ORIGINAL RESEARCH

Perception, Preventive Practice, and Attitude Towards Vaccine Against COVID-19 Among Health Care Professionals in Bangladesh

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Background: Healthcare professionals (HCPs) are one of the vital and persuading means of information, prevention and control, and incentive of vaccination to content a pandemic. Therefore, knowing the status of HCPs' perception about symptoms, transmission, preventive measures, and attitudes towards a vaccine against COVID-19 is crucial.

Methods: This multi-center cross-sectional descriptive study was one of the first and foremost ones in Bangladesh among the HCPs - doctors, nurses, and other subordinates (MLSS) engaged at COVID-dedicated hospitals. The study was conducted from February 5, 2021, to March 7, 2021, using a convenience sampling method among 550 HCPs using structured questionnaire with twenty-five questions on a three-point scale of responses.

Results: The age range of the respondents were 18 to 64 years with the mean 36.17 ±10.94 years of 524 HCPs, of which the majority of the respondents were female 323 (61.6%) and 201 (38.4%) were male with the 95.27% response rate. Almost all participants had "high" or more than sufficient perception (94.34%) about the symptoms of COVID-19. But all categories of HCPs expressed their poor or fair practice about restraining from shaking hands, and only 6.84% of nurses, 8.33% doctors, and 11.59% of MLSS avoided crowded public gatherings as a practice of prevention. A majority (95.99%) of the HCPs showed positive attitudes about the availability of vaccines free of cost, and 87.40% showed trust in the efficacy and safety of the vaccine against COVID-19.

Conclusion: The majority of the HCPs from the COVID-dedicated hospitals have a good perception and positive attitude towards vaccination; nevertheless, have a poor practice of prevention toward COVID-19. This may play a vital role in motivation and wide acceptance of vaccine among the general population and contribute in comprehensive strategic planning to fight back against the pandemic in the country with the restricted resource.

Keywords: perception, practice, attitude, transmission, prevention, COVID-19, healthcare professionals, Bangladesh

Introduction

Nearly one and half years have passed world has fought against the COVID-19 pandemic with more than 173 million confirmed cases and 3.7 million deaths reported worldwide up to the first week of June, 2021.[1] Many countries including Bangladesh fight with second wave with a new variant of coronavirus more intensely with 809,314 confirmed cases and 12,801 deaths.[2] Safe and effective vaccination is the only way to reduce mortality and slow this pandemic situation, but the eradication of COVID-19 appears to be virtually impossible, however, with

a great trial and efforts of researchers, based on the WHO and CDC report, understanding its clear mode of transmission and taking appropriate preventive measures are the most essential and life-saving strategies for controlling the disease. Social isolation, appropriate face mask usage, following rules of social distancing, and proper handwashing practice or sanitization are among the most frequently recommended intervention measures. However, the US Food and Drug Administration (FDA) and the European Medicines Agency (EMA) set a cutoff of 50% as the efficacy required to approve a COVID-19 vaccine. Around 67% of efficacy against the COVID-19 vaccine may be enough to slow the spread of pandemic.[3] Usually, the vaccine development process is slow and needs a brief period to go through rigorous checks for potency, efficacy, and safety, particularly in human trials (phase-II and phase-IV). But the launch of the COVID-19 vaccine was an accelerated program. From the very first day of this pandemic to date 66 vaccine candidates are in the clinical trial and 20 are in Phase III trials and trials for four other candidates were reported.[3] In Phase III trials, several vaccines demonstrate efficacy as high as 95% in preventing symptomatic infections. The efficacy rate ranged from 62% to 96% for different vaccine-products against COVID-19, and it took the vaccines to go to market merely nine months after the discovery of the virus.[4]

Healthcare professionals are at the frontline of the COVID-19 pandemic response and are more vigorously exposed in a densely populated country to threats like frequent exposure to organisms, long working hours, psychological distress, fatigue, occupational burnout, social stigma, and physical violence. A poor understanding of the disease among HCPs can result in delayed identification and treatment leading to the rapid spread of infections. Reasonably, the acceptance of the new vaccine remains uncertain by both, healthcare professionals (HCP) and the citizens at large.[5] From the beginning of the COVID-19 pandemic, HCP are working in the front line, despite the higher risk of getting infected and die. They do their professional work with a fear of becoming infected not only with them but also with their patients and family members.[6] Besides, HCP are the key source of information for vaccines, and their communication among patients and communities, which is a part of their professional duty, can accelerate vaccination recommendations.[7] Several threats were detected according to the COVID-19 vaccine implementation, even among the HCP.[8] Health professionals are more sensible in their consumption of

information. HCP who worked in the front line thought that they have developed protective antibodies due to infected multiple times with the virus.[9] But the longevity and effectiveness of the immune response after the vaccination remained unresolved in the RCTs.[10] Above all of that, the accelerated development and approval of the COVID-19 vaccine still questionable among HCPs. Over their safety, which has an immense impact on the general public's decision.[11–13] Many countries around the world have prioritized HCPs to be the first to receive the vaccine. But in several regions like Ohio state, 60% of nursing-home staff refused to take the vaccine, in New York, 30% of HCPs turn it down.[14,15]

There is a paucity of literature on perception, practice and attitude of HCPs toward the COVID-19 pandemic. However, studies on South Asian HCPs and medical students revealed that they had insufficient knowledge about COVID-19 but had a positive attitude toward the prevention of transmission of the COVID-19. To our knowledge, no study has been done in Bangladesh including doctors, nurses, and MLSS (ward boy, cleaner, medical technicians) at the COVID-dedicated hospitals. Considering all those consequences and changeable perceptions of HCPs, this multi-center cross-sectional descriptive study is the first to reveal the basic perception of symptoms. Transmission, preventive measures, practice of prevention, and attitudes towards vaccine among different categories of HCPs serving in COVID-dedicated hospitals in Dhaka, Bangladesh, a low-middle income country containing the pandemic successfully in the region with limited health-care facilities and manpower.

Methods
Study Design
This was a multi-center cross-sectional descriptive study.

Setting and Subjects
The study was carried out at Holy Family Red Crescent Medical College Hospital (HFRCMCH), a 252-bed non-government hospital, and Sheikh Russel National Gastroliver Institute and Hospital (SRNGIH), a 250-bed government hospital in Dhaka, Bangladesh from February 5, 2021, to March 7, 2021, using a convenience sampling method. Both the study centers were tertiary care hospitals designated as COVID-dedicated during the study period of the pandemic. Inclusion criteria: All healthcare professionals (HCPs) – doctors, nurses, and members of

lower subordinate society (MLSS), who were serving at the study centers during the study period and consented voluntarily. Exclusion criteria: HCPs who were not regular staff at the study centers; and those who refused to participate in the study.

Sample Size

The sample size of this study was determined by applying a sample size formula to estimate a single proportion, with a confidence level (CI) of 95%, the margin of error of 2%, an average study population of around 630 HCPs an estimated dropout rate of 20%, resulting in at least 504 participants were necessary. However, a total of 583 HCPs agreed voluntarily and 550 completed the questionnaire, and 26 HCPs of different categories were excluded for the pre-testing and face validation of the questionnaire and their responses were not included in the study results. As a result, the original sample size calculated in this study was 524 participants to maximize the validity, representability, and generalizability of the HCPs.

Study Instrument

Data were collected through a pre-tested and validated questionnaire developed by the authors after comprehensive reviews of the currently available published studies. The questionnaire was pre-tested for clarity, length, and face validity in two hospitals among a separate group of HCPs not included in the study. The questionnaire consisted of 4 main parts: (1) Socio-demographic data (2) Perception about symptoms, transmission, and prevention of COVID-19 (3) Practice towards COVID-19 prevention, and (4) Attitude towards vaccination against COVID-19. The first part of the survey investigated socio-demographic-related information on the HCPs. The second part of the questionnaire examined the respondents' perception, which was defined by three sub-components, namely symptoms, transmission, and prevention of COVID-19 precautionary measures. There were 15 true/false/do not know questions to gather information about the respondent's level of perception. Each item was counted as +1 if the respondents chose the correct answer and 0 for the unsure answer, and −1 for the wrong answer giving it a total score of −15 to +15. The perception was defined as "wrong" if the total score was −15 to 0, "low" or insufficient if the score was 0 to 9 points, corresponding to less than 60%; "moderate" or sufficient if the total score ranged 10–12 (60–80%); and "high" if the total score was 12 to 15 (80–100%). In section three, 5 questions with always/sometimes/never were employed to measure

HCPs' practice of prevention. The correct answer received a +1 point while the wrong one received −1, resulting in a total score ranging from −5 to +5. The practice was determined to categorize as "poor" if the total score was −5 to 0, "fair" if the score was 1 to 3, corresponding up to 60% correct responses, and "good" if the total score was 4 to 5, corresponding to more than 80% correct response of preventive practices. The fourth part of the questionnaire with 5 questions on attitude towards vaccination with true/false/do not know were employed to measure HCPs' attitude towards vaccination. The correct answer received +1 point whiles the wrong one received −1, resulting in a total score ranging from −5 to +5. The Attitude was determined to categorize as "negative" if the total score was −5 to 0, "neutral" if the score was 1 to 2 (20–50%), and "positive if the total score was 3 to 5 corresponding to more than 60% correct responses.

The first draft version of the questionnaire was sent to three experts in medicine, public health, and epidemiology to evaluate the internal consistency of the sections and check on their clarity, validity, and acceptable reliability. Then, 26 potential respondents from different categories were asked for their opinion as the questionnaire was translated into the local language (Bengali) for better understanding.

Data Collection

All the eligible HCPs at HFRCMCH and SRNGIH centers were reached and informed about the research purpose and other relevant information to obtain their informed consent and enrolled voluntarily in the study.

Data Analysis

Collected data were organized and analyzed using SPSS Statistics for Windows, version 23.0. The mean, standard deviation (SD), frequency, and proportion were used to display demographic characteristics. Meanwhile, statistically significant differences in perception, practice, and attitude towards vaccination against COVID-19 were examined by post hoc test using one-way ANOVA with $p < 0.05$ being the value of statistical significance. Chisquire was also done to compare the frequency of correct responses to observe any differences among the categories of HCPs.

Results

Out of 630 HCPs being approached, 583 (92.53%) voluntarily agreed and were included in the study. Then, 550 completely fulfilled questionnaires were collected and analyzed,

Table 1 Demographic Characteristics of the Study Subjects According to Age and Category

Age	Centers	Total (n= 524)	Doctor (n= 240)	Nurse (n=146)	MLSS (n= 138)
0–19	HF (n=316) SR (n=208)	– 09 (4.33%)	– –	– –	– 09/ 208 (4.33%)
	Total	09 (1.72%)	–	–	09/524 (1.72%)
20–39	HF (n=316) SR (n=208)	150 (47.47%) 170 (81.73%)	117/187 (62.57%) 31/53 (58.49%)	12/72 (16.67%) 71/74 (95.94%)	21/57 (36.84%) 68/81 (83.95%)
	Total	320 (61.07%)	148/240 (61.66%)	83/146 (56.85%)	89/138 (64.49%)
40–59	HF (n=316) SR (n=208)	159 (50.31%) 29 (13.94%)	64/187 (34.2%) 22/53 (41.51%)	59/72 (81.94%) 03/74 (4.05%)	36/57 (63.16%) 04/81 (4.94%)
	Total	188 (35.88%)	86/240 (35.83%)	62/146 (42.46%)	40/138 (28.98%)
> 60	HF (n=316) SR (n=208)	07 (2.21%) –	06/187 (3.21%) –	01/72 (1.39%) –	– –
	Total	07 (1.33%)	06/240 (2.5%)	01/146 (0.68%)	–
Male: Female	HF (n=316) SR (n=208)	118: 198 (1:1.67) 86: 122 (1:1.41)	75: 112 (1:1.49) 36: 17 (1:0.47)	03:69 (1:23) 03:71 (1:23.66)	40:17 (1:0.42) 47: 34 (1:0.72)
	Total	204: 320 (1:1.33)	111: 129 (1:1.61)	06: 140 (1:23.3)	87: 51 (1: 0.58)

equivalent to an overall response proportion of 95.27%. Thirty-three respondents did not complete the questionnaire or inappropriate responses and 26 respondents were excluded for the pre-testing and face validation. The age range of the respondents was 18 to 64 years with the mean 36.17 ±10.94 years. Table 1 shows the demographic information of 524 HCPs, of which 316 (60.3%) respondents were from the HF-center and 208 (39.7%) from the SR-center. The majority of the respondents were female 323 (61.6%) and 201 (38.4%) were male.

Perception About COVID-19

Table 2 shows the findings on the respondents' perception of COVID-19. Almost all participants had "high" or more than sufficient perception (94.34%) about the symptoms of COVID-19. Additionally, there was a low proportion of responses with "moderate" or just sufficient perception (80.49%) about the transmission of disease, but "high" perception (89.34%) about prevention of the disease, respectively. Out of 15 items measuring the perception of the participants, almost all statements had their correct response rate of more than 88% about symptoms, more than 79% about transmission, and more than 86% about prevention. In contrast, only 44.66% could give a correct response when being asked "Contact or ingestion of wild animals may cause

transmission of COVID-19" and 70.80% to the "General medical mask can protect from COVID-19". There were no significant differences in the rate of correct responses among different categories of HCPs.

Practice of Prevention

Table 3 shows the results regarding the patients' practices towards COVID-19 preventive action. This section had overall good practice (69.65%) and most of the respondents (93.88%) used protective mask whenever went out of home or attended COVID-19 patients. But all categories of HCPs expressed their poor or fair practice about restraining from shaking hands, and only 6.84% of nurses, 8.33% doctors, and 11.59% of MLSS avoided crowded public gatherings as a practice of prevention.

Attitude Towards Vaccination

The attitudes of participants towards vaccination against COVID-19 are presented in Table 4, the majority (95.99%) HCPs showed positive attitudes about availability of vaccine free of cost, and 87.40% showed trust in the efficacy and safety of the vaccine against COVID-19. Again almost half of the respondents from the MLSS category (56.52%) showed uncertainty on COVID-19 vaccine's efficacy and safety because of emergency development within pandemic, and 52.17% of respondents preferred natural immunity by

Table 2 Frequency Distribution of Correct Responses of HCPs on Perception Towards COVID-19

Questions on Perception		Doctors (n=240)	Nurses (n=146)	MLSS (n=138)	Total (524)	p-value
Symptoms	Cough	232 (96.67%)	144 (98.63%)	136 (98.55%)	512 (97.71%)	
	Fever	238 (99.16%)	146 (100%)	134 (97.10%)	518 (98.85%)	X^2=1.3152 p=0.999936
	Sore throat	234 (97.50%)	140 (95.89%)	133 (96.38%)	507 (96.75%)	
	Diarrhea	201 (83.75%)	134 (91.78%)	129 (93.48%)	464 (88.55%)	
	Myalgia	208 (86.66%)	138 (94.52%)	125 (90.58%)	471 (89.88%)	
Transmission	COVID-19 has no specific remedy, symptomatic treatment can cure most of the cases	235 (97.92%)	139 (95.21%)	136 (98.55%)	510 (97.33%)	
	All patients do not get critical, only the elderly suffering from co-morbidities may become serious	203 (84.58%)	117 (80.14%)	132 (95.65%)	452 (86.26%)	X^2=19.8358 p=0.070257
	Contact or ingestion of wild animals may cause transmission of COVID-19	121 (50.42%)	71 (48.63%)	42 (30.43%)	234 (44.66%)	
	COVID-19 patients cannot spread the virus if no fever is present	221 (92.08%)	117 (80.14%)	80 (57.97%)	418 (79.77%)	
	The virus can be spread through droplets and sneezing of the infected person	230 (95.83%)	137 (93.83%)	128 (92.75%)	495 (94.46%)	
Prevention	Children and young adults do not require any preventive measure	228 (95%)	130 (89.04%)	97 (70.29%)	455 (86.83%)	
	Everyone needs to avoid the crowd (bus-station, public transport, market) to prevent COVID-19	233 (97.08%)	146 (100%)	116 (84.06%)	495 (94.46%)	
	Quarantining the infected persons will reduce the spread of the COVID-19	238 (99.17%)	141 (96.57%)	126 (91.30%)	505 (96.37%)	X^2=7.7329 p=0.805642[ns]
	Person who comes in contact with COVID-19 patient have to remain quarantine for 14 days	235 (97.92%)	145 (99.31%)	135 (97.83%)	515 (98.28%)	
	General medical mask can protect from COVID-19	165 (68.75%)	99 (67.81)	107 (77.54%)	371 (70.80%)	

Note: X^2 means the value of Chi Square test.
Abbreviation: NS, not significant.

Table 3 Frequency Distribution of Correct Responses of HCPs on Practice

Questions on practice		Doctors (n=240)	Nurses (n=146)	MLSS (n=138)	Total (524)	p-value
Practice	Have never been in crowded public gathering currently	20 (08.33%)	10 (6.84%)	16 (11.59%)	46 (08.78%)	
	Have used mask whenever attended any patients currently	224 (93.33%)	142 (97.26%)	131 (94.92%)	497 (94.85%)	
	Have restrained from shaking hands Currently	192 (80%)	113 (77.39%)	91 (65.94%)	396 (75.57%)	X^2=18.2673 p=0.107811[ns]
	Have cleaned hands before and after attending every patients currently	141 (58.75%)	141 (96.57%)	113 (81.88%)	395 (75.38%)	
	Have used mask whenever went out of the home	222 (92.50%)	141 (96.57%)	128 (92.75%)	491 (93.70%)	

Note: X^2 means the value of Chi Square test.
Abbreviation: NS, not significant.

Table 4 Frequency Distribution of Responses of HCPs on Attitude Towards Vaccination

Questions on Attitude		Doctors (n=240)	Nurses (n=146)	MLSS (n=138)	Total (524)	p-value
Vaccination	In favor of vaccine against COVID-19, because it is effective and safe	203 (84.58%)	124 (84.93%)	131 (94.92%)	458 (87.40%)	X^2=22.2356 p=0.034963
	Vaccine against COVID-19 is available free of cost	231 (96.25%)	142 (97.26%)	130 (94.20%)	503 (95.99%)	
	Children do not require to get COVID-19 vaccination	79 (32.92%)	57 (39.04%)	68 (49.27%)	198 (37.78%)	
	Do not rely on COVID-19 vaccine due to emergency development during pandemic	186 (77.50%)	104 (78.23%)	78 (56.52%)	368 (70.23%)	
	Vaccination is not required because immunity will be acquired naturally by infection	193 (80.42%)	96 (65.75%)	72 (52.17%)	361 (68.89%)	

Note: X^2 means the value of Chi Square test.

infection rather than vaccination for immunity. While most of the HCPs showed a neutral attitude about "children do not require to get COVID-19 vaccination". Overall only 37.78% of HCPs thought the vaccine was not required for children.

Score on Sufficient Perception, Good Practice and Optimistic Attitude

The mean score of perception (11.17) out of 15 points, practice (3.16) and attitude (2.88) out of 5 points was found significantly ($p < 0.001$) lower among the MLSS, and overall score in all three domains of the study was higher among doctors followed by nurses as shown in Table 5. Statistically highly significant differences ($p < 0.001$) were observed within the categories of HCPs comparing perception about COVID-19 between doctors versus MLSS, and nurses versus MLSS, not between doctors versus nurses. However, there were no significant differences of mean score in practice of prevention, and attitude towards vaccination among the HCPs in Table 6 with 95% confidence interval.

Discussion

This is the foremost study of its type to assess the perception and practice towards COVID-19 and attitude towards vaccination of frontline healthcare professionals in Bangladesh, and it was performed during the second wave of the pandemic. The characteristics of participants in this study were mainly female (61.6%) with the male: Female ratio was 1:1.33 and nearly half of the total respondents were doctors (45.8%). Perception about symptoms, transmission, and prevention of COVID-19 varied across different categories of HCPs. Out of 524 HCPs, 94.34% had a high perception about symptoms of COVID-19, but moderate perception about the transmission (80.49%) that was comparatively lower than that of previously published study from Ethiopia,[16] Uganda[17] and Nigeria,[18] Egypt[19] and Nepal.[20] However, the perception of preventive measures was high (89.34%) among our respondents which might be for the increment of knowledge, experience, and access to information since the first wave of COVID in the country.

The present study showed the HCPs in Bangladesh had a comprehensive and high perception or more than sufficient knowledge about symptoms of COVID-19 except for diarrhea and myalgia. The mean score of perception was high among the doctors and nurses, whereas a lower score (11.17 ± 2.10) was found among the significantly different

Table 5 Mean Scores of Knowledge, Practice and Attitude Among the HCPs

Mean Scores	Doctors	Nurses	MLSS	Difference Between Groups	
				F	P
Score of perception (15)	12.50 ±2.05	12.34 ±1.62	11.17 ±2.10	21.61	< 0.001
Score of practice (5)	3.43 ±1.57	3.40 ±1.43	3.16 ±1.35	1.55	0.213
Attitude towards vaccination (5)	3.03 ±1.85	3.04 ±1.51	2.88 ±1.65	0.44	0.643
Overall total score	18.95 ±3.69	18.78 ±2.84	17.20 ±3.59	12.23	< 0.001

Note: Post hoc test using one-way ANOVA.

Table 6 Comparison of Score Between the Categories of HCPs

	Occupation Group (I)	Occupation Group (J)	Mean (I-J) Difference	Std. Error	p-value	95% CI	
						Lower Bound	Upper Bound
Score of perception	Doctor	Nurse	0.160	0.206	0.436	−0.24	0.56
		MLSS	1.329	0.209	<0.001*	0.92	1.74
	Nurse	Doctor	−0.160	0.206	0.436	−0.56	0.24
		MLSS	1.169	0.233	<0.001*	0.71	1.63
	MLSS	Doctor	−1.329	0.209	<0.001*	−1.74	−0.92
		Nurse	−1.169	0.233	<0.001*	−1.63	−0.71
Score of practice	Doctor	Nurse	−0.008	0.180	0.966	−0.36	0.35
		MLSS	0.157	0.183	0.392	−0.20	0.52
	Nurse	Doctor	0.008	0.180	0.966	−0.35	0.36
		MLSS	0.164	0.203	0.419	−0.23	0.56
	MLSS	Doctor	−0.157	0.183	0.392	−0.52	0.20
		Nurse	−0.164	0.203	0.419	−0.56	0.23
Score of attitude towards vaccination	Doctor	Nurse	0.021	0.155	0.893	−0.28	0.33
		MLSS	0.266	0.158	0.093	−0.04	0.58
	Nurse	Doctor	−0.021	0.155	0.893	−0.33	0.28
		MLSS	0.245	0.176	0.164	−0.10	0.59
	MLSS	Doctor	−0.266	0.158	0.093	−0.58	0.04
		Nurse	−0.245	0.176	0.164	−0.59	0.10

Notes: *The mean difference is significant at the 0.05 level. Post hoc test using one-way ANOVA.

MLSS (p <0.001) from the rest of the HCPs. Most of the respondents had low perception on a particular question about transmission 'contact or ingestion of wild animals may cause transmission of COVID-19'. Only 44.66% of the respondents could answer correctly. However, the overall perception on the transmission of the disease was good, and a higher rate of correct answers compared to the studies among HCPs in India (61%) due to inadequate dissemination of information and misunderstanding among HCPs delayed applying preventive efforts as reported by Kumar et al.[21] The perception of transmission was also reported low among the HCPs in Vietnam (67%) that might because of the survey performed in the early period of the pandemic in Ho Chi Minh City, and more interest of HCPs in social media than official websites as reported by and Giao et al.[22] In terms of perception and

knowledge about prevention, more than 86% of participants presented appropriate answers on COVID-19 control and prevention. Although 70.80% of the HCPs believed that 'general medical mask can protect from COVID-19'.

The provision of information to the community about the virus, its transmission modes, and necessary protective measures played a vital role in controlling the pandemic. The practice of prevention against COVID-19 was good among 69.65% HCPs in our study. However, only 58.75% of doctors "cleaned hands before and after attending every patient" and only 65.94% of MLSS 'have restrained from shaking hands. The overall practice of prevention of the participants was higher than the studies in Ethiopia (59.6%),[16] but much lower than the findings Uganda (74%)[17] and China (89.7%).[23] Washing hands, wearing a mask, social distancing as a part of good practice of

prevention by HCPs were reportedly high in the studies from Nigeria, Nepal, and China.[18,20,23] Alarmingly, all three categories of HCPs had poor practice about "avoiding crowded public gathering" ranging from nurses 6.84%, doctors 8.33%, and MLSS 11.59% respectively in the present study. This might be due to the lack of strict enforcement of lockdown, low transmission rate, and mortality rate reported in Bangladesh during the study period. However, the mean score of practice was similar among the different categories of HCPs and no statistical difference was observed.

This study also revealed a great proportion of participants having positive attitudes towards vaccination against COVID-19. Almost 95.99% of HCPs showed positive attitudes about availability, efficacy, safety, and necessity of vaccination. Although 56.52% of MLSS "do not rely on vaccine due to emergency development during pandemic". Our study revealed the positive attitude towards acceptance of vaccine against COVID-19 and was much higher than the HCPs in France (81%), Greece (78.5%), Israel (78%).[24–26] This observation was similar to the findings of the Asia-pacific study conducted on 1720 healthcare workers from 6 countries: China, India, Indonesia, Singapore, Vietnam, and Bhutan.[27] However, a significant difference ($p < 0.034$) in the rate of correct answers about a positive attitude towards vaccines was observed among the different categories of the HCPs in our study. But the mean score on a 5-point scale was not significant as only 37.78% of the participants believed "children do not require to get COVID-19 vaccination".

Limitations

Although COVID-19 related scientific information has gained great interest among the researchers, there is a lack of studies conducted on frontline HCPs inclusive of doctors, nurses, and support staff in COVID-dedicated hospitals, particularly in Bangladesh. Therefore, it is perplexing to find adequate literature serving as references for this type of study. The questionnaire used in this study was structured on a restricted number of relevant publications available as references, and adopted according to the understanding of the local HCPs and translated in Bengali resulting in a not quite high global standard. Additionally, information bias was inescapable due to the nature of its self-answering questionnaire.

Conclusion

The findings of the present study suggested that the majority of the HCPs participated in the study from the COVID-

dedicated tertiary care hospitals have good perception about symptoms, transmission, and prevention; nevertheless, have a poor practice of prevention toward COVID-19. Doctors, nurses, and MLSS were much aware of the wearing of a mask, hand washing, and social distancing, but rarely avoided crowded public gatherings. Since the limitation of crowded gathering is a critical step to prevent community transmission, maximum emphasis should be given to improve preventive measures by hospital management and the Government to safeguard the HCPs against a densely populated country with resource constraints. However, most of the frontline HCPs have a very positive attitude toward vaccination that may play a vital role in motivation and wide acceptance of vaccine among the general population for the attainment of successful nationwide vaccination program in Bangladesh despite the severity of COVID-19 in many regions around the world.

Strengths

The study was conducted on HCPs who were serving closely at the leading tertiary care hospitals dedicated to the COVID-19 management in the capital city, Dhaka, Bangladesh. The study centers were a national tertiary general hospital with a variety of patients from many regions across the country seeking medical examination and treatment for COVID-19 during the pandemic. Therefore, the respondents in this study were representative of the Bangladeshi HCPs with a nationwide network, reference, integrated with information, infection control prevention strategy, and national guideline for treatment. Moreover, the questionnaire used to collect data was structured and adopted with careful and thorough referencing from previous studies, and also guidelines by WHO and the Government of Bangladesh, to maximize the accuracy and relevance of the questionnaire to the current context of COVID-19.

Ethical Approval

The study was conducted in compliance with the Declaration of Helsinki. Ethical approval was obtained from the Institutional Ethics Review Board of Holy Family Red Crescent Medical College, and Sheikh Russel National Gastroliver Institute and Hospital; Dhaka, Bangladesh before proceeding with data collection (Approval No: IERB/34/Sur/Feb/2021/10/hf). Additionally, the participants responded to the questionnaire anonymously with no identifying information required.

Author Contributions

All authors made a significant contribution to the work reported, whether in conception, study design, execution, acquisition of data, analysis, interpretation, or all those areas; took part in drafting, revising, or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors declare no conflict of interest for this work.

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