHO) declared the COVID-19 outbreak to be pandemic on March 11, 2020 [5], [7].

Currently, there are no effective treatments available to cure COVID-19 infection [8]. Therefore, a safe, effective and prophylactic vaccine is required to annihilate the pandemic, which caused devastating medical, economic, and social consequences [9], [10]. Clinical trials of vaccines have reported satisfactory results indicating that "vaccines are safe" (PM, 2020) and the higher rate of vaccine uptake by population results in the success of the vaccination program [11], [12]. However, vaccine development time and availability of vaccines aren't the only obstacles from a public health standpoint, intentions to get vaccinated by the general population should be checked, as vaccination may be rolled out more widely soon afterward, and adequate uptake of the vaccine is necessary to prevent the COVID-19 [12], [13].

To combat this pandemic, mass vaccination has started across Bangladesh. The first vaccine authorized for emergency use in Bangladesh was the Oxford-AstraZeneca vaccine and the administration of this vaccine first started on January 27, 2021 [7]. Recently Bangladesh also approved Russian Sputnik V, Chinese BBIBP-CorV, Moderna, and Pfizer–BioNTech COVID-19 vaccines and started a mass vaccination program. Since educational institutions of Bangladesh remain closed since March, 2020 nearly 38 million students in Bangladesh have missed out on the prospect to receive a proper education. To open the educational institutions, the government of Bangladesh plans to vaccinate all the teachers and students, especially at the university level.

The success of any vaccination program depends on widespread public education campaigns regarding vaccine safety and efficacy, and the positive attitude of the population to uptake a vaccine. However, there has been a significant rise in "vaccine hesitancy" worldwide. As reported by WHO, vaccine hesitancy is a complex concept defined as the refusal, lack of trust, reluctance, unwillingness, or delay in acceptance to vaccinate despite vaccine availability [14] which has harshly reduced vaccine uptake [15]–[18]. Vaccine apprehension thus impacts population coverage and, as a result, disease containment [1], [19].

It is time to see whether the country is ready to accept new vaccines against SARS-CoV-2. As university students have a high influence on the society of Bangladesh, understanding the predictors and factors influencing the intentions of university students to receive a COVID-19 vaccine will be a key to planning and optimizing the mass vaccination programs in Bangladesh. The major objective of this study was to understand the intention and awareness of university students of Bangladesh to receive a COVID-19 vaccine. The secondary objectives were to observe the concern of university students about the effectiveness and safety of COVID-19 vaccines that are using worldwide.

2. RESEARCH METHOD

2.1. Study design and population

An online-based cross-sectional survey was conducted using a "Google form" questionnaire to obtain responses from university students in Bangladesh. The survey timeline was from April 3 to June 10, 2021. To disseminate our online questionnaire, we used all social media platforms (Facebook, WhatsApp, and E-mail) as well as offline interviews of several participants over the telephone. Any individual living in Bangladesh and currently enrolled in a university was considered eligible for this survey. Participants were presented with a choice-based conjoint experiment to identify their knowledge about available vaccines and their likelihood of accepting one. After submitting responses, all participants were requested to avoid multi-registration and forward the questionnaire to their network. All participants' identities were kept private, and they were asked to submit genuine responses. At the end of data collection, responses from 191 participants were found. We used Microsoft excel 2019 for data collection and analysis.

2.2. Conjoint analysis

Conjoint analysis is a survey-based method from market research that has been used in healthresearch, including research examining factors associated with public preferences concerningvaccines. The approach approximates actual decisions and has been shown to moderately inform the estimation of future health behaviors. The choice-based conjoint analysis can examine thepotential influence of an extensive set of vaccine features on individual preferences in ways thatwould be difficult with a standard survey experimental design [13].

2.3. Survey

The survey questionnaire was designed based on guidelines from WHO [20] and by reviewing relevant kinds of literature. Our questionnaire includes questions about participants' characteristics (age, sex), health status, individual and family history of SARS-CoV-2 infection, knowledge, and preferences about available COVID-19 vaccines and intention to receive a vaccine against SARS-CoV-2. Participants were also requested to explain reasons if they weren't interested to get vaccinated. Participants' intention to receive a vaccine against SARS-CoV-2 was assessed using a question (Are you going to receive the vaccine available in Bangladesh?) with the options including "Yes", "No", "I already did", and "Not decided yet".

3.   RESULTS AND DISCUSSION

3.1. Participant's characteristics

Between April 3 and June 10, 2021 a total of 191 participants who are the students at the different university of Bangladesh have completed the online questionnaire. Table 1 presents their sociodemographic and health-related background. Among the participants, 72.8% were male and 27.2% were female where most of the participants (54.5%) were aged 17-22 years (undergraduate students). Fascinatingly, more than 90% of students are between the age limit of 17 and 25, which represents the youth population of our country. Most of the students (73.8%) were not affected by COVID-19 and around 71.2% of participants had no family history of COVID-19. A small fraction of students (8.4%) tested COVID-19, where 8.9% of students are involved in COVID-19 volunteer works. This study did not investigate the association between SARS-CoV-2 vaccination intent or hesitancy and sociodemographic variables (age, gender, and education). Because the specific student population used in this study was from a limited age range with similar educational qualifications. In one of the the previous study, there was no evidence of interactions found between age and gender in explaining the intention to take a vaccine [21]. Although another study estimates that male or married respondents had more intention to receive COVID-19 vaccination rapidly [22].

Table 1. Respondent demographics and COVID-19 related health feature

Characteristics	Answer	n (%)
Age	17-22	104 (54.5%)
	23-25	78 (40.8%)
	26 or above	9 (4.7%)
Sex	Male	139 (72.8%)
	Female	52 (27.2%)
Are you in any volunteer work related to COVID-19?	Yes	17 (8.9%)
	No	174 (91.9%)
Were you affected by COVID-19 before?	Yes	12 (6.3%)
	No	141 (73.8%)
	May be	38 (19.9%)
Did you test COVID-19 before?	Yes	16 (8.4%)
	No	175 (91.6)
Did anyone in your family have experienced COVID-19?	Yes	35 (18.3%)
	No	136 (71.2%)
	May be	20 (10.5%)

3.2. Participant's knowledge and awareness about COVID-19 vaccines

In this section, the participants responded to several questions related to the awareness of COVID-19 disease and COVID-19 vaccines as shown in Table 2. About 83.2% of participants believe that COVID-19 is a serious disease and people need to be more careful to control this pandemic, whereas the remaining is moderately serious or not at all. When we asked them if they knew how vaccines work and the side effects of vaccination, the majority of students (67.5% and 66% respectively) responded that they are informed about vaccine activity and risk factors. However, almost one-fifth of students (21%) think vaccines are less effective or not at all against COVID-19. This result will be helpful to increase awareness about the COVID-19 disease and its vaccination program among the students of Bangladesh. WHO has strongly recommended that everyone needs to be protected by full immunization regardless of occupation, education, income, wealth, and gender [23]. Consequently, smart planning is necessary to ensure full immunization of a large population of Bangladesh.

Table 2. Perceptions and awareness about COVID-19 and vaccination

Attitudes	n (%)
Belief about the severity of COVID-19 disease	Not serious 2 (1%)
	A little 3 (1.6%)
	Moderate 27 (14.1%)
	Quite serious 52 (27.2%)
	Very serious 107 (56%)
Belief about the effectiveness of COVID-19 vaccines	Not effective 8 (4.2%)
	Less effective 32 (16.8%)
	Moderately effective 79 (41.4%)
	Very effective 72 (37.7%)
Informed about the process of vaccine action	Yes 129 (67.5%)
	No 62 (32.5)
Informed about the side-effects of vaccines	Yes 126 (66%)
	No 30 (15.7%)
	Maybe 35 (18.3%)

3.3. Vaccine preferences

We provided a list of available vaccines which are approved by the US food and drug administration (FDA) and WHO. The clinical trial of different vaccines showed different effectiveness against COVID-19. The three major vaccines currently known are Pfizer, Moderna, and AstraZeneca vaccines. Pfizer and Moderna showed approximately 95% efficiency against COVID-19 [10], [24] whereas AstraZeneca showed around 90% efficiency against COVID-19 [25]. We asked the students to choose one for mass vaccination from the WHO-approved vaccine. Figure 1 presents the results of vaccine preferences. Among the vaccines provided, mostly chosen vaccines are the Oxford-AstraZeneca COVID-19 vaccine ChAdOx1 (38.7%) and the Pfizer-BioNTech COVID-19 vaccine BNT162b2 (34%). However, 17.8% of students have no vaccine preference and they will freely accept any approved vaccine offered by the government.
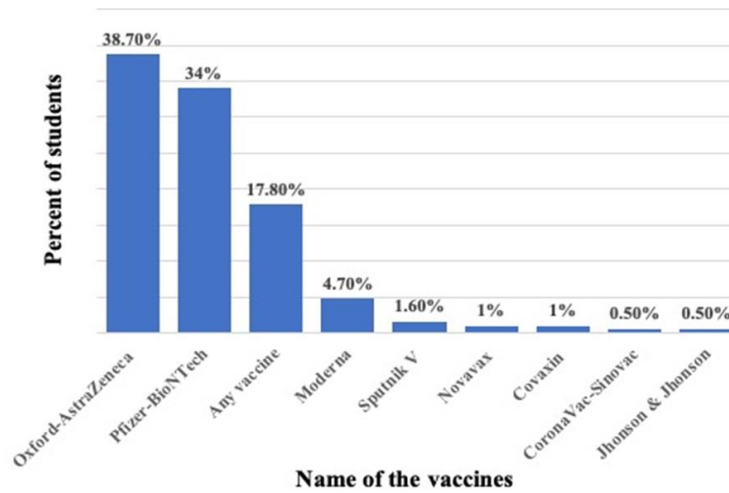
Figure 1. The preferences of different vaccines among the participating university students of Bangladesh

3.4. Reason for vaccine preferences

The students were knowledgeable about the effectiveness of vaccines and 51.9% of students preferred the vaccine that is most effective. The detailed reasons to prefer a vaccine were presented in Figure 2. Some students prefer the vaccines that are low price (7.9%) and some students (16.3%) depend on the availability of vaccines as shown in Figure 2. A majority of students (13.1%) depend on family and friends to choose a preferable vaccine. Very few students do not have any concern about the preferred vaccine as presented in Figure 2. Ending the COVID-19 pandemic will depend on unbiased access to safe and effective vaccines and safe and effective vaccines are a game-changing tool [26].
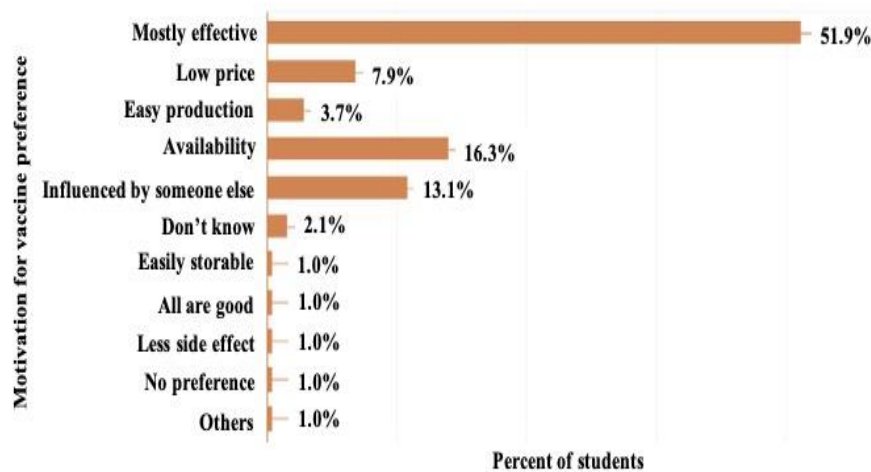

Figure 2. The motivation for vaccine preferences among the participating students

3.5. Intention to receive a COVID-19 vaccine among the students

Participants were asked whether they were willing to get vaccinated or not. Figure 3 demonstrates the results of the intent of participants to get vaccinated. The majority of students (52.9%) agreed to receive a vaccine, where the remaining was either not decided yet (27.7%) or wasn't intended to get vaccinated (15.7%). The odd of getting a vaccine are 1.15. However, considering the not decided group, 80.6% of students were somewhat conceivable to accept a COVID-19 vaccine when it will be available to the students. The intention of taking a vaccine among the students is fairly satisfactory and a 100% vaccination rate is achievable by proper demonstration and awareness campaigning. The success of COVID-19 vaccination programs and the pandemic controls are finally depending on the understanding of population-level intention to accept the COVID-19 vaccine [27].
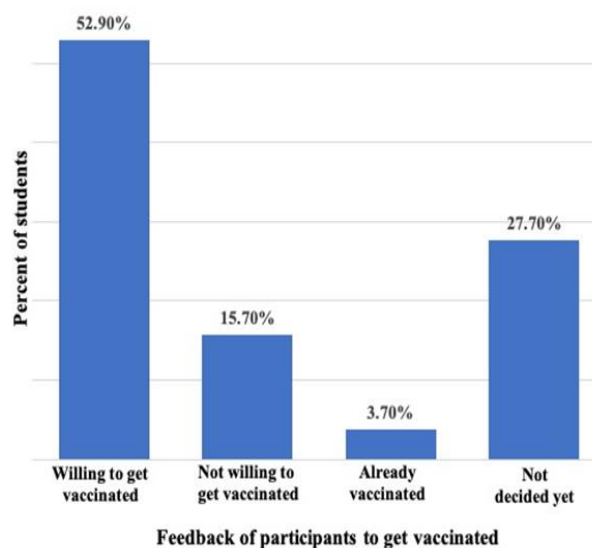
Figure 3. Intention to take COVID-19 vaccine among university students in Bangladesh

3.6. The reason for vaccine hesitancy among students

The students were asked why they did not want to get a vaccine. The reason for not get a vaccine is summarized in Figure 4. Interestingly, many students (15.5%) are still afraid to get vaccinated. It might be due to trypanophobia, an extreme fear of injections, or hypodermic needles. Consequently, many students believe that COVID-19 vaccines are not safe. The reason for this belief might be for a newly developed vaccine with an inadequate clinical trial. Interestingly, the majority of students (29.9%) do not trust the vaccine-producing company. It might be due to the insufficient knowledge of students about the vaccine producing safety and security, or it might be a behavioral phenomenon. Many people are inclined to believe rumors that are not based on science because they relied on social media for information. Furthermore, this could also be attributable to people's mistrust of the government [1].

Some students (27%) believe that vaccines will cause negative effects on health. This type of misconception might come from the rumors about the adverse side effects of the COVID-19 vaccine. On the other hand, some students (6.3%) do not believe in vaccination and some (1.6%) have a religious issue about not get vaccinated. Many other factors are also associated with vaccine hesitancy such as lower age, female gender, lower education, lower-income, black, and mixed ethnicities, not being single or widowed, not being a homeowner, not being employed full-time, and not retire [21].

3.7. How to overcome vaccine hesitancy

We provided some concepts to convince the students to get vaccinated if they are not decided yet. Table 3 represents some factors that can motivate a student to get vaccinated. A majority of students (48.4%) will be decided to participate in COVID-19 vaccination after observing the feedback of surrounding people who get the vaccine. It might be a social stand of students to notice the response of neighboring people to the COVID-19 vaccine and then go for it. Some students (35.2%) also want the details of clinical trials data to be public to decide on vaccination. Some students (21.9%) could be convinced to get vaccinated if the vaccine was approved and others (21.9%) could be convinced after a recommendation from a physician. Ultimately

the misconceptions need to be overcome by prebunking rather than debunking, and should provide a strong demonstration of truthful information immediately [28], [29].

This study reports about knowledge and intent to receive a vaccine against SARS-CoV-2 in university students. The study findings have shown that only 52.9% of students are willing to receive a vaccine. A great majority of students are still confused or hesitant to get a vaccine. To increase the self-confidence of students in COVID-19 vaccines, awareness agenda must focus on the advantage of vaccines to end this pandemic, which finally benefits all communities, families, and individuals. As our findings show that only 52.9% of students are willing to receive a vaccine, public health leadership needs to utilize their inspiration to motivate students to take the vaccine as soon as it is available.
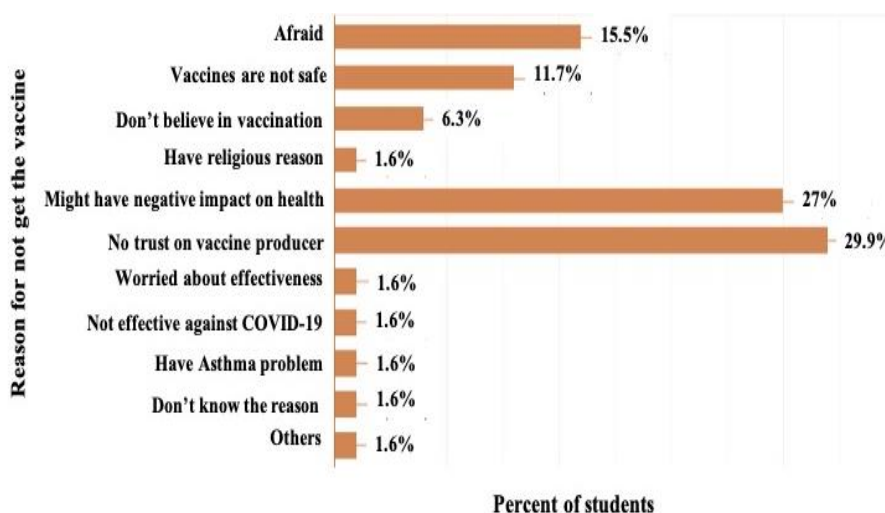
Figure 4. The reason for not getting vaccinated among the participating university students

Table 3. Factors to convince university students to get vaccinated

Motivation factor	n (%)
If my doctor would approve	22.7%
If legal authorities would approve	21.9%
If a detailed written review would be shared in public about how the vaccine is produced and what it contains	35.2%
I want to wait for a period to see about how other people react to that vaccine	48.4%
I want to observe its side effects	1.6%

To understand vaccine intentions, additional country-wide research is needed among the mass population of Bangladesh. Thus, future research investigation on COVID-19 vaccine intentions needs to be continuing to incorporate more validated data to achieve a full immunization goal. A limitation of this study was the population size, as it was difficult to access more students during this pandemic, and many students have no access to the internet also. Moreover, this study included a population of individuals who were students at the university level, who might not represent the whole scenario of vaccine hesitancy of the general population of Bangladesh.

4. CONCLUSION

The study findings provide a primary idea about the intent to receive a vaccine against SARS-CoV-2 among university students. While half of the students intend to receive the COVID-19 vaccine, the other half are still reluctant to decide to uptake the vaccine. However, it is very important to ensure the optimal uptake of vaccines by providing proper care and a legitimate education to all the communities. These results may help to inform the public health campaigns to address the vaccine hesitancy. The important awareness factors associated with vaccination could help the public health officials to make successful vaccination policies and immunization programs and provide valuable recommendations for complete immunization in different communities. The scientific community and the Bangladesh government should work together to overcome this dilemma around vaccination against SARS-CoV-2 among these populations and use proper scientific evidence to educate the population.

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