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Insights into lifestyles of COVID-19 patients during home and hospital treatment: Urban context of Bangladesh

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Abstract

Background: The coronavirus 2019 (COVID-19) appeared with increased severity of COVID-19 due to the demographic and lifestyle factors are triggering immune system. Therefore, it is necessary to have insights on lifestyle pattern of patients.

Objective: This study aimed to explore the insights of lifestyle among urban COVID-19 patients of Bangladesh during home and hospital treatment.

Methods: The study used a cross-sectional design in urban settings of Bangladesh. A total of 659 respondents were recruited using multistage stratified sampling. A pretested semi-structured questionnaire was used to collect data from both hospital and community settings through face-to-face interview method. Analysis was done by using univariate, multivariate techniques followed by regression modeling.

Results: More than half (59%) of the patients received treatment at hospital, whereas 41% positive cases got cured from out of hospital cares like family care support or other supports. As predictors, advanced (≥ 50 years) aged (AOR=2.43) and less (higher secondary) educated (AOR=1.80) patients who were housewives (AOR=2.02), service holders (AOR=1.89) or businessman (AOR=2.13) took more significant hospital support compared to other group. Respondents who didn't maintain any physical exercise (AOR=1.37) and having sleeping disorder (AOR=1.10) found to have more healthcare support from hospital setting in corresponded to out of hospital.

Conclusion: This study revealed a depressive scenario of the treatment management pattern for COVID-19 infected patients during pandemic. This study may guide the policymakers to plan and develop a sustainable health care facility which can support general population in any sudden and emerging health related disasters.

Keywords: Lifestyles; COVID-19 patients; Home and Hospital Treatment; Urban

1. Introduction

The novel corona virus that causes COVID-19 infection can be transmitted directly through human-to-human contact or indirectly with contaminated objects [1]. Symptoms include fever, dry coughing, vomiting, diarrhea, nausea and fatigue resulting in severe problems such as difficulty in breathing, talking, moving and chest pain [1,2]. The World Health Organization (WHO) classified COVID-19 as a pandemic on 11 March 2020. COVID-19 has spread widely and rapidly,

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and globally the cumulative number of reported cases reaches to nearly 509 million with deaths just under 6.2 million [3].

The unprecedented crisis of COVID-19 has posed an enormous challenge in healthcare sector worldwide and Bangladesh is not an exception. Bangladesh confirmed the first COVID-19 case on 7 March 2020 and rapidly imposed lockdown followed by some rules and restrictions on social distancing, mandatorily wearing masks, limited transport facilities and travel, etc., as suggested by the WHO [4, 5, 6]. As of April 2022, there were 1.95 million confirmed cases and 29,127 deaths related to COVID-19 in the country [7]. The government has opened 120 centers/institutes throughout the country to get information on hospital admission, health messages and vaccination against COVID-19. Moreover, 10 dedicated government hospitals with 2555 regular beds and 128 emergency beds are introduced to provide healthcare [8].

WHO recommended symptomatic treatment and suggested seeking urgent care through the established COVID-19 care pathway in complicated cases [9]. Patients with suspected or confirmed mild COVID-19 should be isolated at a designated health facility, community facility or self-isolation at home. To monitor a suspected case in a health facility or home needs to be made on case-by-case basis. While for the management of severe patients, healthcare facilities need to be equipped with different medical devices and instruments [10].

As Bangladesh is a densely populated country with limited healthcare resources, the control of COVID-19 is difficult without public participation. Analytical research on healthcare, social and economic challenges depicts that limited number of well-equipped hospitals, inadequate testing facilities, lack of awareness, improper knowledge, attitude and practice of rules are dominating factors in spreading COVID-19 in hospital settings in Bangladesh [4].

People with COVID-19 were reported to have wide range of symptoms– ranging from mild to severe illness. Symptoms may appear 2-14 days after exposure to the virus and anyone can have mild to severe symptoms such as fever or chills, cough, shortness of breath or difficulty breathing, fatigue, muscle or body aches, headache, loss of taste or smell, sore throat, congestion or runny nose, nausea or vomiting, diarrhea, etc. [11]. The management of COVID-19 entirely depends on the severity of disease manifestations.

In Bangladesh, DGHS provided national guidelines containing both pharmacological and non-pharmacological interventions for the management of COVID-19 patients on the basis of asymptomatic, and mild, moderate and severe symptoms [12]. For asymptomatic patients' home or institutionalized supportive care and isolation is suggested. During self-isolation at home it needs to take rest, maintain physical distancing from family members, regular hand washing, maintaining cough etiquette, using mask for both patient and caregivers are advised to follow. In addition, if self-isolation is not possible at home because of appropriate caregiver, overcrowding or for any other reasons, patient should be brought to the hospital for institutional isolation in a designated area. Home isolation is also recommended for COVID-19 patients who have mild clinical symptoms with controlled co-morbidities and no symptoms of hypoxia or shortness of breath and no radiological evidence of pneumonia. Hospitalization is suggested for both moderate and severe COVID-19 cases by the DGHS.

Studies evidenced that demographic and lifestyle factors are triggering the increased severity of COVID-19. Older people and people suffering from other co-morbidities have lingering symptoms and COVID-19 may affect heart, lung, brain and blood vessels which need hospital support [13, 14]. Some patients develop severe complications like respiratory distress and pneumonia, resulting in death [15]. Unhealthy lifestyles *i.e.*, physical inactivity, smoking, harmful dietary habits, obesity, etc. elevated risks for COVID-19 hospital admission [16, 17, 18].

Therefore, it is necessary to have insights on demographic and lifestyle pattern of patients while receiving COVID-19 treatment in hospital or at home settings. This information can generate the original portrait of future treatment plan and also reduce the governments' burden in combating the outbreak strategies. The current study aimed to reveal the insights of lifestyle among COVID-19 patients of urban Bangladesh during home and hospital treatment.

The study findings explored to what extent people resorted to hospital service and family care in dealing with COVID-19 patients. In addition, this study suggested necessary programs need to be taken by community-based voluntary organizations that can help the people toward a practical pathway in tackling future pandemic.

2. Methods

2.1. Study Design and settings

Adescriptive type of cross-sectional survey was conducted followed quantitative approach. Data was collected from both hospital and community settings in May-August 2021. Information from COVID-19 patients was collected randomly from four COVID-19 dedicated hospitals (public and private) in Dhaka city, viz. Dhaka Medical College Hospital; Mugda Medical College Hospital; Shaheed Suhrawardy Medical College Hospital and Kurmitola General Hospital. In the other hand, data was collected from eight community/wards from two city corporations of Dhaka, viz., Wards 6, 13, 29, 51 of Dhaka South City Corporation and Wards 19, 23, 34, 53 of Dhaka North City Corporation to have an understanding on the management of COVID-19 patients at home settings.

2.2. Study participants, sample size and sampling

This study included a total of 659 COVID positive cases that received treatment either at home or in hospital setting. The following formula was used to calculate

$$\text{sample size; } n = \frac{z^2 pq}{d^2},$$

where, n= desired sample size;

z= 1.96 (95% confidence interval);

p= population proportion (considering 26.6% of people were being infected)[19],

q=1-p; and

d= precision level (5%), and adjusting 10.0% non-response.

Consequently, the calculated number was 330. The samples were doubled considering access to the patients to both hospital and out of hospital settings. Finally, a total of 659 COVID positive patients were recruited in this study. Patients above 18 years, irrespective of sex and religion were selected for interview. COVID-positive cases that received treatment either at home or in a hospital constituted the study population. Severely infected hospitalized patients and those who attended the selected hospitals from other cities were excluded from the study.

Multi-stage stratified sampling was followed to gather a representative sample of public and private hospitals and community settings. In the first stage, four hospitals were randomly selected from the list of COVID-19 dedicated hospitals. Additionally, eight wards (four each from Dhaka North and Dhaka South City Corporation) were randomly chosen to gather data at community level. Finally, targeted number of clinically positive cases (659) was selected proportionately from hospital and community.

2.3. Data Collection

Apre-tested and semi-structured questionnaire was developed by a multidisciplinary team of social scientists, epidemiologists, physicians and statisticians for collecting data. Data was collected from the respondents using interviewer-administered method. Informed consent was taken from the study participants before interview. All authors had access in the collection and preserving participant's information during or after data collection. The survey was administered in Bengali language with the utmost support of the hospital and community authorities.

2.4. Ethical considerations

This study was approved by the Ethical Review Committee of the Bangladesh Medical Research Council (BMRC) and conformed to the Declaration of Helsinki. Participation of the respondents was anonymous and voluntary. Informed consent was sought from the respondents at the beginning of the survey and participants could withdraw from the survey at any time.

2.5. Questionnaire design

The questionnaire was pre-validated by two independent reviewers and pre-tested among 10 respondents. The quality of the questionnaire addressed the responses of the pre-test. The quantitative questionnaire comprised of several segments: (i) Treatment receiving place of COVID-19 infected patients; (ii) Demography information of the patients: age, gender, profession, education, marital status, monthly family income, occupation and family size; Health and

lifestyle related information: nutritional status, tobacco use, physical exercise, sleeping disorders, sunlight exposures (15-20 minutes/day), avoid junk (fast/ preserved) food, drunk 8-10 glasses of liquid and took any food supplement.

2.6. Data analysis

The data were analyzed using Stata version 14.2 SE (StataCorp 2015; Statistical Software: Release 14. College Station, TX: Stata Corp LP). Using descriptive statistics and chi-square tests, the frequency including proportion of socio-demographic and lifestyle related variables according to the treatment receiving place were investigated. A binomial logistic regression analysis was performed followed by modeling procedure considering backward elimination process, including pre-specified confounders i.e. age, gender, profession, education, marital status, monthly family income, occupation and family size; Health and lifestyle related information: nutritional status, tobacco use, physical exercise, sleeping disorders, sunlight exposures (15-20 minutes/day), avoid junk (fast/ preserved) food, drunk 8-10 glasses of liquid and took any food supplement. Odds Ratios with 95% confidence intervals with respect to treatment receiving place during COVID-19 infection was calculated for the specified exposures.

3. Results

3.1. Participant's characteristics

Socio-demographic characteristics were obtained from the respondents aged 18-85 years with mean 38.4 (± 13.9) years, of them 60.2% being female. One-fourth (25.5%) has up to secondary level of education, while half (46.0%) attained bachelor and above. A quarter of the respondents (23.4%) were healthcare service provider and more than half of the respondents (57.5%) had <50,000/- BDT of their monthly family income.

Half of the respondents had physical exercise (49.9%) and was significantly higher ($p < 0.01$) among the patients treated at home. It is evident that, nearly 80 percent respondents avoid junk food; 92 percent drunk 8-10 glass of liquid daily and more than half of the respondents (53.7%) took food supplements. (Table 1)

Table 1 Characteristics of the respondents according to treatment receiving place (n=659)

Characteristics	Treatment receiving place			
	Total, n (%)	Home, n (%)	Hospital, n (%)	p-value (≤ 0.05)
Demographics				
Age group (in years)				
≤29	195(29.69)	101(37.83)	94(23.98)	0.01*
30-49	312(47.34)	132(49.44)	180(45.92)	
≥50	152(23.07)	34(12.73)	118(30.10)	
Gender				
Male	262(39.76)	106(39.70)	156(39.80)	0.98
Female	397(60.24)	161(60.30)	236(60.20)	
Education				
Up to Secondary	168(25.49)	61(22.85)	107(27.30)	0.01*
Higher Secondary	188(28.53)	62(23.22)	126(32.14)	
Graduate and above	303(45.98)	144(53.93)	159(40.56)	
Marital status				
Single	168(25.49)	61(22.85)	107(27.30)	0.01*
Married	188(28.53)	62(23.22)	126(32.14)	
Monthly Family Income (BDT)				
Up to 50000	379(57.51)	152(56.93)	227(57.91)	0.8

>50000	280(42.49)	115(43.07)	165(42.09)	
Occupation				
Health service provider	154(23.37)	89(33.33)	65(16.58)	0.01*
Service	278(42.19)	105(39.33)	173(44.13)	
Business	79(11.99)	24(8.99)	55(14.03)	
Housewife	124(18.82)	36(13.48)	88(22.45)	
Student	24(3.64)	13(4.87)	11(2.81)	
Family size				
Up to 4	385(58.42)	159(59.55)	226(57.65)	0.63
> 4	274(41.58)	108(40.45)	166(42.35)	
Nutritional status				
Underweight	37(5.61)	14(5.24)	23(5.87)	0.68
Normal weight	423(64.19)	167(62.55)	256(65.31)	
Overweight	131(19.88)	54(20.22)	77(19.64)	
Obese	68(10.32)	32(11.99)	36(9.18)	
Life style				
Tobacco use				
No	569(86.34)	227(85.02)	342(87.24)	0.41
Yes	90(13.66)	40(15.98)	50(12.76)	
Physical exercise				
No	330(50.08)	114(42.70)	216(55.10)	0.01*
Yes	329(49.92)	153(57.30)	176(44.90)	
Sleeping disorders				
No	446(67.68)	193(72.28)	253(64.54)	0.03*
Yes	213(32.32)	74(27.72)	139(35.46)	
Sunlight exposure (15-20 minutes/day)				
No	328(49.77)	131(49.06)	197(50.26)	0.76
Yes	331(50.23)	136(50.94)	195(49.74)	
Avoid junk (fast/preserved) food				
No	139(21.09)	68(25.47)	71(18.11)	0.02*
Yes	520(78.91)	199(74.53)	321(81.89)	
Drunk 8-10 glasses of liquid				
No	53(8.04)	33(12.36)	20(5.10)	0.01*
Yes	606(91.96)	234(87.64)	372(94.90)	
Took any food supplement				
No	305(46.28)	144(53.93)	161(41.07)	0.03*

Yes	354(53.72)	123(46.07)	231(58.93)	
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Figures in the parentheses represents percentage; *Statistical significance at p value ≤ 0.05 . Chi-square test was used to observe the association.

3.2. Place of receiving treatment during COVID-19 infection

This study revealed a crucial finding and that is more than half of the respondents (59%) received treatment from the hospital during their COVID-19 infection. On the other hand, also a big portion (41%) of the respondents managed their COVID-19 infection at home. (Figure 1)

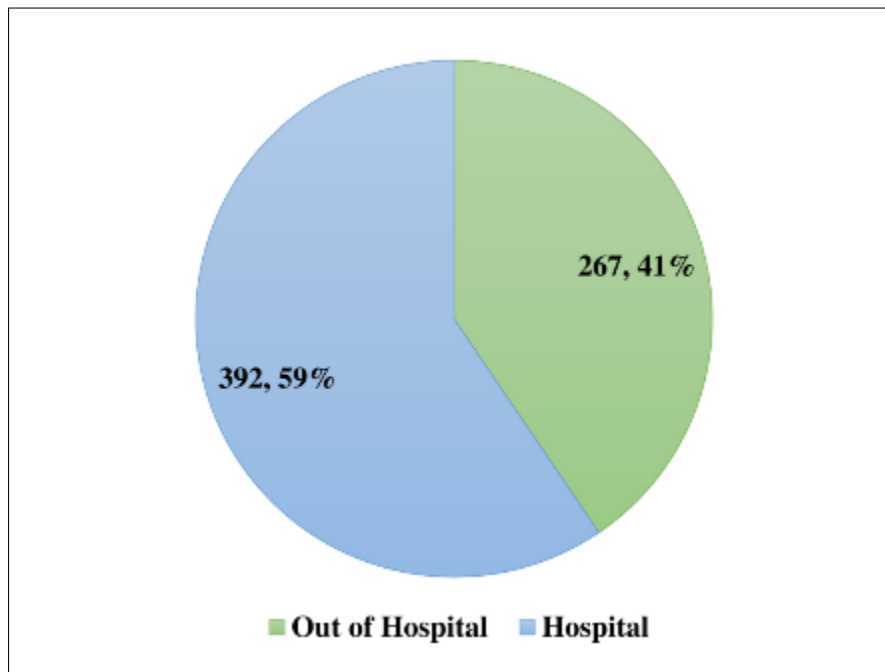


Figure 1 Place of receiving treatment during COVID-19 infection (n=659)

3.3. Determinants associated with the place of treatment receive

This study identified some factors which were significantly associated with hospital as treatment receiving place. Study significantly found that respondents from older (≥ 50 years) aged ($P=0.01$) group, with higher secondary level of education ($P=0.01$), married ($P=0.01$), service holder, businessman, housewife ($p=0.01$) as occupation took hospital treatment to be cured from COVID-19 infection. In addition, it was also revealed that respondents who were not habituated with physical exercise ($P=0.01$), with having any sleeping disorders ($p=0.03$), used to avoid junk food ($p=0.02$), habituated on in taking 8-10 glass of liquid/day ($p=0.01$) and used to took other food supplements ($p=0.03$) has been revealed as significant to receive treatment from hospital during their COVID-19 infection. (Table 1)

A binomial logistic regression analysis was conducted to identify the significant determinants associated with the place of treatment received by the respondents. The place of treatment received was consider as the dependent variable while age, education, marital, occupation, physical exercise, sleeping disorders, avoid junk (fast/preserved) food, drunk 8-10 glasses of liquid, took food supplement were the independent variables. Receiving treatment at hospital found comparatively higher among respondents aged above 50 (COR:3.72, 95% CI 2.32- 5.98) years. In addition, significant lower odd found among the married respondents (COR:1.75, 95% CI 1.20-2.56) who had graduation and above degree (COR:0.62, 95% CI 0.42-0.92). Odds of treatment at hospital was found more likely higher among the respondents who were housewife (COR:3.34, 95% CI:2.02- 5.53), businessman (COR:3.13, 95% CI:1.76- 5.58), and service holders (COR:2.25, 95% CI 1.51- 3.36) comparative to the health service providers. Moreover, respondents who were not used to maintain physical exercise (COR:1.64, 95% CI 1.20- 2.25) and had sleeping disorder (COR:1.43, 95% CI 1.02- 2.01) found more significant to receive hospital treatment for COVID sickness. Furthermore, it was also found significant that respondents who avoided junk food (COR:1.54, 95% CI 1.06- 2.25), drunk 8-10 glasses of liquid (COR:2.62, 95% CI 1.47- 4.68) and took food supplements (COR:1.67, 95% CI 1.22- 2.29), needed more hospital support for COVID-19 infection compare to others. (Table 2)

Table 2 Predictors associated with the treatment receiving place of the respondents (n=659)

Characteristics	Treatment receiving place			
	Hospital vs. out of hospital			
	Un-adjusted OR (95% CI)	P-value	Adjusted OR 95% CI	P-value
Demographics				
Age group (in years)				
≤29	Reference			
30-49	1.46 (1.02- 2.09)	0.03*	1.10 (0.70- 1.74)	0.65
≥50	3.72 (2.32- 5.98)	0.01*	2.43 (1.32- 4.46)	0.01*
Education				
Up to Secondary	Reference			
Higher Secondary	1.15 (0.74- 1.79)	0.51	1.80 (1.08- 2.98)	0.02*
Graduation and above	0.62 (0.42-0.92)	0.01*	1.03 (0.64- 1.66)	0.89
Marital status				
Single	Reference			
Married	1.75 (1.20- 2.56)	0.01*	0.89 (0.54- 1.46)	0.64
Occupation				
Health provider service	Reference			
Service	2.25 (1.51- 3.36)	0.01*	1.89 (1.21- 2.94)	0.01*
Business	3.13 (1.76- 5.58)	0.01*	2.13 (1.11- 4.09)	0.02*
Housewife	3.34 (2.02- 5.53)	0.01*	2.02 (1.10- 3.70)	0.02*
Student	1.15 (0.48- 2.74)	0.74	1.16 (0.44- 3.06)	0.75
Life style				
Physical exercise				
No	1.64 (1.20- 2.25)	0.01*	1.37 (0.97- 1.94)	0.07
Yes	Reference			
Sleeping disorders				
No	Reference			
Yes	1.43 (1.02- 2.01)	0.04*	1.10 (0.76- 1.59)	0.59
Avoid junk (fast/preserved) food				
No	Reference			
Yes	1.54 (1.06- 2.25)	0.02*	1.18 (0.76- 1.81)	0.45
Drunk 8-10 glasses of liquid				
No	Reference			

Yes	2.62 (1.47- 4.68)	0.01*	1.65 (0.85- 3.20)	0.14
Took any food supplement				
No	Reference			
Yes	1.67 (1.22- 2.29)	0.01*	1.39 (0.98- 1.97)	0.06

Logistic Regression Analysis was used to identify the predictors; * Statistical significance at p-value ≤ 0.05 . Treatment receiving place out of hospital during COVID-19 was considered as a reference category.

Finally, statistical modeling was adjusted by the significant determinants with crude odds and confounders were eliminated through the backward elimination procedure. After that, study revealed the utmost significant predictors associated with the behavior towards treatment receiving place during COVID-19 sufferings of the subjects. As predictor study revealed that senior subjects (AOR: 2.43, 95% CI 1.32- 4.46) with higher secondary education (AOR: 1.80, 95% CI 1.08- 2.98) who were housewife (AOR: 2.02, 95% CI 1.10- 3.70), businessman (AOR: 2.13, 95% CI 1.11- 4.09) and service holder (AOR: 1.89, 95% CI 1.21- 2.94) found statistically significant to receive hospital treatment management service during COVID-19 suffering periods compare to home-based management procedure. (Table 2)

4. Discussion

The unique approach of this study was intended to explore the factors that determined the treatment-receiving scenario among COVID-19 patients during the pandemic. This study illustrated the demography and lifestyle of COVID-19-positive patients concerning their dealings with the disease as treatment like having hospital service or family care support.

A total of 659 samples were studied, half of them (47.34%) were from the middle age group (30-49 years) and mostly females (60.24%). This finding is similar to the report from the Institute of Epidemiology, Disease Control and Research (IEDCR) where it was reported that in Bangladesh 68% of COVID-19-positive cases were aged 21-50 years [4]. Another study among healthcare professionals in Bangladesh observed a significant COVID-19 infection in the middle age group [20]. The highest number of respondents were found as having a graduate and above degree (45.98%) with the occupation service holder (42.19%) whereas more than half (57.51%) had a monthly family income of up to 50000 BDT. This scenario coincides with a recent study that observed 32% of infected subjects were service holders [21]. The majority of them had a nuclear family (58.42%) with up to 4 family members and had normal weight (64.19%) in terms of BMI.

The lifestyle of the respondents revealed that very few of them consumed tobacco (13.66%), mostly avoided junk food (78.91%) in their daily life, almost all of them drank 8-10 glasses of liquid (91.96%) and more than half took other food supplements (53.72%). In addition, nearly half (49.92%) of the participants were maintaining physical exercise, and a good number had sleeping disorders (32.32%). Similar findings were represented by another study in Bangladesh as 26.4% of patients were smokers before COVID-19 infection where only 17.2% did an adequate physical activity, 36.8% had sleep disturbance and 55.1% drank at least eight glasses of water per day [21]. However, the current study revealed that most of the respondents drank 8-10 glasses of liquid daily indicating that people are knowing the preventive practices during COVID-19 infection.

This study revealed another crucial thing more than half of the patients receive treatment at the hospital, whereas a good number of positive cases got cured from hospital cares like family care support or other supports. This scenario has two different explanations; one is that Bangladesh had limited well-equipped hospitals and inadequate testing facilities to mitigate COVID-19 properly using healthcare settings [4]. In addition, significant discrepancies were found to get services from COVID-dedicated hospitals [22] which restricts COVID-19-positive citizens to have optimal healthcare support during the pick time of the pandemic and most of the affected citizens preferred to remain at home fearing maltreatment during hospitals [23]. Moreover, severe cases are needed hospital care support and this scenario is reflecting the situation of severe cases that had treatment support from the hospital. Findings from this study indicate that severe cases with a big struggle of communication got hospital services, while others got cured through family care because of such limitations of hospital services during the pandemic. A report showed that around 79% of people took home isolation and received treatment over the phone during the onset of the pandemic [24]. It seems that gradually the health services have increased to serve the affected people.

To observe the factors determining the treatment receiving status from home or hospital setting, it is revealed that advanced (≥ 50 years) aged respondents took hospital service two times higher (AOR=2.43, 95% CI: 1.32- 4.46) than younger age groups. It is also found that less educated married (AOR=1.80, 95% CI: 1.08- 2.98) patients took more hospital support for recovery. This might be due to less awareness of COVID-19 prevention and management at home as they are less educated. A few drawbacks of poor lifestyles also triggered the severity of the infection that forced them to have hospital support. Such as respondents who did not maintain any physical exercise and had sleeping disorders were found to have more healthcare support at the hospital. Despite such negative lifestyles, this study also revealed some positive behaviors among the infected patients. Higher proportions of respondents who avoided junk food and took 8-10 glasses of liquid daily seek healthcare support from hospitals, as they were older with having comorbidities. According to CDC, the risk of severe illness due to COVID-19 increases with age, and the study showed 18 times higher risk of severe infection among aged patients (AOR=18.223, 95% CI: 10.21–32.53) which leads to more hospital support [25,21]. Mohsin, et al. also revealed that participants with sleep disturbance had 2.2 times more risk of developing severe infection (AOR=2.208, 95% CI: 1.601–3.044). Another study revealed that a low amount of physical activity increases the risk of severe COVID-19 infection [17] which tends to be admitted to a hospital for exclusive treatment. Our study also found a such association among Bangladeshi samples.

Our study has a few limitations (low sample only from one district, missing validated physical activity and sleep disturbance questionnaire), but the outcome of this study is crucial to figure out the drawbacks of not having hospital care service during COVID-19 infection among Bangladeshi citizens. Thus, COVID-19-infected patients will get exclusive hospital care services without any struggle and reduce the mortality rate as well as break the infection chain for successful prevention among the population. Moreover, based on this formative study more comprehensive survey is needed with a validated instrument to generalize the conclusion as well as plan for the specific intervention on a priority basis.

5. Conclusion

This study has successfully revealed the demography and lifestyle risk factors influencing the pattern of treatment-receiving behavior or status among the COVID positive patients in Bangladesh. Higher secondary educated older adults who are housewives or businessmen or service holders with poorly maintained physical activity should be kept under special consideration to provide facilities against COVID-19. Policymakers and responsible authorities associated with healthcare should arrange comprehensive awareness-raising programs and educate people on healthy lifestyle (i.e. increase physical activity, drink adequate water, have adequate sleep, and avoid smoking and junk food) to prevent the severity of COVID-19 infection. Both public and private health service authorities should pay immediate attention to mitigate the challenges of health care settings and proper management of these risk factors as well as come up with appropriate action.

Compliance with ethical standards

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- Bangladesh Medical Research Council
- Daffodil International University
- Northern University Bangladesh

Disclosure of conflict of interest

The authors declared no potential conflicts of interests with respect to the research, authorship, and/ or publication of this article.

Statement of ethical approval

This study was approved by the Ethical Review Committee of the Bangladesh Medical Research Council (BMRC) and conformed to the Declaration of Helsinki.

Statement of informed consent

Participation of the respondents was anonymous and voluntary. Informed consent was sought from the respondents at the beginning of the survey and participants could withdraw from the survey at any time.

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References

- [1] Shan C, Yao YF, Yang XL, Zhou YW, Gao G, Peng Y, Yang L, Hu X, Xiong J, Jiang RD, Zhang HJ. Infection with novel coronavirus (SARS-CoV-2) causes pneumonia in Rhesus macaques. *Cell research*. 2020 Aug;30(8):670-7.
- [2] ÇalicaUtku A, Budak G, Karabay O, Güçlü E, Okan HD, Vatan A. Main symptoms in patients presenting in the COVID-19 period. *Scottish medical journal*. 2020 Nov;65(4):127-32.
- [3] World Health Organization (WHO). (2022a). WHO Health Emergency Dashboard, WHO (COVID-19) Homepage. WHO Coronavirus (COVID-19) Dashboard. Available from: <https://covid19.who.int/> [Accessed 29th April 2022].
- [4] Islam T, Talukder AK, Siddiqui N, Islam T. Tackling the COVID-19 pandemic: The Bangladesh perspective. *Journal of public health research*. 2020 Oct 14;9(4):jphr-2020.
- [5] Anwar S, Nasrullah M, Hosen MJ. COVID-19 and Bangladesh: challenges and how to address them. *Frontiers in public health*. 2020 Apr 30;8:154.
- [6] Banu B, Chowdhury SH, Akter N, Islam KR, Hossain SM, Amin MR. Preventive Behaviors to Mitigate COVID-19: Urban-Rural Disparities of Densely Populated Country like Bangladesh. *Journal of Environmental Science and Public Health*. 2021;5(4):433-50.
- [7] World Health Organization (WHO). (2022b). WHO Health Emergency Dashboard, WHO (COVID-19) Homepage. Global, Bangladesh. Available from: <https://covid19.who.int/region/searo/country/bd> [Accessed 29th April 2022].
- [8] Directorate General of Health Services (DGHS), Government of the People's Republic of Bangladesh. (2021). COVID-19, Corona Hospital Information (Bed and Others). Available from: https://old.dghs.gov.bd/images/docs/vpr/covid19_hospital_information.pdf [Accessed 29th April 2022].
- [9] World Health Organization (WHO). (2020a). Clinical Management of COVID-19. Available from: <https://www.who.int/publications-detail-redirect/clinical-management-of-covid-19> [Accessed 29th April 2022].
- [10] World Health Organization (WHO). (2020b). Criteria for releasing COVID-19 patients from isolation. Available from: <https://www.who.int/news-room/commentaries/detail/criteria-for-releasing-covid-19-patients-from-isolation> [Accessed 29th April 2022].
- [11] Centers for Disease Control and Prevention (CDC). (2022). Symptoms of COVID-19, COVID-19. Available from: <https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html> [Accessed 29th April 2022].
- [12] Directorate General of Health Services (DGHS), Government of the People's Republic of Bangladesh. (2020). National Guidelines on Clinical Management of Coronavirus Disease 2019 (Covid-19). Available from: http://hospitaldghs.gov.bd/wp-content/uploads/2020/04/COVID_Guideline.pdf [Accessed 29th April 2022].
- [13] Hubbard G, den Daas C, Johnston M, Dixon D. Sociodemographic and psychological risk factors for anxiety and depression: findings from the Covid-19 health and adherence research in Scotland on mental health (CHARIS-MH) cross-sectional survey. *International journal of behavioral medicine*. 2021 Dec 1:1-3.
- [14] Sanyaolu A, Okorie C, Marinkovic A, Patidar R, Younis K, Desai P, Hosein Z, Padda I, Mangat J, Altaf M. Comorbidity and its impact on patients with COVID-19. *SN comprehensive clinical medicine*. 2020 Aug;2:1069-76.
- [15] Chavez S, Long B, Koyfman A, Liang SY. Coronavirus Disease (COVID-19): A primer for emergency physicians. *The American journal of emergency medicine*. 2021 Jun 1;44:220-9.
- [16] Dai CL, Kornilov SA, Roper RT, Cohen-Cline H, Jade K, Smith B, Heath JR, Diaz G, Goldman JD, Magis AT, Hadlock JJ. Characteristics and factors associated with coronavirus disease 2019 infection, hospitalization, and mortality across race and ethnicity. *Clinical Infectious Diseases*. 2021 Dec 15;73(12):2193-204.
- [17] Hamer M, Kivimäki M, Gale CR, Batty GD. Lifestyle risk factors, inflammatory mechanisms, and COVID-19 hospitalization: A community-based cohort study of 387,109 adults in UK. *Brain, behavior, and immunity*. 2020 Jul 1;87:184-7.

- [18] Hamdan M, Badrasawi M, Zidan S, Sayarah A, Zahra LA, Dana S, Almasry T. Risk factors associated with hospitalization owing to COVID-19: a cross-sectional study in Palestine. *Journal of International Medical Research*. 2021 Dec;49(12):03000605211064405.
- [19] Worldometer. (2021). World-Countries-Bangladesh. Available from: <https://www.worldometers.info/coronavirus/country/bangladesh/> [Accessed 2nd May 2021].
- [20] Banu B, Akter N, Chowdhury SH, Islam KR, Islam MT, Hossain SM. Infection and vaccination status of COVID-19 among healthcare professionals in academic platform: Prevision vs. reality of Bangladesh context. *PloS one*. 2022 Feb 18;17(2):e0263078.
- [21] Mohsin FM, Nahrin R, Tonmon TT, Nesa M, Tithy SA, Saha S, Mannan M, Shahjalal M, Faruque MO, Hawlader MD. Lifestyle and Comorbidity-Related Risk Factors of Severe and Critical COVID-19 Infection: A Comparative Study Among Survived COVID-19 Patients in Bangladesh. *Infection and Drug Resistance*. 2021 Sep 30:4057-66.
- [22] UNDP Bangladesh Research Facility (2020). COVID-19: A reality check for Bangladesh's healthcare system. UNDP, May 3 Available at: <https://www.bd.undp.org/content/bangladesh/en/home/stories/a-reality-check-for-bangladesh-s-healthcare-system.html>. Accessed August 8, 2020. [Google Scholar]
- [23] Chowdhury T. COVID-19: Bangladesh hospitals forced to turn away patients. *Al Jazeera*. 2020 Apr;7. Available at: <https://www.aljazeera.com/news/2020/04/covid-19-bangladesh-hospitals-forced-turn-patients-200407131633280.html>. Accessed August 7, 2020.
- [24] Morol S. 79% of patients get treatment over the phone. *Daily Prothom Alo*. 2020. Available at: <https://www.prothomalo.com/bangladesh/article/1653078/>. Accessed August 7, 2020. [Google Scholar]
- [25] Centre for Disease Control and Prevention (CDC). COVID 19 [Internet]. Available from: <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/index.html>. [Accessed September 23, 2021].