Original Article

KNOWLEDGE AND CONSPIRACY BELIEF OF HEALTHCARE PROFESSIONALS ON HUMAN MONKEYPOX VIRUS: A CROSS-SECTIONAL STUDY IN A TERTIARY HOSPITAL OF BANGLADESH

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ABSTRACT

Background: Since early May 2022, the unprecedented outbreak of human monkey pox (HMPX) has been documented globally which demands assessment of knowledge on the emerging viral infection as well as the state of conspiracy belief among the healthcare professionals. The present study aimed to assess the knowledge about HMPX and its relation to conspiracy belief.

Methods: This cross-sectional study was conducted at the Combined Military Hospital Dhaka (CMH) among purposively selected 254 healthcare professionals from July 2022 to September 2022. Data were collected through face-to-face interview using a pre-tested semi-structured questionnaire with validated and reliable tools.

Results: The study comprised a total of 254 respondents, including 53.9% male, 72.8% respondents having a graduate degree and 42.9% individuals aged between 26-30 years. The study revealed very poor (61.8%) knowledge on HMPX as well as higher (50.4%) belief in conspiracy theory among the respondents. The hierarchical logistic regression revealed that male had significantly higher (B=1.12, OR 3.06, 95% CI=1.714-5.463) knowledge on HMPX virus than that of the female, age group <31 years emerged as a negative and significant predictor than that of the age group >31 years (B= -1.065, OR 0.345, 95% CI=0.172-0.690), monthly income of between 60001-90000 taka also emerged as a positive and significant predictor than that of the income of >90001 taka (B=0.763, OR 2.145, 95% CI=1.002-4.595).

Conclusion: The study findings demand intervention of appropriate health educational program in the medical study curriculum.

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INTRODUCTION

Since early May 2022, the world experienced an unprecedented outbreak of monkey pox with the first cases initially described in the United Kingdom which was followed by other countries of Western Europe, as well as North and South America, the Middle East and North Africa and Australia.[1] Monkeypox is smallpox caused by infection with zoonotic orthodox virus which cause severe clinical disease, with abnormal systemic signs and symptoms. Human infection was first described in Central Africa in 1970.[2] The disease is caused by the monkeypox virus (MPXV) classified in the genus *Orthopoxvirus* within the family *Poxviridae* which is a large and diverse family of double-stranded DNA viruses that multiplies in the cytoplasm of the infected cells.[3-4] In the year 1980, when the smallpox was eradicated from the world, human monkeypox (HMPX) was described in 1987 as the most important *Orthopoxvirus* (OPXV) occurring in humans at the time. Though MPXV was first discovered at a Danish laboratory in 1958 during an outbreak amongst monkeys, it was not recognized as a human disease until 1970, when a nine-month-old child became infected in Democratic Republic of Congo (DRC), formerly known as Zaïre. MPX is typically found in the tropical rain forests of the Congo

basin (CB) and West Africa (WA), and DRC continues to report the majority of cases each year mainly among the children under 10 years of age.[5] The incubation period of infection until the onset of symptoms is usually 6-16 days. The main clinical picture of the monkeypox is similar to smallpox which include fever, headache, lymphadenopathy, back pain, muscle aches, and weakness. Skin rashes appear on the face then spread to other body parts. This rash develops from red spots such as smallpox, blisters filled with clear fluid, pus-filled pus, then hardens. It usually takes up to 3 weeks for the rash to disappear. Infections in cases of monkeypox occur due to direct contact with blood, body fluids, or skin or mucosal lesions in infected animals. Secondary transmission, or from human to human, can occur due to direct contact with mucus from an infected person's respiratory tract, infected skin lesions or objects that have recently been contaminated by fluid coming out of the patient's body or from wounds [2]. Since 2016, cases have appeared in the Central African Republic, Liberia, Nigeria, and Sierra Leone. In 2017, the largest outbreak of monkeypox was reported in Nigeria with 197 suspected cases and 68 confirmed cases. The first monkeypox case in Asia was reported in Singapore, in May 2019, when a tourist from Nigeria who attended a conference was confirmed positive for MPXV.[6]

Occurrence of newly appeared emerging and re-emerging viral infection not only causes unexpected illness and epidemics among humans, wildlife and livestock but also stretched the local and national health resources, thereby affecting the public health constantly and relentlessly.[7] "Emerging infectious disease" is a term used to describe previously unknown or known infectious diseases that have the potential to cause outbreaks which include those caused by pathogens that are already present in the environment but previously did not cause infection or evolve a selective advantage for infection in a new host species.[8] The outbreak of several emerging and re-emerging infectious diseases was experienced by the global community during the last decades with high threats to the health security, biodefense, and economy worldwide. It is very certain that after the onset of new infectious agents in a certain geographic area for the first time, very little or no knowledge about that virus regarding its identity, epidemiology and pathogenesis was seen in most of the cases.[9] At the same time, it has been observed that due to several misconceptions, misperception and stigma about the newly appeared pandemic, the general people have a tendency to embrace different conspiracy theory regarding that pandemic. Likewise, conspiracy theory was proliferated after the onset of COVID-19 and monkey pox pandemic. Among the several theories,

most prevalent theory includes either that COVID-19 is part of a government bioweapons program, 5G cell towers are spreading COVID-19, and pharmaceutical companies are encouraging the spread of COVID-19 for profit and so on. By now it is being established that the significant events as secret plots invented by powerful and malicious institutions, groups, and/or people are called the conspiracy theory. Evidence suggests that belief in conspiracy theories undermines engagement in pro-health behaviors and support for public health policies, including within the contexts of previous disease outbreaks, such as Ebola, COVID-19 and very recent outbreak of Monkeypox virus.[10]

Lack of appropriate knowledge on HMPX poses challenges to prevent the re-emergence of the disease.[11] Rapid spread of rumors about the disease is one of the main challenges in controlling the ongoing outbreak. The rumors and misinformation regarding HMPX viral disease that are spread through social media and various online platform are COVID-19 vaccination is linked to the outbreak, Microsoft co-founder and billionaire Bill Gates has a role in the outbreak and governments falsely augment the fears about the disease. To change the attitudes and behavior of the mass population regarding the rumor and misinformation of HMPX, tackling knowledge can be the first step to consider which will be associated with a greater influence on this attitude and behavior. For appropriate preparedness and willingness to work during the outbreak of HMPX pandemic, assessment of knowledge level among the healthcare professionals is necessary. In addition, the assessment of the relation between disease knowledge and attitude towards conspiracy beliefs can have implications on the understanding of health-seeking behavior, including the likelihood to adhere to preventive measures such as vaccination. Furthermore, now a days wide availability of social media and internet access allows the healthcare professionals for being contaminated with online rumors and conspiracies.[3] The increased number of human monkeypox cases demonstrates the importance of prevention, early detection, and quick response and management from healthcare workers. However, a report by World Health Organization (WHO) showed that one of the challenges faced in preventing the reemergence of monkeypox was a lack of knowledge of monkeypox, particularly among healthcare workers. Although monkeypox has yet to be reported in Bangladesh, it is crucial for healthcare workers to be knowledgeable and prepared for monkeypox cases since lots of tourist or foreign visitors visit Bangladesh very frequently which could increase its vulnerability to the importation of human monkeypox. At the same time, till today one nationwide study regarding knowledge

on HMPX viral infection among the general population is being conducted by Nath SD *et al.,* where no healthcare professionals were included let alone the determinants of knowledge and its relation to conspiracy belief. As such, the study was aimed to find out the determinants of knowledge about HMPX viral infection and its relation to conspiracy beliefs among the healthcare professionals working at CMH Dhaka.

METHODS
This cross-sectional study was conducted among conveniently selected 254 healthcare professionals (Doctors) of Combined Military Hospital (CMH) Dhaka from July 2022 to September 2022 with an aimed to find out the determinants of knowledge about HMPX and its relation to conspiracy belief. Irrespective of sex and age, all the healthcare professionals either permanently/temporarily posted or trainee student of CMH Dhaka and willing to participate voluntarily were included. Data were collected from the respondents through face-to-face interview using pretested semi-structured questionnaire adopted and customized from the questionnaire previously used by [3,6]. Prior to data collection, written informed consent were obtained from the respondents. Ethical approval for the study was granted by the ethical committee of CMH Dhaka with the number 45/06/2022 and neither any intervention nor invasive procedure were given. The questionnaire consisted of socio-demographic information like age, gender, marital status, educational qualification (graduate/post-graduate), monthly family income etc. Information related to work place characteristics like pattern of job, length of service, duration of service at the present workplace, attendance of any conference/seminar/symposium/workshop (Local, international or regional) etc. To assess the knowledge on human monkey pox viral infection, a questionnaire consisting of 22 multiple choice questions which was previously used by Sallam M. *et al.,* and Harapan H. *et al.,* was adopted and customized for our study. The possible responses to each knowledge item were (yes vs. no vs. I do not know). Correct responses were scored as 1, incorrect responses were scored as −1, and "I do not know" was given a score of zero, which were used as a sum to represent the monkeypox knowledge score (MPX K-score). Poor level of knowledge per item and for the overall assessment was defined at a 60% correct responses level i.e., whoever scored either 14 and above was considered as having good knowledge on HMPX virus. To assess the level of conspiracy belief regarding emerging viral infection, we adopted survey items from the emerging virus

infections conspiracy scale (EVICS) previously used by Sallam M. *et al.,.*[3] Items are scored on a 7-point Likert scale ranging from 1-7, where 1 is strongly disagree, 2 is disagree, 3 somewhat disagree, 4 is neutral, 5 is somewhat agree, 6 is agree and 7 is strongly agree. The sum of the item scores were ranges from 7–84. Higher EVICS scores (more than mean) indicated a higher embrace of conspiracy beliefs regarding virus emergence. The internal consistency of EVICS was ensured by a Cronbach's alpha value of 0.901. Data processing and analyses were performed using the Statistical Package for Social Sciences (SPSS) version 23 for Windows. Frequencies, percentage, mean and standard deviation (±SD) were used for descriptive statistics. Associations of explanatory variables and HMPX knowledge or conspiracy beliefs regarding emerging virus infections were evaluated using the chi-squared test ($\chi 2$) or the two-tailed Mann–Whitney U test (M-W) as appropriate. Logistic regression analysis was used as appropriate. A two-tailed $p<0.05$ was considered statistically significant.

RESULTS
Among the respondents, almost half of the respondents (42.9%) belong to the age group 26-30 years with average (±SD) age of 30.54 (±6.36) years and range was 22 to 55 years, 53.9% of them were male and 89.4% were Muslim. Highest (72.8%) were having a graduate degree and 62.6% were married. About one-third (34.6%) of the respondents had monthly income of >90001 taka with average (±SD) of 83740.16 (±57456.80) Taka. Minimum monthly family income was 10000 and maximum was 250000 Taka. Majority (74.0%) of the respondents belonged to the nuclear family and 80.3% were non-smoker.

Almost half (45.3%) were permanently posted to the CMH Dhaka which was followed by trainee respondents (33.1%). Near about half (39.0%) of the respondents had the length of service <1 years. The average (±SD) length of service was 5.23 (±5.75) years. About 44.9% of the respondents is posted to CMH Dhaka for more than 2 years with average (±SD) duration of posting was 2.55 (±4.36) years. About 66.5% of the respondents did not participate in any sorts of seminar, symposium or workshop in the last six months. Among the 254 respondents, 88.2% were heard about the HMPV and 40.6% had informed about the virus during their student life. Fifty-nine percent of the respondents informed about the HMPX for few months before and 21.3% of the respondents can't remembered about the HMPX infection. Majority of the respondents informed about HMPX from medical journals which was followed by online source.

The overall level of knowledge regarding human monkey pox was poor (61.8%) and the rest (38.2%) having good knowledge on HMPX [Figure 1].

Figure 1: Distribution of Monkey pox knowledge score among the respondents (n=254)
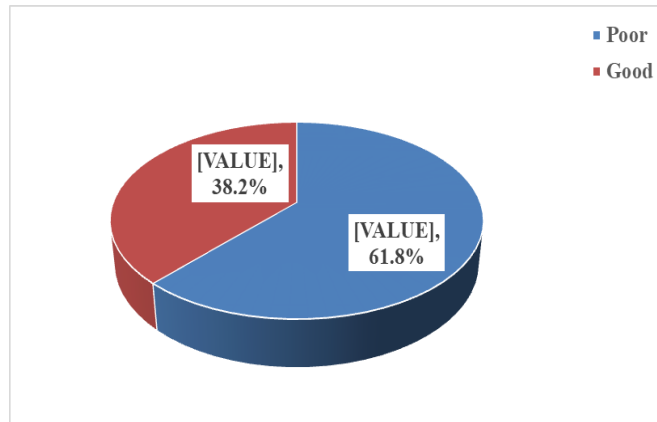
In regards to the item wise distribution of the knowledge question among the respondents, it was revealed that majority of the respondents could answer correctly regarding geographical distribution of the monkeypox (72.0%), nature of the organism (68.5%) etc., at the same time poor knowledge revealed in case of mode of transmission of monkeypox (37.0%) [Table 1].

Table 1: Distribution of healthcare professionals by item wise knowledge (n=254)

HMPX knowledge item	Response		
	Yes n (%)	No n (%)	I don't know n (%)
Monkeypox is prevalent in Southeast Asia countries	149 (58.7)	55 (21.7)	50 (19.7)
Monkeypox is prevalent in Western and Central Africa	183 (72.0)	23 (9.1)	48 (18.9)
There are many human monkeypox cases in Bangladesh	154 (60.6)	24 (9.4)	76 (29.9)
There is an outbreak of human monkeypox in our neighboring countries	121 (47.6)	50 (19.7)	83 (32.7)
Monkeypox is a viral disease infection	164 (64.6)	15 (5.9)	75 (29.5)
Monkeypox is a bacterial disease infection	174 (68.5)	8 (3.1)	72 (28.3)
Monkeypox is easily transmitted human-to-human	94 (37.0)	82 (32.3)	78 (30.7)
Monkeypox could transmitted through a bite of an infected monkey	109 (42.9)	49 (19.3)	96 (37.8)
Travelers from America continent are the main source of imported cased of monkeypox	125 (49.2)	21 (8.3)	108 (42.5)
Monkeypox and smallpox have similar signs and symptoms	142 (55.9)	31 (12.2)	81 (31.9)
Monkeypox and smallpox have the same signs and symptoms	126 (49.6)	52 (20.5)	76 (29.9)
Flu-like syndrome is one of the early signs or symptoms of human monkeypox	157 (61.8)	12 (4.7)	85 (33.5)
Rashes on the skin are one of the signs or symptoms of human monkeypox	169 (66.5)	19 (7.5)	66 (26.0)
Papules on the skin are one of the signs or symptoms of human monkeypox	175 (68.9)	15 (5.9)	64 (25.2)
Vesicles on the skin are one of the signs or symptoms of human monkeypox	160 (63.0)	10 (3.9)	84 (33.1)
Pustules on the skin are one of the signs or symptoms of human monkeypox	147 (57.9)	20 (7.9)	87 (34.3)
Lymphadenopathy is one clinical sign or symptom that could be used to differentiate monkeypox and smallpox cases	130 (51.2)	13 (5.1)	111 (43.7)
One management option for monkeypox patients who are symptomatic is to use paracetamol	151 (59.4)	18 (7.1)	85 (33.5)

Antivirals are required in the management of human monkeypox patients	120 (47.2)	65 (25.6)	69 (27.2)
Antibiotics are required in the management of human monkeypox patients	140 (55.1)	36 (14.2)	78 (30.7)
Diarrhea is one of the signs or symptoms of human monkeypox	121 (47.6)	33 (13.0)	100 (39.4)
Vaccination is available to prevent human monkeypox	135 (53.1)	54 (21.3)	65 (25.6)

To find out the relationship between socio-demographic characteristics of the respondents and their knowledge on HMPX virus, we conducted the chi square analysis. Statistically significant association revealed between HMPX knowledge score with sex ($\chi^2=20.99$, p<0.05), age group ($\chi^2=32.89$, p<0.05), educational qualification ($\chi^2=13.49$, p<0.05), monthly family income ($\chi^2=10.72$, p<0.05), job position at the hospital ($\chi^2=18.12$, p<0.05), total length of service ($\chi^2=20.51$, p<0.05), duration of service at the current place of posting ($\chi^2=20.56$, p<0.05) and attended any seminar/symposium/workshop in last 6 months ($\chi^2=9.89$. p<0.05) [Table 2].

Table 2: Association between Monkey pox knowledge score with the sociodemographic and other attributes of the respondents (n=254)

Attributes	Knowledge Score		Significance
	Poor	Good	
Sex of the respondents			
Male	67 (26.4%)	70 (27.6%)	$\chi^2=20.99$
Female	90 (35.4%)	27 (10.6%)	df=1, p=0.00*
Age group			
<25	45 (17.7%)	6 (2.4%)	$\chi^2=32.89$
26-30	73 (28.7%)	36 (14.2%)	df=3, p=0.00*
31-35	22 (8.7%)	29 (11.4%)	
>36	17(6.7%)	26 (10.2%)	
Educational Qualification			
Graduate	127 (50.0%)	58 (22.8%)	$\chi^2=13.49$
Post-graduate	30 (11.8%)	39 (15.4%)	df=1, p=0.00*
Religion			
Islam	143 (56.3%)	84 (33.1%)	$\chi^2=1.27$
Sanatan	14 (5.5%)	13 (5.1%)	df=1, p=0.26
Marital Status			
Married	93 (36.6%)	66 (26.0%)	$\chi^2=1.99$
Unmarried	64 (25.2%)	31 (12.2%)	df=1, 0.15
Monthly family income			
<40000	28 (11.0%)	8 (3.1%)	$\chi^2=10.72$
40001-60000	48 (18.9%)	25 (9.8%)	df=3, p=0.01*
60001-90000	26 (10.2%)	31 (12.2%)	
>90001	55 (21.7%)	33 (13.0%)	
Job position at the hospital			
Permanent	55 (21.7%)	60 (23.6%)	$\chi^2=18.12$
Temporary	38 (15.0%)	17 (6.7%)	df=2, p=0.00*
Trainee	64 (25.2%)	20 (7.9%)	
Total Service length			
<1	73 (28.7%)	26 (10.2%)	$\chi^2=20.51$
2-5	50 (19.7%)	24 (9.4%)	df=2, p=0.00*
>6	34 (13.4%)	47 (18.5%)	
Service at the current location			
<1	104 (40.9%)	36 (14.2%)	$\chi^2=20.56$
>2	53 (20.9%)	61 (24.0%)	df=1, p=0.00*
Attended any seminar			

| Yes | 64 (25.2%) | 21 (8.3%) | χ^2=9.89 |
| No | 93 (36.6%) | 76 (29.9%) | df=1, p=0.00* |

In regards to the EVIC score, it was revealed that about 50.4% respondents have a higher embrace to conspiracy beliefs regarding emerging viral infection (Figure 2) with a mean (±SD) score of 36.19 (±12.16). Item wise distribution of mean score revealed that highest mean (3.39) was found for the item "I am skeptical about the official explanation regarding the cause of virus emergence" followed by 3.24 mean score for the item "I do not trust the information about the viruses from scientific experts". On the other hand, lowest mean (2.76) was revealed for the item "The mainstream media is deliberately feeding us misinformation about the virus and lockdown" followed by "Coronavirus was a plot by globalists to destroy religion by banning gatherings" with a mean score of 2.79 [Table 3].

Figure 2: Distribution of EVICS Score among the respondents (n=254)
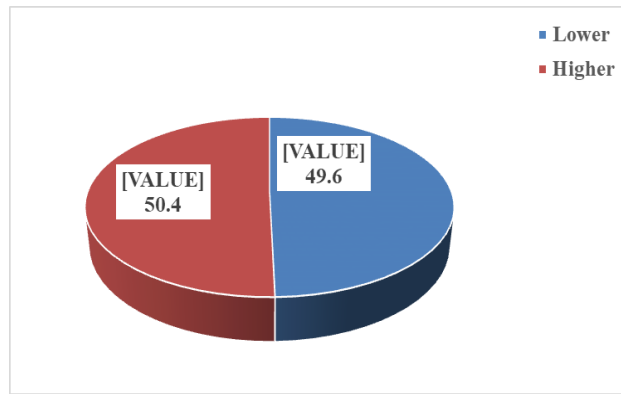
[7-point likert scale was used but in result only showed 3, responses of every questions were limited to 3 like disagree, neutral and agree]

Table 3: Item wise distribution of EVCIS score by the respondents (n=254)

Item	Disagree n (%)	Neutral n (%)	Agree n (%)	Mean (±SD)
I am skeptical about the official explanation regarding the cause of virus emergence.	142 (55.9)	64 (25.2)	48 (18.9)	3.39 (±1.3)
I do not trust the information about the viruses from scientific experts	137 (53.9)	59 (23.2)	58 (22.8)	3.24 (±1.5)
Most viruses are man-made	171 (67.3)	59 (23.2)	24 (9.4)	2.91 (±1.4)
The spread of viruses is a deliberate attempt to reduce the size of the global population	160 (63.0)	63 (24.8)	31 (12.2)	3.06 (±1.4)
The spread of viruses is a deliberate attempt by governments to gain political control	163 (64.2)	57 (22.4)	34 (13.4)	2.93 (±1.5)
The spread of viruses is a deliberate attempt by global companies to take control	172 (67.7)	52 (20.5)	30 (11.8)	2.88 (±1.4)
Lockdowns in response to emerging infection are aimed for mass surveillance and to control every aspect of our lives	167 (65.7)	40 (15.7)	47 (18.5)	3.09 (±1.6)
Lockdowns in response to emerging infection are aimed for mass surveillance and to destabilize the economy for financial gain	159 (62.6)	50 (19.7)	45 (17.7)	3.12 (±1.4)
Lockdown is a way to terrify, isolate, and demoralize a society as a whole in order to reshape society to fit specific interests	164 (64.6)	55 (21.6)	35 (13.8)	3.00 (±1.4)

Viruses are biological weapons manufactured by the superpowers to take global control	151 (59.4)	65 (25.6)	38 (15.0)	3.02 (±1.5)
Coronavirus was a plot by globalists to destroy religion by banning gatherings.	161 (63.4)	65 (25.6)	28 (11.0)	2.79 (±1.5)
The mainstream media is deliberately feeding us misinformation about the virus and lockdown.	154 (60.6)	70 (27.6)	30 (11.8)	2.76 (±1.6)

Table 4 depict the item wise distribution of the response by the respondents. For the purpose of the analysis, responses were grouped as "Agree" for the three agreement responses (strongly agree, agree and somewhat agree), while the group "Disagree" involved the disagreement responses (strongly disagree, disagree and somewhat disagree). It was revealed that majority of the respondents were disagreed about all the items of the EVIC scale with highest (67.7%) respondents disagreed on "The spread of viruses is a deliberate attempt by global companies to take control" followed by 67.3% on "Most viruses are man-made".

Table 4: Item wise distribution of EVCIS score by the respondents (n=254)

	Model 1					Model 2				
	B	**Sig.**	**OR**	**95% C.I. for OR**		**B**	**Sig.**	**OR**	**95% C.I. for OR**	
				Lower	**Upper**				**Lower**	**Upper**
Sex										
Male	1.118	**.000**	3.060	1.714	5.463	1.103	**.001**	3.014	1.613	5.631
Female		0.00					0.00			
Age group in years										
<30	-1.065	**.003**	.345	.172	.690	-1.006	**.050**	.366	.123	1.088
>31		0.00					0.00			
Education										
Graduate	-.547	.138	.579	.281	1.192	-.531	.219	.588	.252	1.371
Post-graduate		0.00					0.00			
Monthly income										
<40000	.247	.639	1.280	.457	3.585	.416	.455	1.515	.509	4.508
40001- 60000	.363	.347	1.438	.675	3.064	.619	.143	1.858	.811	4.257
60001-90000	.763	**.050**	2.145	1.002	4.595	.954	**.022**	2.597	1.147	5.881
>90001		0.00					0.00			
Job position in the hospital										
Permanent						.194	.677	1.215	.486	3.035
Temporary						.189	.673	1.209	.501	2.915
Trainee/Internee							0.00			
Total length of service in years										
<1						1.331	.079	3.784	.858	16.686
2-5						.054	.921	1.056	.358	3.111
>6							0.00			
Service in current place of posting										
<1						-1.135	**.010**	.322	.135	.766
>2							0.00			
Attended any seminar/symposium/workshop										
Yes						-.580	**.050**	.560	.282	1.114
No							0.00			
EVICS score										
High						.999	**.002**	2.715	1.430	5.154
Low							0.00			
Constant	-.421	.215	.656			-1.002	.100	.367		

To examine the unique contribution of HMPX knowledge score with sociodemographic and other predictors, a hierarchical logistic regression analysis was performed. Variables that explain the HMPX knowledge score is entered in two steps. In step 1, HMPX knowledge score was the dependent variable and sex, age group, education, monthly income group were the independent variables. In step 2, in addition to variables in step 1, job pattern, total length of service, length of service in current place of posting, attended any seminar/symposium/workshop in last 6 months and emerging viral infection conspiracy scale (EVICS) score were entered as independent variables. In the 1st model, the Likelihood Ratio (LR) chi-square test indicates that the model containing the set of predictors represents a significant improvement in fit relative to a null/intercept-only model, LR χ^2 (2) =48.098, p<.0001. The Hosmer & Lemeshow test result indicates no significant (p=.171) differences between observed and expected frequencies across different which indicates a reasonably well-fitting model. Overall, the classification table indicates that the observed knowledge score was correctly predicted at a rate of 70.5%. It was revealed in the 1st model that male had significantly higher (B=1.12, OR 3.06, 95% CI=1.714-5.463) knowledge on HMPX virus than that of the female, age group <31 years emerged as a negative and significant predictor than that of the age group >31 years (B= -1.065, OR 0.345, 95% CI=0.172-0.690), monthly income of between 60001-90000 taka also emerged as a positive and significant predictor than that of the income of >90001 taka (B=0.763, OR 2.145, 95% CI=1.002-4.595). Thus, the negative slope for age group of <31 years is indicating that as we move from lower to higher values of HMPX knowledge score, the probability of good knowledge on HMPX virus is decreasing., the positive slope of male sex indicates that male had 3.060 times more knowledgeable than that of the female.

The result shows in the 2nd model indicates that the fit of the model increased significantly from Model 1 (containing only sex, age group, education and monthly income) to Model 2 (adding job pattern, total length of service, service in the current place of posting, attended any seminar and EVICS score), LR χ^2 (2) =71.879, p<.001. The Hosmer & Lemeshow test result indicates no significant (p=.171) which indicates further evidence of a well-fitting model. Overall, the classification table indicates that the observed knowledge score was correctly predicted at a rate of 73.2%. In the Model 2, along with the significant predictors (sex, age and monthly income) in Model 1, adding to other explanatory variables revealed that service length in current place of posting (B=-1.135, OR 0.322, 95% CI=0.135-0.766) for <1

year emerged as a negative and significant predictor than that of the service for >1 year, attended any seminar/symposium/workshop in last six months (B=-0.580, OR 0.560, 95% CI=0.282-01.114) also emerged as negative and significant predictor than that on not attended group. It was also revealed from the Model 2 that higher EVICS score had a positive and significantly higher (B=0.999, OR 2.715, 95% CI=1.430-5.154) knowledge than that of the lower EVICS score. Thus, the negative slope for service length in current place of posting of <1 year is indicating that as we move from lower to higher (i.e.>1 year) values of HMPX knowledge score, the probability of good knowledge on HMPX virus is decreasing., the positive slope of higher EVIVS score indicates that healthcare professionals having higher EVICS score had 2.715 times more knowledgeable than that of the professionals with lower EVICS score [Table 4].

DISCUSSION

We conducted this study to assess the level of knowledge about HMPX and its relation to conspiracy belief among the healthcare professional serving in CMH Dhaka which is an iconic tertiary hospital in Bangladesh armed forces having multiple centers and discipline to deal with all sorts of medical and surgical cases among the entitled armed forces personnel. It is the affiliated hospital for armed forces medical college as well as post graduate training institute for Bangladesh College of Physicians and Surgeons (BCPS). The issue of conspiracy belief particularly in health related topics has been emerged during the onset of different epidemic and pandemic situation in the recent past, as seen during the pandemic of Middle East Respiratory Syndrome and Severe Acute Respiratory Syndrome. The prevalence of conspiracy belief also being demonstrated during the COVID-19 pandemic with varied psychological, social, emotional and physical impact as revealed other studies [12-14]. We revealed that more than 50% of the healthcare professional have belief in conspiracy theory in regards to the monkeypox viral emergence which is similar to other studies [12-13, 15-17]. Though human monkeypox viral infection is not that much prevalent in this subcontinent, but the recent outbreak of this viral disease in some region specially in USA and EU countries demands the assessment of knowledge regarding this viral infection along with its relation to the conspiracy belief in emerging viral infection.

The mean age of around 30 years supported that mostly the respondents were either trainee/internee along with junior doctors serving in CMH Dhaka which is similar to the study finding conducted by

Nath SD *et al.,* [18], Harapan H *et al.,* [6]. It is also revealed from the study that the sociodemographic findings among the healthcare professionals in CMH Dhaka were similar to the existing rules and regulations of Bangladesh Armed forces but somehow different from national average in many cases.

Our main findings of the study revealed very poor knowledge (61.8%) regarding HMPX virus among the respondents which is similar to the findings of the study conducted by Nath SD *et al.,* [18], Ricco, M *et al.,* [19], Sallam M. *et al.,* [3], Harapan H. *et al.,* [6] and Amyn A. *et al.*, [20] but dissimilar to the finding of the study conducted by Alshahrani NZ *et al.,* [21]. This poor knowledge among the healthcare professionals may be due to the fact that this disease is not prevalent in this subcontinent as well as poor coverage of the emerging/reemerging viral infections in the medical curricula which is supported by the findings of our study that about 59.5% of the respondents confess that they either don't have heard about HMPX during their student life or can't remember. At the same time, our study also revealed that 11.8% of the respondents never heard about HMPX infection. This finding is consistent with the study conducted by Harapan H. *et all.,* [6]. In regards to the source of information about HMPX, majority (53.3%) of the respondents received information from online and electronic media which was followed by medical journals (50.6%) and colleagues (19.0%). It is consistent with the finding of the study conducted by Harapan H. *et al.,* [6]. In our study, about 33.5% of the respondents attended seminar, symposium and workshop either local or international which was not similar to the findings of the study conducted by Harapan H. *et all.,* [6]. This dissimilarity may be due to the fact that most of our respondents attended workshop/seminar/symposium in the form of continued medical education (CME) program but in regards to the study findings by Harapan H. *et al.,* where their respondents only concerned with international seminar.

Our study revealed statistically significant association between HMPX knowledge score with sex (p<0.05), age group (p<0.05), educational qualification (p<0.05), monthly family income (p<0.05), job position at the hospital (p<0.05), total length of service (p<0.05), duration of service at the current place of posting (p<0.05) and attended any seminar/symposium/workshop in last 6 months (p<0.05) which is almost similar in regards to the gender, age group, level of education, heard of HMPX in student life to the findings of the study conducted by Alshahrani NZ *et al.,* [21]

Our study revealed that more than half (62.3%) of the respondents does not belief that "Coronavirus was a plot by globalists to destroy religion by banning gatherings" which is not similar to the findings of the study conducted by Sallam M *et al.,* [3]. Also 18.9% of the respondent's belief about the causes of the virus emergence which similar to the findings of the study conducted by Sallam M *et al.,* [3]. In our study, we revealed that only 15% respondent's beliefs that corona virus is a biological weapon manufactured by the superpower to take control which is dissimilar to the study conducted by Šrol J. *et al.,* [12]. Item wise response from the respondents revealed that majority of them either disagree or being neutral in all the items of EVIC scale which is not similar to the findings of the study conducted by Alsanafi M. *et al.,* [21]

To find out various determinants for the knowledge about HMPX viral infection among the respondents, we conducted hierarchical logistic regression analysis which revealed that

Result from hierarchical logistic regression revealed in the 1st model that male had significantly higher (B=1.12, OR 3.06, 95% CI=1.714-5.463) knowledge on HMPX virus than that of the female, age group <31 years emerged as a negative and significant predictor than that of the age group >31 years (B= -1.065, OR 0.345, 95% CI=0.172-0.690), monthly income of between 60001-90000 taka also emerged as a positive and significant predictor than that of the income of >90001 taka (B=0.763, OR 2.145, 95% CI=1.002-4.595) that means male sex, age group <31 years and monthly income of between 60001-90000 taka group had good knowledge on HMPX than that of the other groups. Similar finding revealed by Salam M. *et al.,* [3] but dissimilar to the study conducted by Nath SD *et al.,* [18], which is may be due to the study design as they conducted the study on general population of Bangladesh where as we conducted it on healthcare professionals. Our study also revealed that healthcare professionals having higher EVICS score had 2.715 times more knowledgeable than that of the professionals with lower EVICS score which is similar to the study findings conducted by Sallam M. *et al.,* [3] and Harapan H *et al.* [6].

This study has several strengths. It was the first systemic study among the health care professionals in CMH Dhaka to determine various determinants of knowledge regarding HMPX viral infection and its relation with the conspiracy belief at the very onset of the infection. Another strength of this study was good quality control, data were collected by the researcher using a pre-tested questionnaire to conduct face-to-face interviews from the healthcare professionals, considerably large sample size and the coverage of all

the groups of healthcare professionals posted either permanently or temporarily. Despite this, our study has several limitations that should be mentioned. First, the data were collected from healthcare professionals of a military hospital which did not guarantee the representativeness of the entire population i.e., the results cannot be generalized to all healthcare professionals. Second, as a cross-sectional study, this study could only evaluate the determinants of knowledge on HMPX infection without any longitudinal observations of the respondents. Third, due to time constrain, we only conducted a questionnaire interview with the respondents without any intervention. Forth, simple random sampling would be preferable in selecting the sample which was not appropriate in this particular instance. Finally, the possibility of selection bias may exist as the respondents were selected purposively for the study.

CONCLUSION

It was revealed from our study that the knowledge on HMPX viral infection among the healthcare professional not satisfactory. At the same time more than half of the respondents believe about the conspiracy theory regarding emerging viral infection. The poor knowledge is due to the lack of exposure to HMPX viral disease as well as absence of topics of HMPX virus on the medical curriculum. Moreover, female sex, lower age group respondents along with lower income group have significantly lower knowledge. As such intervention of appropriate health educational program should be incorporated in the medical study curriculum. At the same time, healthcare professionals should attend national or international seminar/ symposium/workshop of emerging viral infectious diseases.

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