Original Article

CONSPIRACY BELIEF REGARDING EMERGING VIRAL INFECTION AMONG HEALTHCARE PROFESSIONALS

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ABSTRACT

Background: In the recent past, newly appeared emerging and re-emerging viruses causing unexpected illness and epidemics among humans, wildlife and livestock causing threat to the public health. During onset of any pandemic, there was always an embrace of conspiracy theory regarding the pandemic along with several misconceptions, misperception and stigma among the general population. The study aimed to assess the state of conspiracy belief regarding emerging viral infection among the healthcare professionals working in Combined Military Hospital (CMH) Dhaka.

Methods: This cross-sectional study was conducted during July and September 2022 among conveniently selected 254 healthcare professionals working in CMH Dhaka. Data were collected through face-to-face interview using a pre-tested semi-structured questionnaire with validated and reliable tools.

Results: Among the 254 respondents, 53.9% were male with a mean age ($\pm$SD) of 30.54 (6.36) years. More than two-third (72.8%) were graduate, married (62.6%), mostly Muslim (89.4%) and non-smoker (80.3%) with an average ($\pm$SD) monthly income of 83740.16 (57456.80). Highest (45.3%) of the respondents were permanently posted and only 33.5% attended any seminar/workshop/symposium in last six months. Job pattern (β=0.199, p<0.007) and attended any seminar/workshop/symposium (β=-0.149, p<0.01) were determined as significant predictors for conspiracy belief regarding emerging viral infection through hierarchical analysis. Marital status of the respondents was also identified as significant socio-economic issues conspiracy belief in emerging viral infection.

Conclusion: The adoption of conspiracy belief regarding emerging viral infection demands appropriate public health intervention as well as awareness among the general population specially health care professionals as evident from our study.

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INTRODUCTION

In the recent past, there has been occurrence of newly appeared emerging and re-emerging viruses which causes unexpected illness and epidemics among humans, wildlife and livestock. These outbreaks seriously stretched both local and national resources at a time when health-care spending in the economically developed world has been constrained.[1] The newly identified zoonotic or vector-borne infectious agents constantly and relentlessly affect the public health with the outbreak of global concern. "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.[2] There are many factors responsible for the emergence, spread and transmission of the pathogens like urbanization, globalization, travels, international commerce, aging, and climate changes etc. It is being noticed that there is increasing contacts

among humans and potential zoonotic reservoirs as well as growing number of travelers and their movements causing a change in the environment which favors spread and outbreak of viral infection. It is also being noticed about the changes of geographical distribution within a previous endemic zone as well as susceptibility of the aged population to infection for the spread of the disease. The outbreak of several emerging and re-emerging infectious diseases were experienced by the global community during the last decades with high threats to the health security, biodefense, and economy worldwide. The occurrence of significant disease outbreaks—such as SARS (severe acute respiratory syndrome) originating in China in 2002, the 2009 H1N1 swine flu pandemic from Mexico, MERS (Middle East respiratory syndrome) that occurred in Saudi Arabia in 2012, the West African outbreak of Ebola virus (EBOV) in late 2013, the Zika virus (ZIKV) outbreak originating in Brazil in 2015, the 2018 health emergence in Nigeria caused by Lassa virus, the ongoing Coronavirus disease 2019 (COVID-19) pandemic and very recently emergence of monkey pox virus in certain region/territory of the world—has renewed interests in developing strategies to faster prevent, treat, and/or control emerging and re-emerging viruses with high epidemic potential. Once a new infectious agents appear for the first time in a certain geographic area (as in the case of novel corona virus or new influenza variant), very little or no knowledge about that virus regarding its identity, epidemiology and pathogenesis was seen in most of the cases. Also basing on the potential to spread out from the zoonotic reservoir, it is very difficult to predict where and when a disease outbreak will occur.[3]

When there is onset of any pandemic, it has been observed that due to several misconceptions, misperception and stigma the general people have a tendency to embrace different conspiracy theory regarding the 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. Various social psychological motives such as understanding one's environment (epistemic), feeling safe and in control (existential), maintaining positive image of one's self and group (social) etc. can be explained by the conspiracy theories. In case of COVID-19 pandemic, conspiracy theories satisfy an existential motive by helping people feel safe in their environment. When people feel anxious, powerless and unable to control their outcome as well as in times of crisis and when faced with large-scale events with serious consequences, at that time they are more likely to believe conspiracy theories. For restoring feelings of safety and control during any pandemic like COVID-19and monkeypox, people may turn to conspiracy theories. Medical conspiracy beliefs are additionally rooted partly in medical mistrust or a general suspicion of and lack of confidence in medical organizations and providers. A nationally representative study conducted in USA in 2013 suggested that most U.S. adults were aware of at least one of six popular medical conspiracy theories (e.g., the Food and Drug Administration is preventing access to cures to disease due to pressure from pharmaceutical companies) and 49% of adults agreed with one or more theory People who believe conspiracies are less likely to engage in a variety of pro-health behaviors. As examples, people who endorse conspiracy beliefs are less likely to get annual physical exams, visit the dentist, and use sunscreen. Some preliminary evidence suggests that COVID-19 conspiracy beliefs are associated with a lower rate of compliance with public health guidance to prevent the spread of COVID-19, such as minimizing time spent outside the home, maintaining social distance from people outside of one's household, and handwashing.[4]

The current study explored the state of conspiracy beliefs regarding emerging viral infections among the health care professionals of a tertiary hospital of Bangladesh along with their cooperation with public health recommendations, and support for public health policies surrounding emerging viral infections.

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 assess the state of conspiracy belief regarding emerging viral infection. 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 a

semi-structured questionnaire adopted and customized from the questionnaire previously used by Malik S. *et al.,.*[5] Prior to data collection, informed written consent were obtained from the respondents. Ethical approval for the study was granted by the ethical committee of CMH Dhaka with the number 2020/187 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 type and duration of job at the workplace, location of workplace etc., information related to characteristics of medical profession like location of the Alma mater, medical experience, attendance of any conference (Local, international or regional) etc. 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 Malik S. *et al.,.*[5] 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 the mean score) indicated a higher embrace of conspiracy beliefs regarding virus emergence and subsequent intervention measures. 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 ($\pm$SD) were used for descriptive statistics. Hierarchical regression model was used to describe significance of predictors of EVIC scale score. 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, average age was 30.54 years ($\pm$6.36) years and range was 22 to 55 years, 53.9% of them were male and 89.4% were Muslim. Highest (72.8%) were having a graduate degree and 62.6% were married. About one-third (34.6%) of the respondents had monthly income of >90001 taka with average of 83740.16 ($\pm$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 [Table-1].

Table 1: Sociodemographic Characteristics of the Respondents (n=254)

Attributes	Frequency (%)	Attributes	Frequency (%)
Sex of the Respondents		**Marital Status**	
Male	137 (53.9)	Married	159 (62.6)
Female	117 (46.1)	Single	95 (37.4)
Age group		**Monthly Income**	
<25	51 (20.1)	<40000	36 (14.2)
26-30	109 (42.9)	40001-60000	73 (28.7)
31-35	51 (20.1)	60001-90000	57 (22.4)
>36	43 (16.9)	>90001	88 (34.6)
Mean (SD)	30.54 (6.36)	Mean (SD)	83740.16 (57456.80)
Min – Max	22 - 55	Min – Max	10000 – 250000
Educational Qualification		**Type of family**	
Graduate	185 (72.8)	Nuclear	188 (74.0)
Post-graduate	69 (27.2)	Joint	66 (26.0)
Religion		**Smoking habit**	
Islam	227 (89.4)	Non-smoker	204 (80.3)
Hindu	27 (10.6)	Smoker	50 (19.7)

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 length of service was 5.23 years with SD $\pm$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 any sorts of seminar, symposium or workshop in the last six months. [Table 2].

Table 2: Job related information of the respondents (n=254)

Attributes	Frequency (%)	Attributes	Frequency (%)
Type of job		**Total length of service**	
Permanent	115 (45.3)	<1	99 (39.0)
Temporary	55 (21.7)	2-5	74 (29.1)
Trainee	88 (33.1)	>6	81 (31.9)
Service in current location		Mean (SD)	5.23 (5.75)
<1	140 (55.1)	Min – Max	01-28
>2	114 (44.9)	**Attended any seminar/symposium/workshop**	
Mean (SD)	2.55 (4.36)	Yes	85 (33.5)
Min – Max	1-9	No	169 (66.5)

Table 3 depicts 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".

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].

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)

We conducted two staged hierarchical linear regressions where we examined whether job pattern, total length of service. service in the current place of posting and attended any seminar/symposium/workshop predict those beliefs over and above demographic factors (age, gender, education, marital status). It was revealed that socio-economic factors like sex, age and marital status at stage one contributed significantly to the regression model [F (5, 248) = 81.15, p<0.000] and accounted for 14.1% of the variation in EVIC score of the respondents [Table 4].

Next, job pattern, length of service, service at current location and attended any seminar/workshop/symposium were entered into second model. Introducing these variables explained an additional 19.9% of variation in the outcome and this change in R² was significant [F (4, 244) = 44.41,

p<0.002]. In the first model of socio-economic factors sex, age and marital status showed significance predicting conspiracy belief due to emerging viral infection. Here, it is evident from values of regression coefficients that on average, conspiracy belief score is 2.734 units higher for male as compared to female (reference category) and this score decreases by 0.31 units as respondent's age increases by one year. In other words, if the age of respondent increases by one year, the conspiracy belief score will significantly decrease by 0.31 units. At the same time, the conspiracy belief score is 5.41 unit higher in married respondents than that of the unmarried respondents (reference category) which is statistically significant. In the second model only marital status of the respondents showed significance. Job pattern and attended in any seminar/workshop/symposium in the second model were significant to predict the outcome [Table 4].

Table 4. Summary of hierarchical regression analysis for variables predicting conspiracy belief (n=254)

Variables	Model 1			Model 2		
	B	SE (B)	β	B	SE (B)	β
(Constant)	30.447	6.553		22.361	9.717	
Sex	2.734	1.610	.112*	2.399	1.574	.099
Age (years)	-.315	.167	-.165*	.145	.316	.076
Educational qualification	.594	2.157	.022	.364	2.143	.013
Marital Status	5.409	1.759	.216**	4.364	1.741	.174*
Smoking Habit	1.769	2.008	.058	1.053	1.966	.034
Job pattern				2.755	1.006	.199**
Length of Service				-.329	.330	.156
Service at Current Place				.242	.518	.033
Attended any seminar				-3.845	1.550	-.149*
R²	0.141			0.199		
F for R² change	81.15***			44.41***		

DISCUSSION

We conducted this study to assess the state of conspiracy belief regarding emerging viral infections among the healthcare professionals serving in CMH Dhaka. CMH Dhaka 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). Recently it extended its training facilities to

the MD/MS candidate both from army and civil graduate medical professionals. 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 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.

It was revealed in our study that more than half (50.4%) of the respondent belief in the conspiracy regarding emerging viral infection i.e., higher EVICS score indicates higher embraces to the conspiracy theory and this finding is similar to the study conducted by [5-9]. 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.,* [5]. 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.,* [5]. 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.,* [8]. 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.,* [10].

Our study revealed that socio-economic factors like sex, age and marital status showed significance predicting conspiracy belief due to emerging viral infection. In regards to the sex, conspiracy belief score is 2.734 units higher for male as compared to female and this score decreases by 0.31 units as respondent's age increases by one year. It was also revealed that the conspiracy belief score is 5.41 unit higher in married respondents than that of the unmarried respondents which is statistically significant and also significantly predict in the second model. Job pattern and attended in any seminar/workshop/symposium in the second model were significant to predict the outcome.

CONCLUSION

The adoption of conspiracy belief regarding emerging viral infection demands appropriate public health intervention as well as awareness among the general population specially health care professionals as evident from our study. Marital status, job pattern and attended any seminar/symposium/workshop has a significant impact on embracing conspiracy belief regarding emerging viral infections.

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