Willingness and Perception About COVID-19 Vaccine Among Rural Adults

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Abstract

Introduction:
The most successful and cost-effective method of preventing the spread of COVID-19 infection is vaccination. But there are challenges to vaccinating the mass population in a developing country like Bangladesh. This survey aimed to assess the willingness to receive and perception of COVID-19 vaccines and the association of this willingness with the baseline characteristics and the level of perception of the respondents.

Method:
This cross-sectional study was conducted among 672 rural people from six villages of Palashbari Upazilla, Gaibabdha district. A convenient sampling technique was used and data were collected by face-to-face interview.

Result:
Almost two third of the respondents of this study were ≥30 years old and the average age of respondents was 37.43±17.13 years. Majorities of the respondents were female (54.6%). About 89.1% of the respondents in this study were willing to be vaccinated and the main reason for this willingness includes respondents' belief about the vaccine protection against COVID-19 (91.8%) reduced the fear of the respondents (60.6%), government suggestion (45.1%). The main reasons behind unwillingness included fear of side effects (71.8%), doubt about vaccine safety and efficacy (46.5%), and ignorance (59.2%). Regarding perception about the COVID-19 vaccine, more than half of the respondents (51.2%) had good perception whereas 29.8% had average perception and 19.0% of respondents had poor perception. In this study, females were significantly more willing to be vaccinated than male respondents (p=0.027). Respondents age group <30 years were significantly more willing to vaccinate than that of the age group ≥30 years (p=0.042). Respondents not having chronic diseases group significantly more inclined to vaccinate than that having chronic diseases (p<0.001). A good level of perception was more likely to have willingness than average or poor perception (p<0.001).

Conclusion:
The findings of this study reveal that despite the high prevalence of willingness to receive vaccines, still there were the challenges. Policymakers should design effective immunization policies and experts in media and communication should deliver the proper message that is understandable to everyone, especially illiterate rural people.

Keywords: COVID-19 Vaccine, Willingness, Perception

Introduction:

The current corona virus (COVID-19) pandemic, which is caused by the severe acute respiratory syndrome corona virus 2 (SARS-CoV-2), is a serious issue all around the world, especially in South-east Asian countries[1]. The world's first reported case of COVID-19 was found in Wuhan city, Hubei province, China[2]. COVID-19 was declared a pandemic by the World Health Organization (WHO) on March 11, 2020, and as an international public health emergency[2]. More than 243 million people throughout the world had been identified as confirmed cases of corona virus disease in the last two years after the virus first emerged in December 2019[3]. After a massive fight against the corona virus, the development of a

vaccine brought a global sign of hope in 2021[4]. There were enough vaccine doses available worldwide to reduce the transmission and save countless lives as they reached the people who needed them the most. The best hope for saving lives and assuring a worldwide economic recovery is global access to COVID-19 vaccinations. In Bangladesh, the national vaccination campaign was launched on 7th February 2021 prioritizing the most vulnerable groups with the vaccine named Covishield4. The government began registering people aged 55 and up in the country using the Surokkha App on January 26, 2021. Surokkha is a website where people aged 18 and up can register for the vaccine. Bangladesh has launched a COVID-19 vaccination campaign for Rohingya refugees housed in one of the world's largest and most densely populated camps in Cox's Bazar, enrolling nearly forty thousand refugees aged 55 and up, demonstrating equity and inclusiveness, which are critical to contain in this ongoing pandemic[4]. In an effort to enhance the country's immunization rates, the minimum age requirement for registering for the COVID-19 vaccine had been decreased to 18 years that time[4]. In a short duration of time, researchers have developed several vaccines against COVID-19, with their efficacy as high as up to 95% in preventing symptomatic COVID-19 infection[5]. Successful immunization through vaccinating the majority of the population to reach herd immunity can reduce the global burden of illness and death[1,5-7]. And it's strongly linked with the acceptance of a vaccine by the people[6]. There were differences from country to country regarding the willingness of the people to receive the COVID-19 vaccine[1,5,6]. People's willingness to receive vaccines depends on several factors like risk perception of the disease, perception of the safety and efficacy of the vaccine, adverse health effects, history of vaccination, misconceptions regarding the urge for vaccine, lack of trust in the health system, lack of knowledge on vaccine among the community people to prevent the disease and sociodemographic characteristics[5-6]. This study was done to assess the prevalence of willingness to receive and perception of the COVID-19 vaccine among the rural population, at the same time determine the association of vaccination willingness with the baseline characteristics and the level of perception of the respondents in Palashbari, Gaibandha.

Material and Methods:
This cross-sectional type of descriptive study was carried out in six different villages of Palashbari Upazilla in Gaibandha District from 1st December to 31st December 2021. A total number of 672 respondents aged ≥18 years, who had not received the COVID-19 vaccine yet and were willing to participate, were included in the study. A convenient sampling technique was used for the selection of the respondents and data were collected through face-to-face interviews with the respondents using a pre-tested semi-structured questionnaire. Pretesting was done in the catchment area of Rangpur City Corporation. After getting the permission from concerned authority, respondents were interviewed with their informed verbal consent, and no harm to anyone or anything has been done during the study. Willingness was assessed by the respondent's answers to the questions regarding whether they are interested to receive the COVID-19 vaccine. The response was either 'Yes' or 'No'. Perception about the COVID-19 vaccine was assessed by asking 9 questions. The response to all questions was either 'Yes/No/Not Sure' and these responses were re-coded into correct and incorrect form. Respondents who correctly answered above 60% of the questions were categorized to have good perception, whereas respondents who correctly answered 40-60% of the questions were categorized to have average perception. Respondents who correctly answered below 40% of the questions were categorized to have poor perception. Data were edited and analyzed by SPSS software and expressed in frequency, means, and standard deviations. The association of willingness to be vaccinated with baseline characteristics and level of perception of the respondents was done by Pearson's Chi-square test.

Result:
Almost two-thirds (58.8%) of the respondents of this study were ≥30 years old and the average age of respondents was 37.43±17.13 years. Respondents of this study were female predominant (54.6%). Almost half (50.7%) of the respondent's educational status was below S.S.C and two-thirds (57.9%) of them were unemployed. The average monthly family income was 13178.9±8923.01 BDT. The majority of the respondents (78.3%) didn't have any chronic disease during this study (Table-I).

**Table-I: Socio-demographic characteristics of the respondents**

Variables	no.(%)
Sex	
Male	305 (45.4)
Female	367 (54.6)
Age group (years)	
< 30	277 (41.2)
≥ 30	395 (58.8)
Mean±SD	37.43±17.13
Educational status	
< SSC	341 (50.7)
≥ SSC	331 (49.3)
Employment status	
Employed	283 (42.1)
Unemployed	389 (57.9)
Economic status	
< 15000	433 (64.4)
≥ 15000	239 (35.6)
Mean±SD	13178.9±8923.01
Chronic disease status	
Yes	146 (21.7)
No	526 (78.3)

Regarding the perception of the COVID-19 vaccine, more than half (51.2%) of respondents had 'Good perception' whereas 29.8% had 'Average perception' and 19.0% of respondents had 'Poor perception' (Figure-1).
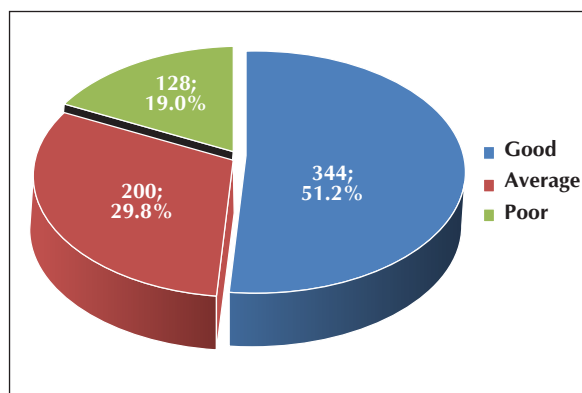
Figure-1: Distribution of respondents by level of perception

Majorities (89.1%) of the respondents in this study were interested to be vaccinated, and about 10.9% of respondents didn't show any interest (Figure-2).
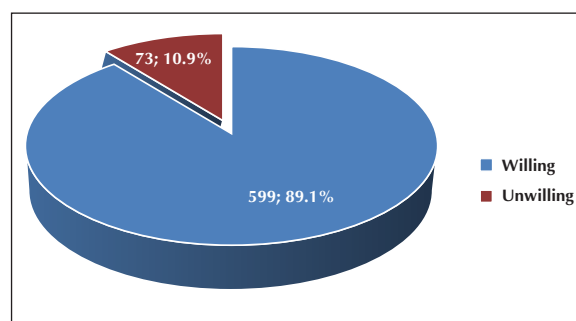
Figure-2: Distribution of the participant by willingness to vaccinate

The reasons that were intended by the respondents for willingness to be vaccinated included respondents' belief that the vaccine will protect them from COVID-19 (91.8%), it will reduce fear of COVID-19 (60.6%), government's suggestion (45.1%) & others 0.8% (advice from neighbors, it will prevent other diseases, etc.). The main reasons those were related to being unwilling towards receiving the Covid-19 vaccine included fear of side effects of vaccines (71.8%), doubt about vaccine safety & efficacy (46.5%), and ignorance (59.2%) (Table-II).

Table-II: Distribution of the Participants by reasons behind willingness and unwillingness to vaccinate

Attributes	no.(%)
Reasons behind willingness (n=599)	
Protect against COVID-19	550(91.8)
Reduce fear of COVID-19	363(60.6)
Government's suggestion	270(45.1)
Others	5(0.8)
Reasons behind unwillingness (n=73)	
Fear of side-effects	51(71.8)
Doubt on safety and efficacy	33(46.5)
Ignorance	42(59.2)

* Multiple responses

Table-II showed the association of respondents' willingness to vaccinate with their baseline characteristics. Female respondents were significantly more willing to vaccinate than that male respondents (p=0.027). Respondents of the age group <30 years were significantly more willing to vaccinate than that of the age group ≥30 years (p=0.042). Respondent's educational, occupation-

al, and economic status had no association with their vaccination willingness. Respondents not having chronic diseases group were significantly more willing to vaccinate than that of having chronic disease group (p<0.001).

Table-III: Association of respondents' willingness to vaccinate with baseline characteristics

| Variables | Willingness to vaccinate | | p-value |
	Willing no. (%)	Unwilling no. (%)	
Frequency (%)	599(89.1)	73(10.9)	
Sex			
Male	263(86.2)	42(13.8)	0.027
Female	336(91.6)	31(8.4)	
Age group (Years)			
<30	255(92.1)	22(7.9)	0.042
≥30	344(87.1)	51(12.9)	
Educational status			
<SSC	300(88.0)	41(12.0)	0.327
≥SSC	299(90.3)	32(9.7)	
Occupational Status			
Employed	249(88.0)	34(12.0)	0.413
Unemployed	350(90.0)	39(10.0)	
Income group (Taka)			
<15000	386(89.1)	47(10.9)	0.992
≥15000	213(89.1)	26(10.9)	
Chronic disease			
Yes	118(80.8)	28(19.2)	< 0.001
No	481(91.4)	45(8.6)	

A chi-square test for independence with α=0.05 was done to assess whether the level of perception was related to willingness to vaccinate. The chi-square test was statistically significant, $\chi2(2, N=672) = 66.47$, p < 0.001, with Phi (φ) coefficient of 0.31, indicating a medium relationship. As seen in Table-IV good level of perception was more likely to have willingness than average or poor perception.

Table-IV: Association of respondents' willingness to vaccinate with the level of perception

| Variables | Frequency (%) | Willingness to vaccinate | | p-value |
		Willing no. (%)	Unwilling no. (%)	
Frequency (%)		599 (89.1)	73 (10.9)	
Level of perception				
Good	344 (51.2)	334 (97.1)	10 (2.9)	
Average	200 ((29.7)	174 (87.0)	26 (13.0)	<0.001
Poor	128 (19.1)	91 (71.1)	37 (28.9)	

Pearson's chi-square (χ^2) test was done

Discussion:
Just after COVID-19 was declared a pandemic by WHO, scientists throughout the world were trying to develop a vaccine against this virus. After several trials, WHO finally advised to deploy some vaccines over the mass population across the world. The national regulatory body of Bangladesh introduced a mass vaccination program in January 2021 with a target to vaccinate 80% of the total adult population. But there were many challenges to achieving this target. The study aimed at to assess the prevalence of willingness to receive and perception of the COVID-19 vaccine at the same time determines the association of vaccination willingness with the baseline characteristics and the level of perception among the rural adults. This study found that the majority of the respondents (89.1%) were willing to be vaccinated and 51.2% of respondents had a good level of perception about the vaccine. A study conducted in Malaysia found that the Malaysian population had good knowledge and perception regarding the COVID-19 vaccine[2]. The prevalence of willingness of respondents to be vaccinated found in this study is almost similar to a study conducted in China (91.3%)[8] but higher than KSA (48%)[9], Pakistan (70.1%)[10], and Congo (56%)[11]. Almost two-thirds (58.8%) of the respondents of this study were ≥30 years old, and the average age of respondents was 37.43± 17.13 years. Respondents of the age group <30 years were significantly more willing to vaccinate than that of the age group ≥30 years (p= 0.042). Respondents of this study were female predominant (54.6%). Female respondents were significantly more willing to vaccinate than that male respondents (p=0.027). The study conducted among Malaysian adults also shows

that the respondents below 30 years of age and females strongly agreed to accept the COVID-19 vaccine than the respondent above 30 years or more and males[2]. Respondent's educational, occupational, and economic status had no association with their vaccination willingness. It is highly recommended that those who have chronic diseases (hypertension, diabetes mellitus, chronic kidney disease, chronic respiratory disease, joint pain, cancer, allergic illness, stroke) need urgent vaccination coverage, but this study reveals that respondents not having chronic diseases group significantly more willing to vaccinate than that of having chronic disease group (p<0.001) which is similar to the study conducted in Malaysia (p<0.001)[2]. Though the study revealed that about 89.1% of the respondents were interested to be vaccinated, but still about 10.9% of respondents were unwilling to be vaccinated. The main reasons those were related to being unwilling towards receiving the COVID-19 vaccine included fear of side effects of vaccines (71.8%), doubt about vaccine safety & efficacy (46.5%), and ignorance (59.2%). In a study conducted in the public of India, fear of side effects is also the main perceived barrier (75.52%)[6] whereas, in the Malaysian population, the fear of side effects is only 12.1% and doubt about vaccine efficacy is only 3.7%[2]. The main reasons that were intended by the respondents for willingness to be vaccinated included respondents' belief that the vaccine will protect them from COVID-19 (91.8%%), it will reduce fear of COVID-19 (60.6%), and the government's suggestion (45.1%). The main reason for the acceptance of the COVID-19 vaccine in India was also a belief that the vaccine will protect them from COVID-19[6]. A chi-square test for independence with α=0.05 was done to assess whether the level of perception was related to willingness to be vaccinated. The chi-square test was statistically significant, p<0.001. A good level of perception was more likely to have willingness than average or poor perception.

Conclusion:
The findings of the study revealed a high prevalence of willingness (89.1%) to receive the COVID-19 vaccine among the adult population in Palashbari, Gaibandha. Still, 10.9% of respondents were unwilling to be vaccinated. Public concerns about vaccine safety and efficacy may hinder vaccine acceptance among the Bangla-

deshi population. This survey also showed that only half of the respondents' perception regarding the COVID-19 vaccine was good enough. The acceptability rate was significantly low among the male population, those with chronic diseases, and the older age group (≥30 years). So, this finding can help the authority for planning future efforts to decrease the communication gap regarding the COVID-19 vaccine among the population, which makes them unaware of their health. The government and mass media should take some proper initiatives and strategies and ventilate the right messages to people. Moreover, individuals with chronic illnesses should also receive individualized health messages from healthcare specialists.

References:
1. Harapan H, Wagner AL, Yufika A, Winardi W, Anwar S, Gan AK, Setiawan AM, Rajamoorthy Y, Sofyan H, Mudatsir M. Acceptance of a COVID-19 Vaccine in Southeast Asia: A Cross-Sectional Study in Indonesia. Front Public Health. 2020 Jul 14;8:381. doi: 10.3389/fpubh.2020.00381
2. Mohamed NA, Solehan HM, Mohd Rani MD, Ithnin M, Che Isahak CI. Knowledge, acceptance and perception on COVID-19 vaccine among Malaysians: A web-based survey. PLoS One. 2021 Aug 13;16(8):e0256110. doi: 10.1371/journal.pone.0256110.
3. Anwar S, Nasrullah M, Hosen MJ. COVID-19 and Bangladesh: Challenges and How to Address Them. Front Public Health. 2020 Apr 30;8:154. doi: 10.3389/fpubh.2020.00154.
4. COVID-19 Vaccination: WHO supports an effective campaign in Bangladesh while strengthening vaccine roll-out preparedness for Rohingya. https://www.who.int/bangladesh/news/detail/20-05-2021-covid-19-vaccination-who-supports-an-effective-campaign-in-bangladesh-while-strengthening-vaccine-roll-out-preparedness-for-rohingya [Accessed 15th June 2023]
5. Paul A, Sikdar D, Mahanta J, Ghosh S, Jabed MA, Paul S, et al.Peoples' understanding, acceptance, and perceived challenges of vaccination against COVID-19: A cross-sectional study in Bangladesh. PLoS One. 2021 Aug 20;16(8):e0256493. doi: 10.1371/journal.pone.0256493.
6. Goruntla N, Chintamani SH, Bhanu P, Samyuktha S, Veerabhadrappa KV, Bhupalam P, et al. Predictors of acceptance and willingness to pay for the COVID-19 vaccine in the general public of India: A health belief model approach. Asian Pac J Trop Med. 2021;14(4): 165-175. https://pesquisa.bvsalud.org/global-literature-on-novel-coro-

navirus-2019-ncov/resource/pt/covidwho-1206389 [Accessed 15th June 2023]

7. Chew NWS, Cheong C, Kong G, Phua K, Ngiam JN, Tan BYQ, et al.An Asia-Pacific study on healthcare workers' perceptions of, and willingness to receive, the COVID-19 vaccination. Int J Infect Dis. 2021 May;106:52-60. doi: 10.1016/j.ijid.2021. 03.069.

8. Wang J, Jing R, Lai X, Zhang H, Lyu Y, Knoll MD, Fang H. Acceptance of COVID-19 Vaccination during the COVID-19 Pandemic in China. Vaccines (Basel). 2020 Aug 27;8(3):482. doi: 10.3390/vaccines8030482.

9. Alfageeh EI, Alshareef N, Angawi K, Alhazmi F, Chirwa GC. Acceptability of a COVID-19 Vaccine among the Saudi Population. Vaccines (Basel). 2021 Mar 5;9(3):226. doi: 10.3390/vaccines 9030226.

10. Qamar MA, Irfan O, Dhillon RA, Bhatti A, Sajid MI, Awan S, et al.Acceptance of COVID-19 Vaccine in Pakistan: A Nationwide Cross-Sectional Study. Cureus. 2021 Jul 24;13(7):e16603. doi: 10.7759/ cureus.16603.

11. Ditekemena JD, Nkamba DM, Mutwadi A, Mavoko HM, Fodjo JNS, Luhata C, et al. COVID-19 Vaccine Acceptance in the Democratic Republic of Congo: A Cross-Sectional Survey. Vaccines.2021 Feb; 9(153).doi:10. 3390/vaccines9020153