Evaluation of post-COVID depression, anxiety and stress among hemodialysis patients from an urban centre of Bangladesh

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Abstract

Background: *Psychological effects of COVID-19 have been documented in different studies. Patients with end-stage renal disease (ESRD) on regular hemodialysis are more vulnerable to this effect due to economic and social burden attached to their co-morbidities. This study was designed to evaluate degree of depression, anxiety and stress in patients on maintenance hemodialysis who were COVID-19 survivors and compare it with those who never had COVID-19.*

Methods: *It was an observational study conducted among patients of ESRD getting regular hemodialysis on outdoor basis in Square Hospital. Total 156 patients were included in the study who were divided into two groups, 52 patients getting regular hemodialysis who suffered from COVID-19 in the year before study period (October, 2021 to March, 2022) were selected as COVID group and 104 age and sex matched patients of ESRD taking maintenance hemodialysis, who never had COVID-19 were taken as the non-COVID group. Data were collected via face-to-face interview and was recorded in a pre-formed two-part questionnaire with one part containing patient's demographic characteristics and the other part included the 21 questions in accordance with depression, anxiety stress scale 21 (DASS21) scale to measure the degree of depression, anxiety and stress in that individual patient.*

Results: *According to DASS21 score, prevalence of anxiety (75% versus 37.7%, P value 0.009), depression (62.5% versus 27.4%, P value 0.008) and stress (67.3% versus 40.6%, P value 0.01) in COVID group was higher than non-COVID group. Prevalence of mild and severe depression in COVID group was higher than non-COVID group. Prevalence of moderate, severe and extremely severe anxiety and all degrees of stress (mild, moderate, severe and extremely severe) were significantly higher in COVID group than non-COVID group.*

Conclusion: *Psychological burden was significantly higher among ESRD on maintenance hemodialysis following COVID-19 than similar patients who did not previously suffer from COVID-19.*

Key words: *DASS21, COVID-19, Hemodialysis.*

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Received: December 26, 2023
Revision received: April 9, 2024
Accepted: April 30, 2024

INTRODUCTION

Corona virus disease 2019 (COVID-19) is a novel infectious disease caused by severe acute respiratory syndrome corona virus 2 (SARS- CoV-2).[1] Due to its rapid global spread, the disease rapidly escalated to the category of a global pandemic, as declared by World Health Organization (WHO) on March 11, 2020.[2] To prevent disease transmission, individuals who might have been exposed to COVID-19 were quarantined to keep them separated from others to halt the spread of disease.

Recent evidence suggested that epidemics have profound effect on mental health of individuals, resulting in anxiety, depression, and even post-traumatic stress disorder (PTSD) in different population; there is growing evidence that the same was true for the recent COVID-19 pandemic.[3,4] The strict lockdown and social isolation regulations implemented had certainly disrupted the

daily lives of many people. Moreover, the lack of knowledge about COVID-19, misinformation from media, the lack of effective treatments, travel restrictions, significant economic losses, strict isolation requirements, and more importantly the alarming mortality rate lead to higher levels of depression, anxiety, and stress during COVID-19 pandemic.[5,6]

Depression is the most frequent psychological complication of hemodialysis patients and has been associated with impaired quality of life. Other psychological problems seen in this population are anxiety, sexual dysfunction, and psychosis.[7] There are multiple studies that evaluated level of depression, anxiety and stress among general population following COVID-19 pandemic from Bangladesh.[8,9] But so far there is limited evidence among patients on maintenance hemodialysis or multiple co-morbidities. In this study we aimed to evaluate level of depression, anxiety and stress in patients on maintenance hemodialysis who were COVID-19 survivor and compare the degree of depression, anxiety and stress with those who never suffered from COVID-19.

METHODS

Participants and procedure
For this study, a cross-sectional design had been done with purposive sampling. This study was carried out in dialysis center of square hospital from October 2021 to March 2022; which included patients who were on maintenance hemodialysis in this center. It was a descriptive study. Fifty two patients getting regular hemodialysis on outpatient basis in Square Hospital who suffered from COVID-19 in year preceding the study period (diagnosed by positive RT-PCR) were selected as COVID group and 104 age and sex matched patients of ESRD taking maintenance hemodialysis in the same center, who never suffered from COVID-19, were taken as non-COVID group. Patients, who were hospitalized, bedridden or who did not give consent were excluded from the study. After explaining the procedure to the participants, written consents were taken.

Data was collected via face-to-face interview and was recorded in a pre-formed questionnaire. The questionnaire had 2 parts. One part contained patient's demographic characteristics and the other part included the 21 questions in accordance with DASS21 scale to measure the levels of depression, anxiety and stress in that individual patient. The questions of DASS21 scale were translated to native Bengali language by a medical graduate and a general person who were native speakers

of Bengali but also fluent in English. An independent researcher compiled and addressed discrepancies in the Bengali translated version. The interviewer circulated the questionnaire in both English and Bengali version for proper understanding of the questions. The interviewer helped by explaining the questions further when help was needed by the patients.

Depression anxiety stress scale 21 (DASS 21)
DASS 21 is a self-report instrument for screening of depression, anxiety, stress and is widely used.[10] The scale is used to measure psychiatric co-morbidities in patients with psychological disorders, general workers, as well as health care providers during COVID-19.[11-13] It includes 21 items equally divided into 3 subscales of anxiety, stress and depression. Scores counted on a 4-point scale ranging from 0 ('never') to 3 ('always'). Subscales of stress consist of questions 1,6,8,11,12,14 and 18 and the cut off scores were normal (0-14), mild stress (15-18), moderate stress (19-25), severe stress (16-33) and extremely severe stress (34 and above). Subscales of anxiety consist of questions 2, 4,7,9,15,19 and 20, and the cut off scores were normal (0-7), mild anxiety (8-9), moderate anxiety (10-14), severe anxiety (15-19) and extremely severe anxiety (20 and above). The subscales of depression consist of questions 3,5,10,13,16,17 and 21, and the cut off scores were normal (0-9), mild depression (10-13), moderate depression (14-20), severe depression (21-27) and extremely severe depression (18 and above). In the present study we used the validated Bangla version of DASS21 (14).

Data analysis
Data were analyzed using SPSS software (version 26). Descriptive statistics were calculated to compare demographic characteristics and additional health information variables. Quantitative variables were expressed as mean, median and interquartile range (IQR). Prevalence is measured to evaluate different degrees of depression, anxiety and stress in the groups. Level of significance was considered as p-value < 0.05. P-values were calculated by chi-square test.

RESULTS

Descriptive analysis
Total 52 patients of ESRD on MHD with history of COVID-19 were included in COVID group and 104 age and sex matched patients with ESRD on MHD in the same center with no previous history of COVID-19 were taken as non-COVID group. Baseline characteristics of study population are shown in Table I.

Table I. Baseline characteristics of study population

Characteristics	COVID group (n=52)	Non-COVID group (n=104)
Age in years (Median with IQR)	59.5 (52-66)	63.5 (55-70)
Sex %	Female 67%	Female 55%
Co-morbidities		
Diabetes mellitus (DM)	7.7%	7.5%
Hypertension (HTN)	23.1%	15.1%
DM+HTN	44.2%	39.6%
DM+ HTN+ Ischemic Heart Disease (IHD)	3.8%	17.9%
DM+HTN+ IHD+ stroke	17.3%	6.7%
Duration of hemodialysis (months) mean with interquartile range (IQR)	49.1 (12-63)	34.78 (8-53)
Physical activity		
Fully mobile	76.9%	82.1%
Requires assistance for movement	19.2%	16.3%
Bed bound	3.8%	0%

According to DASS21 score, prevalence of anxiety, depression and stress in COVID and non COVID group were 75% versus 37.7.%, 62.5% versus 27.4% and 67.3% versus 40.6% with p value 0.009, 0.008 and 0.01 respectively. The findings of different levels of anxiety, depression and stress can be stated as below.

The prevalence of mild, moderate, severe and extremely severe depression in COVID and non COVID group were 17.3% versus 5.7%, 11.5% versus 15.4%, 23.1% versus 5.7% and 15.4% versus 12.4% respectively according to DASS21 score (figure-1).
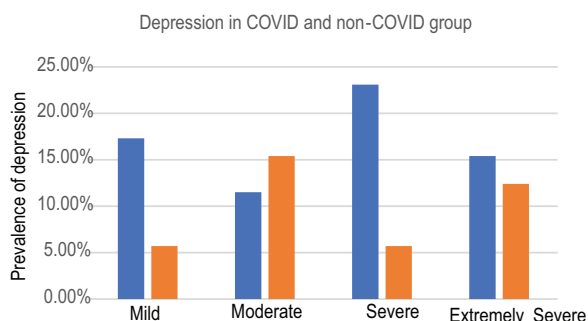

Figure 1. Bar chart showing prevalence of depression in COVID and non-COVID group. Blue bars depicting COVID group and Orange bars depicting non-COVID group.

Prevalence of mild, moderate, severe and extremely severe anxiety in COVID and non- COVID group were 5.8% versus 10.4%, 40.4% versus 9.4%, 13.5% versus 4.7% and 15.4% versus 11.3% respectively and the difference is significantly higher in COVID group except for mild anxiety (figure-2).
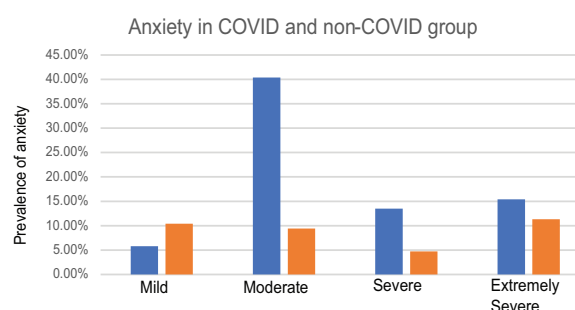

Figure 2. Bar chart depicting prevalence of anxiety in COVID and non-COVID group. Blue bars depicting COVID group and orange bars depicting non-COVID group.

The prevalence of mild, moderate, severe and extremely severe stress in COVID and non-COVID group were 13.5% versus 5.7%, 21.2% versus 6.6%, 19.2% versus 9.4% and 7.7% versus 3.8% respectively (figure-3).
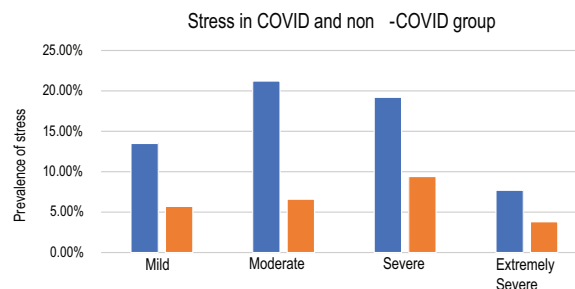

Figure 3. Bar chart showing prevalence of different level of stress in COVID and non-COVID group. Blue bars depicting COVID group and orange bars depicting non-COVID group.

Table II. Prevalence of different levels of anxiety, depression and stress in COVID and non-COVID group (in percentage) and p-values obtained from chi-squares test

	Prevalence in COVID group (%)	Prevalence in non-COVID group (%)	p-values
Depression			
Mild	17.3	5.7	.004
Moderate	11.5	15.4	.551
Severe	23.1	5.7	.000
Extremely severe	15.4	12.4	.117
Anxiety			
Mild	5.8	10.4	.651
Moderate	40.4	9.4	.001
Severe	13.5	4.7	.003
Extremely severe	15.4	11.3	.026
Stress			
Mild	13.5	5.7	.014
Moderate	21.2	6.6	.001
Severe	19.2	9.4	.018
Extremely s\evere	7.7	3.8	.028

It was observed that most of the levels of depression, anxiety and stress were significantly increased in COVID group. Here the difference between two levels of depression (i.e. moderate depression and extremely severe depression) and mild anxiety were found to be statistically non-significant in the two groups.

In case of depression, the P-values for mild and severe depression are .004 and .000 respectively which indicates mild and severe depression in COVID group is significantly higher than non-COVID group.

In case of anxiety, for moderate, severe and extremely severe anxiety, P values were .001, .002 and .026 respectively. It refers to the fact that moderate anxiety, severe and extremely severe anxiety was significantly higher for the hemodialysis patients affected by COVID-19 than non-affected patients.

In case of stress, all the levels were found to be significantly higher in COVID group than non-COVID group. Here for mild, moderate, severe, and extremely severe stress, the P values were .014, ,001, .018 and .028 respectively.

DISCUSSION

COVID-19 pandemic has taken a toll on mental health worldwide.[15] Zubayer et al. did a cross-sectional study on Bangladeshi people using DASS21 scale following COVID outbreak. The findings of the study indicate 47.2% participants had depression, 46% had anxiety and 32.5% had stress. In that study risk factors for anxiety, depression and stress were found to be the following: COVID-19 related symptoms, following COVID-19 related news daily, having relative or acquaintances die from COVID-19 and direct or indirect contact with COVID-19 patients.[8]

Another study done by Khan et al, conducted among Bangladeshi students during COVID-19 pandemic reported prevalence of depression to be 46.9%, anxiety to be 33.3% and stress to be 28.5%.[16] In our study among non-COVID group 40.6% had depression, 37.7% had anxiety and 27.4% had stress which corelates with the results of above-mentioned studies. But in COVID group the rates were significantly higher (75%, 62.5% and 67.3% respectively) which showed that having COVID-19 may be a significant contributor to disruption of mental health.

In 2017, Liu et al. conducted a study using DASS 21 scale among patients with end stage renal disease on dialysis. A total 1,332 participants were taken. Among them, the prevalence of depression was 37%, stress 48% and anxiety 20%.[17] In our study, in COVID group, the prevalence is significantly higher even compared to data found in dialysis patients.

COVID-19 pandemic had forced people to change everyday routine. Drastic changes in everyday life caused habits and schedules to alter contributing to mental health issues. Todt et al. assessed mental health of COVID-19 survivors 3 months following hospital discharge, where patients reported worsening of health-related quality of life and 43.2% reported worsening of mood compared to before onset of COVID symptoms (scored 3 or higher in PHQ-4).[18] Depression is the most frequent psychological complication of hemodialysis patients and has been associated with impaired quality of life. Other psychological problems seen in this population are anxiety, sexual dysfunction, and psychosis.[7] In this study we found COVID-19 infection as an independent factor significantly affecting the mental health of already vulnerable patients on regular hemodialysis. So, it underscores the need for strategies aimed at reducing the psychological sufferings of hemodialysis patients who are COVID-19 survivors.

This study has several limitations. First, we used a convenience sample of hemodialysis patients from only one center situated in the capital of Bangladesh, which might limit to understand the overall condition of the whole city as well as the whole country as the socio-demographic characteristics of study population might differ from the general population of the country. The second limitation was that it was not possible to record demographic data of the study population regarding any of their pre-existing mental health issues. Another limitation was about the sample size. The sample size was not large enough to clearly represent the actual psychological condition of the hemodialysis patients.

Despite these limitations, the current results provide an initial foundation for evaluating effect of post COVID of depression, anxiety and stress and their associations among the hemodialysis patients. Moreover, further studies should seek to find out the psychological effects of the different cofactors and comorbidities on different levels of post COVID depression, anxiety and stress among hemodialysis patients.

Conclusion

The findings of this study showed that COVID-19 had a significant impact on psychological morbidities in hemodialysis patients. We found statistically significant differences between most levels of depression, anxiety and stress in participants of COVID and non-COVID group.

This study will help in creating awareness of psychological burdens caused by COVID-19 among hemodialysis patients. Some steps can be taken to assess the psychological effects post COVID-19 which are often underestimated.

1. Routine psychological evaluation of hemodialysis patients following COVID-19.

2. Psychological intervention like cognitive behavioral therapy or referral to a psychiatrist/clinical psychologist if needed.

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