

Prevalence of Sleep, Stress, Anxiety and Depression among COVID-19 Survivors

Dr. Karthik Sunkenapally¹, Dr. Gattupally Nikhil Reddy², Dr. Vinayak Krishnan³

¹Assistant Professor, Department of Psychiatry, Chalmeda Institute of Medical Sciences

²Post Graduate, Department of Psychiatry, Chalmeda Institute of Medical Sciences

³Post Graduate, Department of Psychiatry, Chalmeda Institute of Medical Sciences
Corresponding Author Email: vinayak_krishnan@yahoo.com

Abstract: *The COVID-19 outbreak has produced unpredictable stress physically and mentally in all sections of population. Empirical data showed that 43.1% and 40.2% of COVID-19 patients suffer from depressive symptoms and other mental illness respectively^[1]. A hospital based cross sectional study including 100 COVID-19 survivors using DASS-21 and PSQI. Among the survivors 63% had depression, 80% had anxiety, 46% had stress and 77% had poor sleep quality and, out of them 75.8%, 88.7%, 59.6% and 93.5% respectively, had association with oxygen support during their treatment. This depicts the importance of diagnosing and managing psychiatric morbidities among survivors during the recovery phase.*

Keywords: COVID-19 survivors, quality of sleep, stress, depression, anxiety, Oxygen support, Psychiatric morbidities.

1. Introduction

The outbreak of COVID-19 due to new corona virus (SARS-CoV-2) started from Wuhan, China in December 2019 and started spreading across borders and to different continents in an unprecedented fashion which the world has never seen. Before the COVID-19 pandemic, coronavirus caused two noteworthy outbreaks: Severe Acute Respiratory Syndrome (SARS) in 2002, and Middle East respiratory syndrome (MERS), in 2012. The severe acute respiratory syndrome coronavirus (SARS-CoV) caused an epidemic in 26 countries in 2002, affecting over 8, 000 people and it was found that respiratory viral diseases are associated with both acute and long-lasting psychopathological consequences in the survivors^[2]. According to DSM-IV psychiatric disorders, incidence of psychiatric morbidities among post SARS survivors was 58.9%.^[3]

Moreover, sero-positivity for coronaviruses was associated with suicide and psychosis persisting one year after SARS outbreak^[4] and it was also being implicated in other neuropsychiatric diseases^[5]. SARS and MERS patients have been shown to experience psychiatric symptoms during their illness as well as after cure, 35% of SARS survivors in Hong Kong reported significant depressive and anxiety symptoms, four weeks or more after discharge^[6]. In MERS survivors 43% had post-traumatic stress disorder and depressive symptoms were found in 27% 12 months after recovery^[7].

India has been reporting the cases of Covid-19 since 30th January 2020 and according to WHO 450, 01, 764 cases were confirmed by 23rd November 2023^[8]. Disease severity, mode of spread and the measures placed to curb the spread of infection has changed personal life and psyche of millions around the globe, leading to increase in psychiatric disorders. 53% of COVID-19 survivors have been suffering with psychiatric comorbidities like anxiety, depression, insomnia, stress and other neuropsychiatric manifestations^[9].

Coronaviruses could induce psychopathological sequelae either by direct viral infection of the central nervous system (CNS) or indirectly via an immune response^[10]. The interaction between innate and adaptive immune systems and neurotransmitters emerged as a mechanism underpinning mood disorders, psychosis, and anxiety disorders^[11]. In addition to the immunological mechanisms, fear and severity of illness, uncertainty of the future, stigma, traumatic memories of severe illness, and social isolation experienced by Covid-19 survivors further exacerbated the psychiatric sequelae^[12]. Elderly and immunocompromised individuals, and those with pre-existing psychiatric or substance abuse issues are vulnerable to unfavourable psychosocial results. In India during the peak of pandemic when the medical infrastructure was overwhelmed there were instances of severe oxygen shortage due to limited availability and hoarding which has led to nationwide pandemonium which has further added to panic among population. Preliminary studies on COVID-19 patients then revealed that confusion and delirium are the common features in acute stage. This study aims to investigate psychopathological impact of COVID-19 in survivors during the post-illness phase at one-month follow-up.

2. Methodology

Our study was conducted at tertiary care teaching hospital which was COVID designated. This is a cross-sectional study which was carried out between 2021 April -2021 June. Our aim of the study is to find psychiatric morbidities among COVID-19 survivors and the association with the need of oxygen support during illness. Our objectives were to assess sociodemographic profile of participants, to estimate the prevalence of psychiatric morbidities like depression, anxiety, stress, estimate the quality of sleep among COVID-19 survivors and to describe the association between need for oxygen support and psychiatric morbidities. All the consecutive patients who attended COVID OPD after a month of recovery fulfilling the criteria

described below were included using purposive sampling method. We included all the participants who recovered from COVID in the past one month, participants with age above 18 years, participants who gave written informed consent and participants who can read and understand English. Participants who didn't give consent, patients below 18 years, participants with known history of psychiatric illness and respiratory illness were excluded. our sample size is 100 and during their follow up visit sociodemographic data were collected, DASS-21 and PSQI were administered on them by junior residents of the psychiatry department who were schooled to administer the scales. Statistical analysis was done by SPSS software version 20. Ethical clearance was obtained from institute ethical committee with clearance number: IEC/CAIMS/2022/008.

3. Results

100 post COVID survivors were interviewed after 1 month of recovery during their follow up visit.

Table 1: Demographic Characteristics of POST COVID SURVIVORS (N=100)

Parameters		Frequency	Percent/SD
Gender	Male	69	69
	Female	31	31
	Mean age	48.56	15.07
Marital status	Married	74	74
	Single	16	16
	Widowed	10	10
Co-morbidities	No	56	56
	HTN	16	16
	DM	9	9
	DM, HTN	13	13
	HYPOTHYROID	3	3
Substance use	HTN, DM, CVA	3	3
	Alcoholism	29	29
	Smoker	8	8
	Both	20	20
	No	43	43

The patients hailed from different villages of Karimnagar district. Out of 100 survivors 69 are male and 31 are female. Among them 74% are married, 16% single and 10% are widowed. Substance use was found in 57% survivors. 56% survivors were found with no co-morbidities.

Table 2: Severity for depression, anxiety and stress in POST COVID SURVIVORS (N=100)

Level of DASS-21 Scores		Count	Percent
Depression	Normal	37	37%
	Mild	20	20.0%
	Moderate	42	42%
	Severe	1	1%
Anxiety	Normal	20	20%
	Mild	14	14%
	Moderate	34	34%
	Severe	23	23%
Stress	Extremely Severe	9	9%
	Normal	54	54%
	Mild	19	19%
	Moderate	19	19%
	Severe	8	8%

In our study 63% survivors had depression. Majority of the them had moderate depression (42%), followed by mild depression(20%) and severe depression(1%). Only 37% survivors had normal emotional state. The anxiety levels in Covid-19 survivors is 80 %, with 9% survivors having extremely severe anxiety and only 20% having normal levels of anxiety. Stress levels in Covid-19 survivors are present in 48% of the patients, with 8% having severe stress levels. 52 % survivors having normal stress.

Table 3: Quality of Sleep in POST COVID SURVIVORS (N=100)

Gender	PSQI		
	Good Sleep	Poor Sleep	Total
Male	16(23.20)	53(76.80)	69(100)
Female	7(22.60)	24(77.40)	31(100)

The quality of sleep in post Covid-19 survivors is severely impaired with 77% having poor quality sleep and only 23 % having good quality of sleep.

Table 4: Association of Oxygen support and severity of depression, anxiety and stress in Post Covid-19 survivors (N=100)

Depression Level	O2 Support			Chi-square	P-value
	Yes	No	Total		
Normal	15(15)	22(22)	37	16.37	<0.001
Mild	11(11)	9(9)	20		
Moderate	35(35)	7(7)	42		
Severe	1(1)	0(0)	1		
Total	62(62)	3(38)	100		
Anxiety Level	O2 Support			Fisher Exact	P-value
	Yes	No	Total		
Normal	7(7)	13(13)	20	15.74	0.003
Mild	5(5)	9(9)	14		
Moderate	25(25)	9(9)	34		
Severe	18(18)	5(5)	23		
Extremely severe	7(7)	2(2)	9		
Total	62(62)	3(38)	100		
Stress Level	O2 Support			Fisher Exact	P-value
	Yes	No	Total		
Normal	25(25)	29(29)	54	16.65	0.001
Mild	12(12)	7(7)	19		
Moderate	17(17)	2(2)	19		
Severe	8(8)	0(0)	8		
Total	62(62)	3(38)	100		

Out of 100 Covid-19 survivors 62 % needed oxygen support, out of which 75.8% (47) survivors had depression, 88.7%(55) had anxiety and 59.6%(37) had stress. The 'P' value was found to be significant showing the association between the need of oxygen with depression, anxiety and stress.

Table 5: Association of Oxygen support and Quality of Sleep in Post Covid-19 survivors (N=100)

Sleep	O2 Support			Chi-square	P-value
	Yes	No	Total		
Good Sleep	4(4)	19(19)	23(23)	25.22	<0.001
Poor Sleep	58(58)	19(19)	77(77)		

Out of 100 COVID-19 survivors 62 % needed oxygen support, out of which 93.5%(58) had poor quality of sleep. The 'P' value was found to be significant showing the association between the need of oxygen with sleep.

4. Discussion

We discovered that a high percentage of patients diagnosed with the COVID-19 continued to experience substantial percentage of psychiatric morbidities after one month of recovery. Our study did not show any significant association with respect to marital status, substance use and associated physical co-morbidities.

In our study 100 survivors were recruited, out of which 63% survivors experienced depression. Among which 20% had mild depression, 42% had moderate depression and 1% of the survivors experienced severe depression. Our study also suggested that 80% of the survivors presented with anxiety. Among which 14% had mild anxiety, 34% had moderate anxiety, 23% had severe anxiety, where as 9% experienced extremely severe anxiety.

In one of his study done by Jrgeddes.et.al^[13] stated that the most frequent psychiatric diagnosis after Covid-19 was anxiety disorder and the same finding were replicated in our study. In another study, one-third of the patients with COVID-19 infection reported clinically significant anxiety and/or depression, at a median of 46 days after the virus clearance. Moreover 46% survivors had stress and among them 19% were with mild stress, 19% with moderate stress and 8% had severe stress. Not much study has been done on levels of stress among Covid-19 survivors, which needs to be evaluated further. A high percentage of Covid-19 survivors had poor quality of sleep (77%). However, in another study done by Mario Gennaro Mazza et al, depicted that 40% had poor quality of sleep^[14].

Our study also suggested that 62% Covid-19 survivors who were administered oxygen support during In-patient treatment had 75.8% (47) depression, 88.7%(55) anxiety and 59.6%(37) stress. There is a significant association between oxygen support required during the In-patient treatment and depression, anxiety and stress after the recovery. This may be due to the information overload on the patient by the media (TV's, Social media, Radio) in regards to oxygen requirement and prognosis of the treatment, putting the patient under immense stress that could have further extrapolated even after the remission. As there is a direct association of quality of sleep with depression, anxiety and stress, significance was also noted in regards to quality of sleep.

5. Conclusion

Our study provides evidence of psychiatric morbidity in one month after COVID-19 infection. The research showed that surviving COVID-19 is not necessarily a satisfactory health outcome. Considering the disturbing impact of COVID-19 virus on mental health, we presently recommend assessing psychopathology of COVID-19 survivors, to analyse and treat new psychiatric conditions, checking their changes over time, with the point of diminishing the illness burden, which is anticipated to be exceptionally high in patients with psychiatric conditions. Particularly for vulnerable populations, and the strengthening of social capital to reduce the Adverse Psychological impact of the outbreak.

6. Limitations

- 1) Patients who were under invasive ventilator and patients who were Covid-19 positive and had milder symptoms and did not require hospitalization were not a part of this study.
- 2) Sample does not represent the whole population as the sample size is small and purposive sampling technique was used.
- 3) The extrapolation is questionable as it is a single center study.

Hence there is a further need to assess, if oxygen support is a risk factor for psychiatric morbidities.

References

- [1] Xie Q, Liu XB, Xu YM, Zhong BL. Understanding the psychiatric symptoms of COVID-19: a meta-analysis of studies assessing psychiatric symptoms in Chinese patients with and survivors of COVID-19 and SARS by using the Symptom Checklist-90-Revised. *Transl Psychiatry*. 2021 May 17;11(1):290.
- [2] Luo Y, Chua CR, Xiong Z, Ho RC, Ho CSH. A Systematic Review of the Impact of Viral Respiratory Epidemics on Mental Health: An Implication on the Coronavirus Disease 2019 Pandemic. *Front Psychiatry*. 2020 Nov 23;11:565098.
- [3] Mak IW, Chu CM, Pan PC, Yiu MG, Chan VL. Long-term psychiatric morbidities among SARS survivors. *Gen Hosp Psychiatry*. 2009 Jul-Aug;31(4):318-26. doi: 10.1016/j.genhosppsy.2009.03.001. Epub 2009 Apr 15.
- [4] Okusaga O., Yolken R.H., Langenberg P. Association of seropositivity for influenza and coronaviruses with history of mood disorders and suicide attempts. *J. Affect Disord*. 2011;130:220–225.
- [5] Rogers J.P., Chesney E., Oliver D. Psychiatric and neuropsychiatric presentations associated with severe coronavirus infections: a systematic review and meta-analysis with comparison to the COVID-19 pandemic. *Lancet Psychiatry*. 2020.
- [6] Cheng SK, Wong CW, Tsang J, Wong KC. Psychological distress and negative appraisals in survivors of severe acute respiratory syndrome (SARS). *Psychol Med* 2004;34(7):1187–1195.
- [7] Park HY, Park WB, Lee SH, Kim JL, Lee JJ, Lee H, et al. Posttraumatic stress disorder and depression of survivors 12 months after the outbreak of Middle East respiratory syndrome in South Korea. *BMC Public Health* 2020;20(1):605.
- [8] <https://www.who.int/countries/ind/>
- [9] Dar SA, Dar MM, Sheikh S, Haq I, Azad AMUD, Mushtaq M, Shah NN, Wani ZA. Psychiatric comorbidities among COVID-19 survivors in North India: A cross-sectional study. *J Educ Health Promot*. 2021 Aug 31;10:309.
- [10] Wu Y, Xu X, Chen Z, Duan J, Hashimoto K, Yang L, Liu C, Yang C. Nervous system involvement after infection with COVID-19 and other coronaviruses. *Brain Behav Immun*. 2020 Jul; 87:18-22.
- [11] Najjar S., Pearlman D.M., Alper K. Neuroinflammation and psychiatric illness. *J. Neuroinflamm*. 2013; 10:43.

- [12] Brooks S.K., Webster R.K., Smith L.E. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *Lancet*. 2020; 395:912–920.
- [13] Taquet, Maxime & Luciano, Sierra & Geddes, John & Harrison, Paul. (2020). Bidirectional associations between COVID-19 and psychiatric disorder: retrospective cohort studies of 62 354 COVID-19 cases in the USA. *The Lancet Psychiatry*. 8. 10.1016/S2215-0366(20)30462-4.
- [14] Mazza, M. G., De Lorenzo, R., Conte, C., Poletti, S., Vai, B., Bollettini, I., Melloni, E., Furlan, R., Ciceri, F., Rovere-Querini, P., COVID-19 BioB Outpatient Clinic Study group, & Benedetti, F. (2020). Anxiety and depression in COVID-19 survivors: Role of inflammatory and clinical predictors. *Brain, behavior, and immunity*, 89, 594–600.

Author Profile



Dr. Karthik Sunkenapally, completed MBBS from SVS Medical college, MD Psychiatry from CAIMS Karimnagar, currently practising as Assistant professor in Department of Psychiatry CAIMS. Field of interest is Adult psychiatry.



Dr. G Nikhil Reddy completed MBBS from Prathima Institute of Medical sciences Karimnagar, currently pursuing MD psychiatry from CAIMS Karimnagar. Field of interest is Adult psychiatry.



Dr. Vinayak Krishnan completed MBBS from Government Medical college Thiruvananthapuram, currently pursuing MD Psychiatry from CAIMS Karimnagar. Field of interest is Addiction and Adult psychiatry.