International Journal of Research in Medical Sciences
Shah A et al. Int J Res Med Sci. 2023 Nov;11(11):4170-4175
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20233394

Original Research Article

Similar prevalence of anxiety and depression symptoms in any ICU survivor patient relative

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Received: 11 September 2023
Revised: 10 October 2023
Accepted: 11 October 2023

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ABSTRACT

Background: Iwashyna et al defined a chronic critically ill (CCI) patient as any patient requiring care in ICU for more than or equal to 10 days. Physicians often assume that the prevalence of anxiety and depression symptoms in relatives of CCI patients would be higher than in those patients who are not CCI. We hypothesized that there would be no difference in the prevalence of anxiety and depression symptoms of relatives of a CCI and those whose patients are not CCI. We aimed to establish that the prevalence of anxiety and depression symptoms are similar in relatives of any ICU survivor patient.
Methods: The study was a non-interventional, observational, cross-sectional study. Relatives were evaluated as early as possible after day ten following ICU admission for CCI patients and non-CCI patients on or a day before discharge from ICU. During this evaluation, anonymous demographic data of relatives were captured, and PHQ-9 and GAD-7 scales were administered and completed by the relative.
Results: A total of 418 relatives consented and were included in the study [104 in CCI patient group and 314 in non-CCI group]. Overall, the prevalence of anxiety and depression symptoms in the entire study cohort was 23.2% (95% CI, 19.4-27.5) and 16.5% (95% CI, 13.2-20.4), respectively. There was no statistical difference between the two groups in the proportion of PHQ-9 total score >9 (p value: 0.577) as well as the GAD-7 total score (p value: 0.816).
Conclusions: There was no difference in the prevalence of anxiety and depression symptoms in relatives of a CCI versus those whose patients are not CCI.

Keywords: Anxiety, Chronic critically ill, Depression, Family, PICS-F, Relative

INTRODUCTION

Hospitalization in the intensive care unit (ICU) is a stressor for family caregivers (hereafter referred to as relatives).[1] Relatives are essential partners in providing care to ICU survivors.[2] Nearly 90% of long-term care to ICU survivors is provided by a relative.[2] Acute and chronic psychiatric distress that the relative of an ICU patient experiences was termed post-intensive care syndrome family (PICS-F) by the society of critical care medicine.[3,4] PICS-F negatively impacts relatives' mental health-related quality of life.[2]

More than two-thirds of the relatives of ICU patients experience anxiety and depression symptoms.[5] Anxiety or depression symptoms can start early following the admission of their patient to the ICU.[6] During the first 48 hours following an ICU admission, uncertainty is expected, and relatives have inadequate time to adapt.[7] One study found that the prevalence of anxiety or depression symptoms in relatives of patients admitted for

less than 48 hours was no different from those admitted for longer than 48 hours.[7]

Iwashyna et al defined a chronic critically ill (CCI) patient as any patient requiring care in ICU for more than or equal to 10 days.[8] Physicians often assume that the prevalence of anxiety and depression symptoms in relatives of CCI patients would be higher than in those patients who are not CCI (hereafter referred to as non-CCI). There are no published studies to empirically either support or negate such an assumption. Studies have consistently shown that caregiver-related and not patient-related factors play a significant role in developing PICS-F.[9]

We hypothesized that the prevalence of anxiety and depression symptoms would not differ between the relative of a CCI patient versus a patient discharged from ICU who is non-CCI.

METHODS

The hospital's institutional ethics committee approved this study. The study was a non-interventional, observational, cross-sectional study conducted in the ICU of Sir H. N. Reliance Foundation hospital, Mumbai, India. The study was conducted in compliance with the principles of ICH-GCP. Relatives were included in the study from 7th February 2022 until 2nd November 2022.

The 54 bedded ICU unit in the hospital has a turnover of 3600 patients in a year. The proportion of cases admitted in the ICU for medical causes is around 40% to 45%, and for surgical causes is around 60% to 65%. The majority of the patients stay for an average length of 3.5 to 4 days. 60% of patients pay out of pocket, while 40% of patients are covered by their health insurance provider. Only one relative is allowed to stay with the patient per hospital policy. A close family member would be the healthcare proxy for the patient. This relative would be selected for participation in the study.

Relatives aged 18 years and above who could read and write in either English, Hindi, Marathi, or Gujarati and whose patient was 18 years and above with an ICU stay of more than 24 hours were eligible for inclusion in the study. Relatives whose patients expired or those who had previously participated in the study, or those who were paid caregivers of the patient were all excluded from the study.

Patients planned for discharge with ICU stay of less than ten days and those patients staying in ICU for ten or more days were identified by the ICU research team member. The ICU study team members would alert the psychiatrist study team members in the morning when a patient was scheduled for discharge or transfer to the ward during the day from the ICU. Relatives who showed preliminary interest in participating in the study were provided by the psychiatrist study team member with written information and a consent form. If a relative agreed to participate, informed consent was taken by the investigator. The relative was evaluated by either psychiatrist research team members as early as possible after day ten following ICU admission for CCI patients and non-CCI patients on or a day before discharge from ICU. During this evaluation, anonymous demographic data of relatives were captured on the paper case report form, and PHQ-9 and GAD-7 scales were administered and completed by the relative.

Patients' Acute Physiology and Chronic Health Evaluation score II (APACHE II) score within 24 hours of admission was calculated by the ICU physician research team member. APACHE II utilizes a point score based upon initial values of 12 routine physiologic measurements, age, and previous health status to measure disease severity. An increasing score (ranging from 0 to 71) is closely associated with the subsequent risk of hospital death.[10]

The patient health questionnaire 9-item version (PHQ-9) and generalized anxiety disorder 7-item version (GAD-7) scales were used to detect symptoms of depression and anxiety, respectively. The PHQ-9 has nine items, each scoring 0 to 3, with a 0 to 27 severity score. Scores 5, 10, 15, and 20 (maximum possible score of 27) represent cut-offs for mild, moderate, moderately severe, and severe depression, respectively. Using a cut-off score of 10 or greater to indicate clinically significant depression symptoms, the PHQ-9 has a sensitivity and specificity of 88%.[11,12]

The GAD-7 has seven items, each scoring 0 to 3, with a 0 to 21 severity score. The GAD-7 items represent the DSM-IV criteria for generalized anxiety disorder. Scores of 5, 10, and 15 (maximum possible score of 21) represent cut-offs for mild, moderate, and severe anxiety, respectively. Using a cut-off score of 10 or greater to indicate clinically significant anxiety symptoms, the GAD-7 has a sensitivity of 89% and specificity of 82%.[13]

The translated versions of the PHQ-9 and GAD-7 are available from the open-source website https://www.phqscreeners.com/select-screener. Both these scales are widely used in research and practice settings. Both scales have been extensively validated and used to test for depression and anxiety; they are simple, self-rated, can be completed in 2 to 5 minutes each, and have been proven to be a sensitive screening tool.[12,14]

Independent variables were relatives' age, gender, education, marital status, employment status, and chronic medical/psychiatric illnesses. Dependent variables were anxiety and depression symptoms in relative.

This study's primary objective was to establish that the prevalence of anxiety and depression symptoms are similar in relatives of CCI and non-CCI ICU patients. The secondary objective of this study was to check if any

variables correlate with higher anxiety and or higher depression symptoms experienced.

The sample size was calculated for the study using the following parameters: $\alpha = 0.05$, Power $(1-\beta) = 0.80$, and allocation ratio as 1:3. Based on this, the estimated sample size was 376. The total sample size allowing for a 10 percent compensation was 418 [104 samples in the CCI patient group and 314 in the non-CCI patient group. Continuous variables were expressed as mean & standard deviation, and categorical data were expressed as numbers and percentages. Categorical variables were compared using the $\chi 2$ test. Fisher's exact test was employed instead of the $\chi 2$ test when >20% of cells had expected frequencies <5. A two-tailed P-value of <0.05 was considered statistically significant for all analyses. All statistical analyses were performed using STATA 15 (StataCorp. 2017. Stata Statistical Software: Release 15. College Station, TX: StataCorp LLC).

RESULTS

Study participants were recruited during weekdays over a 268-day study recruitment period. 583 relatives in total were approached for the study. 165 relatives refused participation. A total of 418 relatives consented and were included in the study, out of which 104 had a CCI patient in the ICU while 314 had a non-CCI patient in the ICU.

Table 1 shows the key sociodemographic variables between relatives of the CCI and non-CCI groups. Overall, the mean age of a relative participating in the study was 43.7 (SD, 13.1) years, with the majority being males (56.2%), cohabiting with the patient (73.9%), and having a graduate level of education (48.1%). In both CCI and non-CCI groups, approximately 56 percent of the relatives were male. In both groups, almost half of the relatives were adult children of the patients. In the non-CCI group, approximately 34 percent of the relatives were spouses, just 19 percent in the CCI group. Also, there was not much difference between the groups in the proportion of cohabitation with the patient. In both groups, approximately 3 out of 4 relatives cohabitate with the patient. Education level among the relatives was high in both groups. The proportion of relatives employed in the non-CCI group was slightly lower (65.92 percent) compared to 71.15 percent in the CCI group. The marital status of relatives was almost similar in both groups. Nearly one-third of the relatives had some chronic medical condition and were on medication for the same. However, the proportion was slightly higher in the non-CCI group.

Table 1: Sociodemographic variables of the cci and non-CCI group relatives.

Variables	Chronic-critically Ill (CCI)				Total		P value
	No		Yes				
	N	%	N	%	N	%	
ICU patient's gender							0.755
Female	114	36.3	36	34.6	150	35.9	
Male	200	63.7	68	65.4	268	64.1	
Study relative's gender							0.301
Female	142	45.2	41	39.4	173	43.8	
Male	172	54.8	63	60.6	224	56.2	
Relationship with patient							0.006
Spouse	106	33.8	20	19.2	126	30.1	
Sibling	17	5.4	13	12.5	30	7.2	
Parent	8	2.5	6	5.8	14	3.3	
Adult child	150	47.8	50	48.1	200	47.8	
Others	33	10.5	15	14.4	48	11.5	
Cohabitation with patient							0.317
No	78	24.8	31	29.8	109	26.1	
Yes	236	75.2	73	70.2	309	73.9	
Highest education level							0.970
School	35	11.1	10	9.6	45	10.8	
High School	37	11.8	12	11.5	49	11.7	
Diploma	7	2.2	1	0.9	8	1.9	
Graduate	150	47.8	51	49.0	201	48.1	
Postgraduate	84	26.7	30	28.8	114	27.3	
Doctorate	1	0.3	0	0.0	1	0.2	
Employment status							0.225
Unemployed	2	0.6	0	0.0	2	0.5	
Homemaker	82	26.1	18	17.3	100	23.9	
Retired	11	3.5	6	5.8	17	4.1	

Continued.

Variables	Chronic-critically Ill (CCI)				Total		P value
	No		Yes				
	N	%	N	%	N	%	
Employed	207	65.9	74	71.1	281	67.2	
Other	12	3.8	6	5.8	18	4.3	
Marital status							0.973
Unmarried	63	20.1	21	20.2	84	20.1	
Married	246	78.3	83	79.8	329	78.7	
Divorced	1	0.3	0	0.0	1	0.2	
Separated	1	0.3	0	0.0	1	0.2	
Widowed	3	0.9	0	0.0	3	0.7	
Chronic medical conditions in relative							0.297
No	206	65.61	74	71.2	280	66.9	
Yes	108	34.39	30	28.8	138	33.0	
On-going medication by relative							0.345
No	214	68.15	76	73.1	290	69.4	
Yes	100	31.85	28	26.9	128	30.6	
Substance dependence in relative							0.902
No	297	94.89	99	95.2	396	95.0	
Yes	16	5.11	5	4.81	21	5.0	
PHQ-9 score> 9							0.577
No	264	84.08	85	81.7	349	83.5	
Yes	50	15.92	19	18.3	69	16.5	(13.2, 20.4)
GAD-7 score>9							0.816
No	242	77.07	79	76.0	321	76.8	
Yes	72	22.93	25	24.0	97	23.2	(19.4, 27.5)
Total	314		104		418		

Table 2: The mean difference in selected covariates between CCI and non-CCI relative groups.

Variables	Chronic-critically Ill				Total	
	No		Yes			
	Mean	SD	Mean	SD	Mean	SD
Patient's age	59.78	13.83	59.19	16.45	59.63	14.51
APACHE II score	9.83	5.84	16.22	6.94	11.42	6.72
Relative's Age	43.92	13.55	43.20	11.78	43.74	13.12
Relative's BMI	27.33	4.81	26.55	4.71	27.14	4.79
PHQ-9 total score	5.10	4.75	5.63	5.32	5.23	4.90
GAD-7 total score	5.75	5.47	6.21	5.46	5.86	5.47

Overall, the prevalence of anxiety and depression symptoms in the entire study cohort was 23.2% (95% CI, 19.4-27.5) and 16.5% (95% CI, 13.2-20.4), respectively. Also, 18.3 percent of relatives in the CCI group had a PHQ-9 total score of 10 or more, while it was 15.92 percent in the non-CCI group. However, there was no statistical difference between the two groups in the proportion of PHQ-9 total score>9 (p value: 0.577). Similarly, the GAD-7 total score of 10 or more was 24 percent in the CCI group compared to 22.93 percent in the non-CCI group (p-value: 0.816).

Table 2 shows the difference in mean between selected covariates in the two groups. The mean age of the patient in the ICU for both groups was approximately 60 years. The mean APACHE II score in the non-CCI patient was 9.8, while it was 16.2 in the CCI patient. The median length of patients' ICU stay for the CCI group was 11 (IQR 2) days and for the non-CCI group was 3 (IQR 3) days. Relatives' mean age was 43.9 years in the non-CCI group and 43.2 in the CCI group. There was not much difference between the two groups for relatives' BMI. The mean PHQ-9 total score was 5.1 (SD: 4.75) in the non-CCI group and 5.6 (SD: 5.32) in the CCI group. However, the two groups had no statistically significant mean difference (p-value: 0.449). GAD-7 total score was 5.7 (SD: 5.47) in the non-CCI group and 6.2 (SD: 5.4) in the CCI group. Similarly, the two groups had no statistically significant difference in the GAD-7 total score (p value: 0.294).

DISCUSSION

This study found that the prevalence of clinically significant levels of anxiety and depression symptoms were similar in relatives of both CCI and non-CCI ICU survivor patients. This is in line with previous studies, which had similar findings that the duration of hospitalisation did not make a difference in the prevalence of anxiety and depression symptoms in relatives of ICU patients.[7,15] This study's results reiterated that patient-related factors do not play a significant role in developing PICS-F. Healthcare system-related elements may be necessary for the development of PICS-F. However, they are potentially modifiable.[9] This study adds to the existing literature that relatives of patients in ICU experience a high prevalence of depression and anxiety. Most existing literature on PICS-F originates from the USA or other developed western world countries.[16] Hence this study adds data about the prevalence of anxiety and depression symptoms in relatives of ICU survivor patients in India.

One study reported that more than two-thirds of the relatives visiting patients in the ICU demonstrate symptoms of anxiety and depression.[17] Prevalence rates of anxiety and depression among relatives of ICU patients are variable - for anxiety (range, 2%-80%) and depression (range, 4%-94%).[18] The prevalence of anxiety and depression in this study aligns with the previously available literature. A longitudinal study on one-year outcomes in relatives of critically ill patients found that clinically significant depressive symptoms can persist for up to one year in some relatives after discharge from ICU.[19] Relatives are described as hidden patients. Attention should be paid to their health and well-being. When indicated, appropriate interventions can improve the relative's well-being and benefit the patient. Depressed relatives can experience a higher burden.[20]

This study found that almost half of the relatives were adult children of the ICU patient, and nearly 74% of relatives cohabited with the ICU patient. This is in keeping with the traditional Indian family structure where three generations often live together. Typically, the family would have one or more persons above 60 years of age, one below 18 and two other family members aged between.[21] The traditional Indian family system is a source of great support to the patient and can absorb additional caregiving roles.[22] Family collectivism helps decision-making, interdependence, and responsibility sharing.[23]

This study has several strengths. This study had a relatively large sample size. The study used validated tools to measure depression and anxiety. These tools (the PHQ-9 and GAD-7) have demonstrated adequate sensitivity and specificity in previous studies, minimising the risk of miscategorising clinically significant depression and anxiety symptoms. This study was conducted in a large tertiary care private hospital with an annual ICU admission rate of >3000 patients, which included a different critically ill population in our sample. The study data was collected from the relative of a non-CCI patient at the time of discharge from the ICU. This methodology may potentially have allowed capturing the development of anxiety and depression symptoms during the period of the patient's ICU stay.

This study has limitations to consider. This study was conducted in a single centre, which may limit the generalizability to other settings. This study utilized cross-sectional data. Thus we cannot determine the prevalence of depression or anxiety in the long term for relatives of both CCI and non-CCI patients. Some relatives who refused to participate or were not selected in this study may have depression or anxiety symptoms and potentially could have affected the study results. All questionnaire measures were self-reported, which could lead to misclassifying clinically significant depression and anxiety symptoms. An individual could choose not to report anxiety or depression symptoms due to fear or stigma associated with psychiatric disorders. The chance of such underreporting was minimised by giving participants the questionnaires to complete themselves and assuring the confidentiality of information. The hospital where the study was conducted is a COVID-free hospital. This policy mandated that only one relative could visit the patient, and the visiting hours were restricted. This could have limited the potential to have a family member who could be potentially experiencing anxiety or depression symptoms. The exclusion of relatives whose patients died in the ICU, as well as the exclusion of healthcare system-related factors like communication between ICU staff and family members, are the other limitations of this study.

CONCLUSION

Variables within an individual largely determine if they experience distressing anxiety and/or depression symptoms. The duration of the patient's ICU stay would not be the sole determinant for anxiety and depression symptoms experienced by the relative. We recommend systematically screening early on following admission, using validated scales like GAD-7 and PHQ-9, to detect clinically significant levels of anxiety and/or depression symptoms in relatives of all ICU patients. Consultation liaison with the hospital psychiatry team is recommended for relatives whose PHQ-9 and/or GAD-7 total scores are greater than 9. This would be helpful to improve overall quality care for relatives of ICU survivor patients.

Recommendations

Prevalence of anxiety and depression symptoms are similar in relatives of any ICU survivor patient irrespective of length of stay of patient in the ICU. We recommend systematic screening of relatives early on following their patients' ICU admission, using validated scales like GAD-7 and PHQ-9 for checking presence of

anxiety and depression symptoms respectively. Consultation liaison with the hospital psychiatry team is recommended for relatives whose PHQ-9 and/or GAD-7 total scores are greater than 9. This would be helpful to improve overall quality care for relatives of ICU survivor patients.

ACKNOWLEDGEMENTS

Authors would like to thank Mr. Shreyans Rai, Biostatistician, Sir H. N. Reliance Foundation Hospital Mumbai for assistance with statistical analysis plan and statistical analysis.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee of Sir H. N. Reliance Foundation Hospital Mumbai, Maharashtra, India

REFERENCES

1. Chang PY, Chang TH, Yu JM. Perceived stress and social support needs among primary family caregivers of ICU Patients in Taiwan. Heart Lung. 2021;50(4):491-8.
2. Van Sleeuwen D, Van de Laar F, Geense W, Van den Boogaard M, Zegers M. Health problems among family caregivers of former intensive care unit (ICU) patients: an interview study. BJGP Open. 2020;27(4):4.
3. Davidson JE, Jones C, Bienvenu OJ. Family response to critical illness: postintensive care syndrome-family. Crit Care Med. 2012;40(2):618-24.
4. Rawal G, Yadav S, Kumar R. Post-intensive care syndrome: An overview. J Translat Int Medi. 2017;5(2):90-2.
5. Pochard F, Darmon M, Fassier T, Bollaert PE, Cheval C, Coloigner M, et al. Symptoms of anxiety and depression in family members of intensive care unit patients before discharge or death. A prospective multicenter study. J Crit Care. 2005;20(1):90-6.
6. Haines KJ, Denehy L, Skinner EH, Warrillow S, Berney S. Psychosocial outcomes in informal caregivers of the critically ill: A systematic review. Crit Care Medi. 2015;43(5):1112-20.
7. Hwang DY, Yagoda D, Perrey HM, Currier PF, Tehan TM, Guanci M, et al. Anxiety and depression symptoms among families of adult intensive care unit survivors immediately following brief length of stay. J Crit Care. 2014;29(2):278-82.
8. Iwashyna TJ, Hodgson CL, Pilcher D, Bailey M, van Lint A, Chavan S, et al. Timing of onset and burden of persistent critical illness in Australia and New Zealand: a retrospective, population-based, observational study. Lancet Resp Med. 2016;4(7):566-73.
9. Serrano P, Kheir Y, Wang S, Khan S, Scheunemann L, Khan B. Aging and postintensive care syndrome-family: a critical need for geriatric psychiatry. Am J Geriatr Psych. 2019;27(4):446-54.
10. Knaus W, Draper EA, Wagner DP, Zimmerman JE. APACHE II: a severity of disease classification system. Crit Care Medi. 1985;13(10):818-29.
11. Kroenke K, Spitzer R, Williams J. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med. 2001;16(9):606-13.
12. Kroenke K, Spitzer R. The PHQ-9: a new depression diagnostic and severity measure. Psychiatric Annals. 2002;32(9):509-21.
13. Seo J, Park S. Validation of the generalized anxiety Disorder-7 (GAD-7) and GAD-2 in patients with migraine. J Headache Pain. 2015;16(1):97.
14. Spitzer RL, Kroenke K, Williams JBW, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. Arch Inter Medi. 2006;166(10):1092-7.
15. Bialek K, Sadowski M. Stress, anxiety, depression and basic hope in family members of patients hospitalised in intensive care units-preliminary report. Anaesthesiology Inten Ther. 2021;53(2):134-40.
16. Paul N, Albrecht V, Denke C, Spies CD, Krampe H, Weiss B. A decade of post-intensive care syndrome: a bibliometric network analysis. Medicina. 2022;58(2):170.
17. Pochard F, Azoulay E, Chevret S, Lemaire F, Hubert P, Canouï P, et al. Anxiety and depression in family members of ICU patients: ethical considerations regarding decision-making capacity. Crit Care. 2000;4(Suppl 1):233.
18. Brauchle M, Nydahl P, Pregartner G, Hoffmann M, Jeitziner MM. Practice of family-centred care in intensive care units before the COVID-19-pandemic: A cross-sectional analysis in German-speaking countries. Intensive Crit Care Nurs. 2022;68:103-39.
19. Cameron JI, Chu LM, Matte A, Tomlinson G, Chan L, Thomas C, et al. One-year outcomes in caregivers of critically ill patients. N Engl J Med. 2016;374(19):1831-41.
20. Olagundoye O, Alugo M. Caregiving and the Family. In: Caregiving and Home Care. Mollaoglu M. IntechOpen; 2018.
21. Vahia VN, Shah AB. COVID-19 pandemic and mental health care of older adults in India. Int Psychogeriatr. 2020;32(10):1125-7.
22. Makasare MP. Mental Health First Aid and Indian Family System: A Comparative Overview. Ann Roman Soci Cell Biol. 2021:7138-46.
23. Chadda RK, Deb KS. Indian family systems, collectivistic society and psychotherapy. Indian J Psych. 2013;55(Suppl 2):S299-S309.

Cite this article as: Shah A, Shah A, Rathod D, Patel M, Hansora S. Similar prevalence of anxiety and depression symptoms in any ICU survivor patient relative. Int J Res Med Sci 2023;11:4170-5.