Original Research Article

Prevalence and risk factors of generalized anxiety disorder among adult COVID-19 survivors in Cuddalore district, Tamil Nadu

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ABSTRACT

Background: The infectious disease pandemic (COVID-19) has not only affected the physical health but also the psychosocial health of the infected population by increasing anxiety and stress. Our aim of this study is to estimate the generalized anxiety disorder (GAD) among the COVID-19 survivors in Cuddalore district, Tamil Nadu.
Methods: A community-based descriptive cross-sectional study was carried out among 330 COVID-19 survivors in Cuddalore district, Tamil Nadu during December 2021 to May 2022. A predesigned and pretested, semi-structured proforma was used to collect data about the basic socio-demographic variables and COVID-19 infection related variables. A standardised 7 item GAD scale (GAD 7) was used for screening symptoms of anxiety. The presence of symptoms of anxiety was defined by a GAD 7 score of 8 and above. A p<0.05 was considered statistically significant.
Results: Out of 330 study participants, 15.8% of them had symptoms of anxiety with GAD 7 score of >8. We found significant level of anxiety with age, female gender, marital status, socio-economic status, and presence of co-morbidity, Similarly, COVID-19 related factors like duration of hospital stay, family members either being affected or died due to COVID-19 infection were significantly associated with high level of anxiety.
Conclusions: During this COVID-19 pandemic, the symptoms GAD was much higher among the COVID-19 survivors. A timely diagnosis and management are essential, by creating awareness at all levels of health care personal in the health system.

Keywords: GADs, COVID-19 survivors, Pandemic, Cuddalore

INTRODUCTION

The COVID-19 infection which was declared as a pandemic by WHO in March 2020 has affected the physical, mental and social wellbeing of people around the world.[1] As of June 2022, there are 532,887,351 confirmed cases of COVID-19, including 6,307,021 deaths, reported to WHO. India has reported 43,230,101 confirmed cases of COVID-19 and 524,771 deaths.[2] All possible measures were taken to contain the disease and to reduce its spread like quarantine and lockdown, restricting the movement of the people. However, restrictions of social interaction, severity of the infection and increasing mortalities due to COVID-19 had a negative impact on the psychological well-being of the individuals and the whole society.[3] Those infected by COVID-19 have experienced feeling of trauma due to hospitalization, isolation and stigmatization from family and friends after released or recovered from quarantine or isolation due to the very nature of the virulent virus.

GAD is one of the most common mental disorders, which produces fear, worry, and a constant feeling of being

overwhelmed. It is characterized by persistent, excessive, and unrealistic worry about everyday chores. These worries could be a multifocal such as health, family, finance, and the future. It is excessive, difficult to control, and is often accompanied by many non-specific psychological and physical symptoms and the prominent feature is excessive worry.[4] Worldwide, one of the leading causes of health burden was a mental disorder such as anxiety and depression before 2020. The emergence of the COVID-19 pandemic has further created an environment causing unusual disruption, panic and stress in every aspect of human living condition worsening the mental health.[5] Therefore, the long term psychological consequences due to COVID-19 infection should be considered among vulnerable population. Anxiety disorder is one of the most frequently diagnosed psychiatric disorder in COVID-19 survivors.[6]

Therefore, the need for up-to-date information on the mental health impacts of COVID-19 is important in preparing the health system to take appropriate responses. Hence, this study, is to estimate the prevalence of the GAD and to find out associated risk factors among adult COVID-9 survivors in Cuddalore district of Tamil Nadu, India.

METHODS

Study design and area

A community-based, descriptive cross-sectional study was conducted in Cuddalore district of Tamil Nadu, India. Cuddalore district consists of 14 Panchayat unions (Blocks) and 63 Primary health centres (PHCs) with a total population of 2605914. This study was carried out over a period of 6 months from December 2021 to May 2022.

Sample size and sampling technique

This study is a part of dissertation work.Sample size was calculated based on the prevalence of post-traumatic stress disorder among Italian population in COVID-19 pandemic was found to be 29%.[7] Taking this as prior information and by using nMaster software, 317 participants required for estimating the expected proportion with 5% absolute precision and 95% confidence. The study was conducted among 330 participants. Out of fourteen blocks of Cuddalore health unit district, five blocks were selected and from each selected block one PHC was selected for convenience. COVID-19-line list were collected from each selected block. The participants, 66 were selected each from the five selected PHCs by using simple random sampling method (Figure 1). Each of these participants were contacted through the mobile phone for their willingness to participate in the study. With those who were available and agreed to participate in the study, a time for personal interview was sought and was conducted at the pre fixed time and place after obtaining an informed consent.
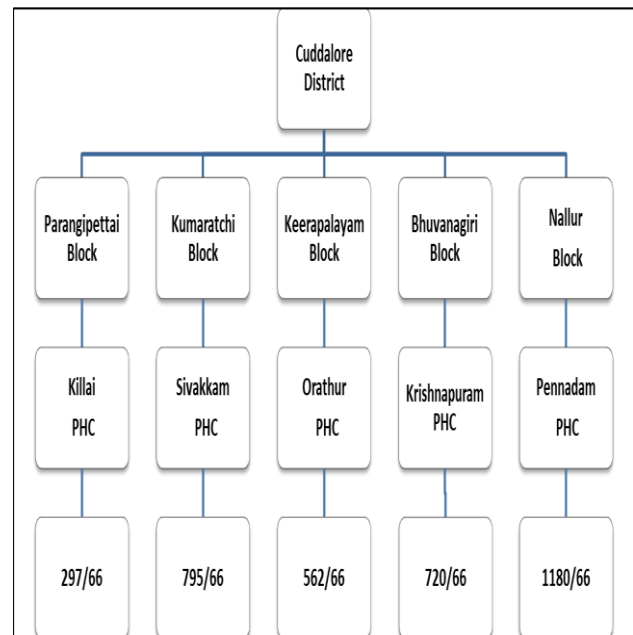

Figure 1: The sampling procedure.

Data collection tool

A predesigned, pretested semi structured interview schedule containing demographic characteristics like age, sex, marital status, educational status, occupational status, types of family, socio-economic status, and presence of comorbid illnesses was used. The COVID-19 infection–related factors like types of admission, course of treatment received and post recovery covid complications were also collected using the questionnaire. Symptoms of GAD were measured by using a standardised GAD-7 questionnaire containing 7 items, measured on 4-point Likert scale. A score of 8 and above were considered for clinically significant symptoms of anxiety.

Inclusion criteria

Individuals aged between 18 to 65, a resident in Cuddalore district, who were tested positive for COVID-19, and were either hospitalized or admitted in covid care center or home isolated and recovered from the disease, between one month to one year post covid infection at time of study.

Exclusion criteria

Individuals who bedridden, mentally challenged were excluded from this study.

Ethical consideration

This study was presented to the human ethical committee of Rajah Muthiah medical college, Annamalai university, and ethical approval was obtained prior to the study.

Data analysis

The collected data were entered in excel format and the database was established using SPSS (Statistical Package for the Social Sciences) statistical software for analysis. Categorical variables were expressed as frequencies and percentages. Chi-square and binominal logistic regression was used for statistical analysis. Differences were considered as the statistically significant if p value of <0 .05.

RESULTS

A total of 330 subjects were studied of whom, mean age was 35.5 years, and 216 (65%) of them were male. Majority of them 260 (78.8%) were married and a quarter of them were illiterate 47 (25.2%). Majority of the participants 115 (34.8%) were skilled workers and 64 (19.4%) were professionals, and 49 (14.8%) were health care workers. They were predominantly from the rural area, 238 (72.1%) and from nuclear families, 183 (55.5%). Majority of them belonged to middle class families, 114 (35%) (Table 1).

Most of study participants had undergone care at covid care centre 187 (56.7%) and 114 (34.5%) of them had received admission and care in the hospital. The number of days of treatment received varied for these participants with minimum of five days for 178 (53.6%) of them and up to 10 days for 98 (30%) participants and rest of them 54 (16.4%) received for more than 11 days. Most of this study participants 253 (76.7%) had mild to moderate illness requiring oral drugs alone and 51 (15.5%) of them were considered to have moderate to severe illness requiring injectable medications along with oral medications. Those who received oxygen support 26 (6.9%) had severe to life threatening illness. Around half of the participants 160 (48.5%) had their family members also been affected and among the affected family members 27 (8.2%) had died due to COVID-19. About 45 (13.6%) lost their job as well as the income due to COVID-19 infection. And about 20 (6.1%) had faced avoidance from their relatives and neighbours as shown in the Table 2.

As post COVID-19 infections, participants had various symptoms. Majority of the study participants had complaints of fatigue and myalgia,178 (53.9%) and a quarter of them had developed breathing problems (24.5%), where as 3.6% had cough, 1.8% had hair fall,1.5% had experienced of chest pain, and 0.6% of them had headache, while 0.9% of them had loss of appetite and loss of weight (Table 3).

Prevalence of generalised anxiety disorder in our study was 15.8% with 52 of the participants scoring more than 8 in the generalized anxiety disorder 7 score. A majority 231 (70%) of them had none to minimal anxiety (generalized anxiety disorder 7 score 0-4), and 47 (14.2%) of them had minimal to mild anxiety (generalized anxiety

disorder 7 score 5-7), and 7.3% of them had mild anxiety (generalized anxiety disorder 7 score 8-9) and 6.1% of them had moderate anxiety (generalized anxiety disorder 7 score 10-14). A few, 2.4% of them had the severe anxiety level with generalized anxiety disorder 7 score 15-21 as shown in the Table 4.

We found a significant association between the level of anxiety and increasing age (p=0.006), female gender (p=0.02), marital status (p=0.02) being widow/widower with a higher level of anxiety. Compare to unmarried participants, level of anxiety was higher for married persons. Participants belonging to lower socio-economic status had a significantly higher level of anxiety as compared to those in the upper and middle socio-economic conditions (p=0.01). Participants with co-morbidities had significantly higher level of anxiety (p<0.001) as compared to those who had no co-morbidities (Table 5).

Our study has shown significant association between anxiety and COVID-19 related factors such as place of admission (p<0.001), where those admitted at hospital were more at risk of developing anxiety as compared to those at covid care centre and on home quarantine. Number of days of hospital stay (p<0.001), type of treatment received (p<0.001), (those received oxygen support had more anxiety as compared to other treatments). Those participants whose family members contracted COVID-19 infection had a significant association (p=0.003) and whose family members had died due to COVID-19 infection (p=0.003) with anxiety. A statistically significant association was noted with a higher level of anxiety and participants who had complications (p<0.001) or persons experienced avoidance by relatives as well as neighbours (p<0.01) (Table 6).

The step wise binary logistic regression analysis for gender, COVID infection contracted family members Avoidance by the relatives, duration of hospital stays and place of being admitted during covid infection has been identified as the most significant variable. The results indicated that, being a female was 2.5 times at higher risk of developing anxiety as compared to male. Those with family members contracted COVID-19 infection, were 2.1 times at higher risk of developing anxiety as compared to those, whose family members were not contracted the disease. Being Avoided by the relatives and neighbours were 4.1 times at higher risk of developing anxiety. Those participants who had a longer duration of institutional stay for COVID-19 infection were 5.8 times at higher risk of developing anxiety. Based on the place of admission, those in covid care centre were 9.7 times at higher risk of developing anxiety as compared to home quarantine and those who were admitted in the hospital were at 56.9 times of higher risk of developing anxiety as compared to home quarantine (Table 7).

Table 1: Demographic characteristics of the study participants, (n=330).

Characteristics	Frequency	Percentage (%)
Age (years)		
Below 26	58	17.6
26-35	125	37.9
36-45	91	27.6
46-55	41	12.4
Above 55	15	4.5
Gender		
Female	114	34.5
male	216	65.5
Marital status		
Married	260	78.8
Unmarried	62	18.8
Widow/widower	8	2.4
Educational level		
Illiterate	47	25.2
Primary	74	22.4
Higher secondary	56	17
Diploma	83	25.2
P.G/ professional	70	21.2
Occupation		
Unemployed	69	20.9
Student	38	11.5
Unskilled worker	44	13.3
Skilled worker	115	34.8
Professional	64	19.4
Residence		
Rural	238	72.1
Urban	92	27.9
Health care workers		
Yes	49	14.8
No	281	85.2
Type of family		
Nuclear	183	55.5
Joint	144	43.6
Staying alone	3	0.9
Socio-economic status		
Upper class	56	17
Upper middle class	106	32.1
Middle class	114	35.5
Lower middle class	42	12.7
Lower class	9	2.7
Co-morbidities		
Present	72	21.8
absent	258	78.2

Table 2: COVID-19 infection management details of the study participants.

Characteristics	Frequency	Percentage (%)
Treatment care level		
Covid care centre	187	56.7
Hospital admission	110	33.3
More than one hospital	4	1.2
Home quarantine	29	8.8

Continued.

Characteristics	Frequency	Percentage (%)
No. days of treatment (days)		
≤ 5	178	53.6
6-10	98	30
≥11	54	16.4
Types of treatment received		
Oral drugs alone/ mild-moderate covid patient	253	76.7
oral drugs and Injectable/ moderate-severe COVID patients	51	15.5
Oxygen supports, injectable, oral drugs/ severe to life threating COVID-19 patients	26	7.9
Family members contracted COVID-19		
Yes	160	48.5
No	170	51.5
Affected family members died due to COVID-19		
Yes	27	16.9
No	133	83.1
Avoidance by relatives and neighbours	20	6.1
Loss of job /income	45	13.6

Table 3: Distribution of study participants according to post COVID-19 symptoms.

Post COVID complications	Total	Percentage (%)
Fatigue and myalgia	178	53.9
Breathing problems	81	24.5
cough	12	3.6
Hair fall	6	1.8
chest pain	5	1.5
Head ache	3	0.9
Loss of appetite/ weight changes	3	0.9

Table 4: Level of symptoms of anxiety of the participants.

GAD 7 score	Level of anxiety	Frequency	Percentage (%)	Anxiety of clinical concern, n (%)	
0-4	None to minimal	231	70	Non-significant	278 (84.2)
5-7	Minimal to Mild	47	14.2		
8-9	Mild anxiety	24	7.3	significant	52 (15.8)
10-14	Moderate anxiety	20	6.1		
15-21	Severe anxiety	8	2.4		
	Total	330	100		330

Table 5: Association between anxiety and socio-demographic characteristics of the participants.

Variables		Anxiety present		Anxiety absent		Chi-square value	Df	P value
		N	%	N	%			
Age (years)	Below 26	3	5.2	55	94.8	14.594	4	0.006*
	26-35	16	12.8	109	87.2			
	36-45	19	20.9	72	79.1			
	46-55	8	19.5	33	80.5			
	Above 55	6	40	9	60			
Sex	Female	25	21.9	89	78.1	4.998	1	0.02*
	Male	27	12.5	189	87.5			
Marital status	Married	45	17.3	215	82.7	7.364	2	0.02*
	Unmarried	4	6.5	58	93.5			
	Widow/widower	3	37.5	5	62.5			
Residence	Rural	35	14.7	203	85.3	0.711	1	0.399
	Urban	17	18.5	75	81.5			

Continued.

Variables		Anxiety present		Anxiety absent		Chi-square value	Df	P value
		N	%	N	%			
Education	Illiterate	7	14.9	40	85.1	0.220	2	0.896
	Up to higher secondary	22	16.9	108	83.1			
	Degrees/ diplomas	23	15	130	85			
Occupation	Unskilled	22	14.6	129	85.4	0.296	1	0.586
	Skilled	30	16.8	149	83.2			
Health care worker	Yes	10	20.4	39	79.6	0.938	1	0.333
	no	42	14.9	239	85.1			
Religion	Hindu	46	14.8	265	85.2	5.097	2	0.078
	Muslim	4	26.7	11	73.3			
	Christian	2	50	2	50			
Family type	Nuclear	29	15.8	154	84.2	0.002	1	0.960
	Joint	23	15.6	124	84.4			
Socio-economic status	Upper	13	23.2	43	76.8	9.223	2	0.01*
	Middle	35	13.2	230	86.8			
	Lower	4	44.4	5	55.6			
Co-morbidities	Present	23	31.9	49	68.1	18.177	1	<0.001*
	Absent	29	11.2	229	88.8			

Table 6: Association between anxiety and COVID-19 related variables.

Variables		Anxiety present		Anxiety absent		Chi-square value	Df	P value
		N	%	N	%			
Place of admission	Hospital	40	35.1	74	64.9	49.137	2	<0.001*
	COVID care centre	11	5.9	176	94.1			
	Home quarantine	1	3.4	28	96.6			
Number of hospital stay	≤5	13	7.3	165	92.7	21.803	2	<0.001*
	6-10	23	23.5	75	76.5			
	≥11	16	29.6	38	70.4			
Type of treatment received	Oral drugs	19	7.5	234	92.5	70.571	2	<0.001*
	With injectable drugs	16	31.4	35	68.6			
	With oxygen supports	17	65.4	9	34.6			
Family members affected by COVID-19	Yes	35	21.9	125	78.1	8.756	1	0.003*
	No	17	10	153	90			
Affected family members died due to COVID	Yes	10	37	17	63	10.031	1	0.002*
	No	42	13.9	261	86.1			
Complication due to COVID	Present	42	23.6	136	76.4	17.884	1	<0.001*
	Absent	10	6.6	142	93.4			
Functional impairment	Present	1	20.0	4	80.0	0.069	1	0.793
	Absent	51	15.7	274	84.3			
Avoided by relatives/ neighbour	Yes	7	35	13	65	5.939	1	0.01*
	No	45	14.5	265	85.5			
Lost of job/ incomes	Yes	11	24.4	34	75.6	2.962	1	0.08
	no	41	14.4	244	85.6			

*Statistically significant p<0.05.

Table 7: Logistic regression analysis with anxiety as dependent variables and selected independent variables.

Independent variables		Regression co-efficient value (B)	P value	Adjusted odds ratio, AOR (95% CI)	95% CI Of AOC	
					Lower	Upper
Gender	Male	-		1		
	Female	0.933	0.01*	2.543	1.246	5.186
Contracted family members	No	-		1		
	Yes	0.744	0.04*	2.105	1.026	4.315
Avoidance by the relatives	No	-		1		
	Yes	1.419	0.02*	4.134	1.239	13.789
No. of days hospital stays	≤5	-		1		
	6 to 10	0.430	0.330	1.537	0.648	3.646
	≥11	1.774	0.001*	5.896	1.976	17.591
Place of admitted	Home quarantine	-		1		
	COVID care centre	2.276	0.05*	9.740	0.973	97.491
	Hospital	4.043	<0.001*	56.995	6.363	510.518

*Statistically significant p<0.05.

DISCUSSION

Our study aimed at estimating the prevalence of GAD among covid-19 survivors, and is found to be 15.8%. This is similar to some other studies, where they have found prevalence varying from 8% to 39. 6%.[8-11] According to DSM-5, estimated lifetime prevalence of GAD, worldwide was 3.7% pre-pandemic and in India 0.5%.[1,12] However, studies done during this pandemic has shown much higher prevalence of GAD, 22.5% particularly among COVID-19 survivors.[13] And according to Chen et al 22.6% experienced moderate to severe GAD during the early rapid outbreak in China.[14] In a systematic review done by Da silva et that 52.6% of the general population had a higher prevalence of anxiety symptoms, followed by medical health workers corresponding to 49.9% and infected patients 8.0%.[15]

We assessed various factors such as demographic factors, the stigma related to COVID-19, type of admission, number of hospital stays, treatment received during the infective period, and any pre-existing chronic medical illnesses for its association with GAD. We found in our study female gender had the higher risk of developing anxiety as compared to male (p=0.02). According to DSM-5, GAD affects the female (55-60%) more than male and this finding is consistent with other studies as well.[12,16-19] The gender dissimilarities might be due to the higher genetic sensitivity of women toward disturbing situations, their hormonal imbalances.[11] Females are more easily socialized and are more open and are even strongly expresses their emotions.[20] Female are the main caregiver in the family, being responsible for the household tasks and care of the children, which makes them vulnerable for the anxiety.[21] Our study found that anxiety was highest in individuals who were divorced or widowed, Similar findings have been observed in other studies.[22,23] An increased level of anxiety in married participants were noted as compared to the unmarried counterparts and which is a similar findings in other studies.[15-19] This could be due to an increased sense of responsibility felt by the married persons for their family's health, and economic stability.

Our study further explored individuals with pre-existing chronic diseases such as diabetes mellitus and hypertension and has shown an increased anxiety and this findings consistent with many other studies.[22,24-27] This study has observed that participants, whose family members were affected by COVID-19 infection, were at higher risk of developing anxiety and this finding was consistent with other study done by Chen et al.[14] Those who had been avoided by the relatives and neighbours developed more anxiety, possibly due to an intensified fear of the virus and worry about close relatives and friends being infected.[28] Our study further observed that as the number of days being admitted increases, they were at higher risk of developing anxiety. As the severity of disease increases the anxiety also increases, which can be possible due to impending risk of death and fear of hospitalization.[29]

CONCLUSION

COVID-19 pandemic has affected individuals both physically and psychologically. The result of our study among adult COVID-19 survivors has shown a higher prevalence of generalized anxiety symptoms. Higher anxiety symptoms were associated with certain socio-demographic factors like female gender, lack of social and emotion support (widow/widower), worry about discrimination or avoidance experienced from family members, fear of infecting family members and others and the possible loss of income to the family. Therefore, it is important to have a psychosocial recovery of the patients after COVID-19 infection.

Our study being cross-sectional in nature it does not establish the cause-effect relationship. Although prospective studies that could provide potential insight into causation, it may be difficult to conduct such studies during the pandemic. This study was conducted in a small population in south India, and so may not be able to generalise to other populations in India. Although GAD 7 scale is a widely accepted tool for screening GAD, clinical diagnosis needs to be established. According to DSM-5 for clinical diagnosis of GAD, need continued observation over a period of 6 months. Therefore, creating awareness at all levels of health management, particularly at the grass root level, is required to prevent, and to have a timely diagnosis of the generalise anxiety disorder. It is also important and appropriate to manage and treat GAD by implementing appropriate interventions and programs such as periodic screening among the vulnerable population.

ACKNOWLEDGMENTS

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