A cross-sectional online survey on COVID-19 related anxiety among students of Tertiary care center

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Abstract

Background: COVID19 pandemic has deleterious effect on mental health of people around world. Like medical professionals, students of tertiary care center are also at higher risk of developing anxiety related to COVID19.

Objectives: To assess severity of COVID19 related anxiety and identify underlying risk factors among students of different courses of tertiary care center.

Materials and Methods: A cross-sectional online survey was conducted including 704 students aged above 18 years from different courses of tertiary care center. Study was conducted after obtaining clearance from Institutional Ethical Committee and informed consent was obtained online. Anxiety related to COVID19 was assessed using COVI19 Anxiety Syndrome Scale (COVID19ASS). Statistical analysis for descriptive data was done by using mean and percentage.

Results: Study comprised of 50.4% female and 49.6% male students with mean age of 20+4 and 21+3 years respectively. Mean COVID19ASS scores of male and female students was found to be 18.6 (SD=4.3) and 19.7 (SD=3.8) with no statistically significant difference (p value=0.41, x^2= 2.87, df- 3). In factor analysis, age group 18-20 years, students in first year MBBS, first and second year of paramedical/nursing course, postgraduates, history of COVID19 infection in the past, history of either infection or death due to COVID19 in family or friend were significant risk factors for perseveration and avoidance behavior.

Conclusion: Students who report of pandemic associated anxiety should be thoroughly interviewed for severity of symptoms. This may help in early identification of mal-adaptive behavior, so that early intervention either pharmacological or psychological therapy can be initiated.

Key words: COVID19, Pandemic, COVID19 Anxiety, COVID19ASS, Online survey

Introduction

COVID19 pandemic is affecting the population around the world since 2019. It is caused by novel corona virus SARS CoV2,[1] and was declared concern for public health by World Health Organisation (WHO) on March 11, 2020.[2] As of March 2022, global confirmed cases were more than 440 million including 59 million deaths and in India more than 42 million cases have been confirmed positive with half a million deaths.[3] There are many studies that have highlighted the impact of pandemic on mental health of people around the world.[4] Along with physical illness, it has led to development of psychological problems like anxiety, depression and post traumatic stress disorder. According to a meta-analysis, the overall pooled prevalence of depression, anxiety, and distress was found be 31.4%, 31.9%, and 41.1% respectively.[5] Also, a retrospective study done in USA found that survivors of COVI19 had more psychiatric sequelae.[6] Many countries around the world imposed complete lock downs to contain

the spread of virus which led to economic disruption, loss of jobs and social disruption paving way for the development of psychological distress.[7,8] Over time these restrictions were removed as prevalence of COVID19 decreased and also due to introduction of COVID19 vaccines and severity of symptoms. However, many people around the world are having difficulties in getting back to the normal living. As per the report by Kingston University London, one in six people are having difficulties getting back routine pre-pandemic life, like going to public places, using public transport and going to workplace.[9] There have been reports that, this pandemic has lead to emergence of new entity "COVID19 Anxiety Syndrome" characeised by mal-adaptive coping behaviors like repeated checking for the symptoms of COVID19, avoidance of public places and repeated cleaning.[10] Many studies have been conducted to assess the stress, exacerbation of preexisting anxiety or new onset of anxiety disorders and depression during pandemic both in general population and medical professionals.[11,12] Studies have also been done involving doctors who are directly and indirectly involved in the treatment of COVID19 patients and have shown that, there is significant increase in the levels of anxiety.[13] Factors responsible for increased anxiety may be fear of infection or uncertainty over outcome.[13] Like medical professionals, students of medical institute are also at higher risk of developing anxiety regarding COVID19 even though virtual classes have been taken, due to nature of profession they are invariably to attend labs and wards.[14] However, not many studies have been conducted in Indian sub-continent till date to assess the COVID19 anxiety even though many tools have been developed to assess the same.

Objectives
1. To assess the severity of COVID19 related anxiety among students of different courses of tertiary care center.
2. To identify the risk factors for development of anxiety related to COVID19.

Materials and Methods

This cross-sectional online survey was conducted in tertiary care center, southern India including 704 students from different courses like MBBS (undergraduates), para-medical, nursing and post-graduation using google platform. Study was conducted for duration of three months from October 2021 to December 2021. Online data collection was started after obtaining Institutional Ethical Committee clearance and informed consent from all the participants was taken online after giving brief description regarding the nature of the study.

Inclusion criteria:
1. Students from various courses like MBBS (Undergraduate), Para-medical, Nursing and Post-graduation.
2. Students of all genders aged at least 18 years and above.

Procedure

This cross-sectional online survey was conducted in medical college, Karnataka, India. A total of 704 students from different courses were included. A google form was created to collect data and was divided into two parts. First part comprised questionnaire regarding the socio-demographic details and second part contained Covid 19 Anxiety Syndrome Scale questionnaire. Consent from all participants was obtained electronically. To ensure adequate participation and response from the participants, college registries were used to collect student's details after obtaining required permissions from college authorities. Google form was sent personally to all participants through social media applications like Whats-app, Instagram, E-mail and others.

Tools used for the study:
COVID19 Anxiety Syndrome Scale (COVID19ASS):

Particular scale is developed by Ana V and Marcantonia M Spada et al.[15] It assesses anxiety in response to COVID19 pandemic and associated mal-adaptive coping behaviors like avoiding public places or transport, repeatedly checking for COVID19 symptoms, preoccupation with excessive worries regarding the health related consequences if contracted with COVID19 infection and threat monitoring. Scale has nine items, which are divided into Factor1 and Factor2. Factor1 assesses mal-adaptive perseveration behaviors like checking oneself for symptoms of COVID19, concerns regarding not adhering to the social distancing rules, spending more time on reading about the COVID19 news at the cost of other works, checking family members for signs of COVID19, paying close attention to the people displaying possible symptoms of COVID19 and excessive worries regarding the consequences if contracted with illness. Whereas Factor2 assesses avoidance behaviors like avoiding public transportation, avoiding going to public places and avoiding touching things in public places. Each item is scored on 0-4 severity likert scale in which score 0 indicates no anxiety at all, score 1 indicates anxiety present rarely, score 2 indicates anxiety present for several days, score 3 indicates anxiety more than 7 days and score 4 indicates anxiety which is present nearly every day. This scale assesses anxiety in response to COVID19 pandemic over the past two weeks and total score ranges from 0 to 36. Higher scores indicate higher levels of anxiety. Particular scale has fair reliability and good validity in assessing anxiety in response to pandemic (Cronbach's alpha = 0.86).[15] In this study, total scores

were divided into four groups that is 0-9, 10-18, 19-27 and 28-36 indicating different levels of severity and were compared with different socio-demographic variables.

Statistical analysis for descriptive data was done by using mean and percentage. Association between different variables for significance was done by chi-square test using SPSS Version 24 (IBM, Chicago, IL, USA). For statistical significance, p value of less than 0.05 was considered.

Results

This online survey comprised of 704 students from different courses of Gadag Institute of Medical Sciences, Gadag. Among the total sample, 340 (48.3%) students were in the age group of 18 to 20 years followed by 28.9% in 21-23 years. 355 (50.45%) of study sample were females and 349 (49.6%) were males with mean age of 20+4 years and 21+3 years respectively. Mean COVID19ASS scores of male and female students was found to be 22.6 (SD= 4.3) and 20.4 (SD=3.8) respectively with no statistically significant difference in anxiety levels. Among the different courses, 219 (31%) students were from MBBS and 163 (25.5%) were from Paramedical and remaining students belonged to Nursing and other courses. Among the socio-demographic variables, students in age group 18-20 years, students from MBBS course who were in first year MBBS, paramedical students of first and second year and post graduates of clinical departments had higher levels of anxiety which was statistically significant. However, there was no significant difference among male and female students with p value of 0.41 (x^2= 2.87, df- 3). Table 1

Among the clinical variables, 118 students had history of infection and 33 students lost one of their family members due to infection. Students with history of COVID19 infection, with history of COVID19 infection in family, with history of death of family member due to COVID19 infection had significantly higher levels of anxiety compared to other students which was statistically significant. Vaccination status was also assessed in this study and found that most of the students 584 (84%) were fully vaccinated and only 29 (4.1%) students were not vaccinated at all. Students who were not vaccinated even with single dose had higher levels of anxiety compared to students who were either fully vaccinated or vaccinated with at least single dose and it was statistically significant (p value- 0.00, x^2-57.7, df-9). Table 2

When Factor1 analysis was conducted, 18-20 age group, students from MBBS course studying in first year, students in third year of paramedical/nursing course, history of COVID19 infection and death due to infection in family and close friends and non vaccination status were significant risk factors for indulging in mal-adaptive perseveration behaviors. Table 3

Other finding of the study was, in Factor2 analysis, MBBS students studying in first year, history of COVID19 infection in self, family members and close friends and students who were doing post-graduation were significant risk factors for indulging in avoidance behaviors like avoiding public places and transportation. Table 4

Table 1: Data regarding socio-demographic profile

		Total score				Total	Pearson's chi-square	P value
		0-9	10-18	19-27	28-36			
Age	18-20	66	191	67	16	340	x^2 - 34.23 df-9	.000
	21-23	18	114	51	21	204		
	24-26	10	64	41	13	128		
	27-29	2	14	13	3	32		
	Total	96	383	172	53	704		
Gender	Male	43	200	83	23	349	x^2 - 2.879 df -3	.41
	Female	53	183	89	30	355		
	Total	96	383	172	53	704		
Education	MBBS	21	91	78	29	219	x^2 - 157.6 df -15	.000
	Nursing	8	131	22	2	163		
	Paramedical	51	107	19	3	180		
	House surgeon	14	46	39	15	114		
	Post Graduate	2	8	14	4	28		
		96	383	172	53	704		
Year of Nursing/ Paramedical	First	29	45	12	2	88	$x^2$144.14 df – 12	.000
	Second	19	90	11	3	123		
	Third	12	102	17	1	132		
Year of MBBS	First	8	42	27	9	86	$x^2$55.40 df -15	.000
	Second	3	15	17	6	41		
	Third	8	16	20	7	51		
	Fourth	1	18	15	7	41		

							Pearson's chi-square	P value
Year of post-graduation	First	2	6	13	4	25	x^2 - 18.957 df – 12	.090
	Second	0	1	1	0	2		
	Third	0	1	0	0	1		
Department of post-graduation	Clinical	2	5	14	3	24	x^2 - 26.944 df – 12	.008
	Pre-clinical	0	2	0	0	2		
	Para-clinical	0	1	0	1	2		

Table 2: Data regarding clinical variables

		Total score				Total	Pearson's chi-square	P value
0-9		**10-18**	**19-27**	**28-36**				
History of COVID-19 infection	Yes	8	47	49	14	118	x^2 - 30.91 df - 3	.000
	No	88	336	123	39	586		
	Total	96	383	172	53	704		
History of COVID-19 infection in family	Yes	15	47	63	25	150	x^{2-} 65.7 df - 3	.000
	No	81	336	109	28	554		
	Total	96	383	172	53	704		
History of death in family due to COVID19	Yes	4	11	13	5	33	$x2$ - 15.74 df - 6	.015
	No	92	372	159	48	671		
	Total	96	383	172	53	704		
History of COVID19 infection in close friends	Yes	29	69	91	32	221	x^2 - 96.240 df - 6	.000
	No	67	314	81	21	483		
	Total	96	383	172	53	704		
History of death close friends due to COVID19	Yes	4	10	8	2	24	x^2 - 7.95 df - 6	.242
	No	92	373	164	51	680		
	Total	96	383	172	53	704		
Vaccination status	Single dose	19	48	20	4	91		
	Completed	62	327	146	49	584		
	Not vaccinated	15	8	6	0	29		
	Total	96	383	172	53	704		

Table 3: Data regarding Factor1 (Perseveration) analysis

		Factor analysis			Total	Pearson's chi-square	P value
		0-9	**10-18**	**19-27**	**Total**		
Age	18-20	119	201	20	340	x^2 - 33.158 df - 6	.000
	21-23	36	139	29	204		
	24-26	28	88	12	128		
	27-29	3	25	4	32		
	Total	186	453	65	704		
Gender	Male	85	236	28	349	x^{2-} 3.369 df - 2	.186
	Female	101	217	37	355		
	Total	186	453	65	704		
Education	MBBS	62	122	35	219	x^2 - 85.235 df -10	.000
	Nursing	20	140	3	163		
	Paramedical	74	101	5	180		
	House surgeon	25	70	19	114		
	Post Graduate	5	20	3	28		
Year of Nursing/ Paramedical	First	41	45	2	88	x^2 - 66.112 df - 8	.000
	Second	32	88	3	123		
	Third	22	107	3	132		

Year of MBBS	First	27	48	11	86	x^2 - 28.823 df -10	.001
	Second	14	19	8	41		
	Third	13	28	10	51		
	Fourth	7	27	7	41		
Year of post-graduation	First	4	18	3	25	x^2 - 3.384 df - 8	.908
	Second	1	1	0	2		
	Third	0	1	0	1		
History of COVID-19 infection	Yes	23	79	16	118	x^2 - 5.599 df - 2	.06
	No	163	374	49	586		
	Total	186	453	65	704		
History of COVID-19 infection in family	Yes	36	85	29	150	x^2 - 23.23 df - 2	.000
	No	150	368	36	554		
	Total	186	453	65	704		
History of death in family due to COVID19	Yes	11	14	8	33	x^2 - 14.340 df - 4	.006
	No	175	439	57	671		
	Total	186	453	65	704		
History of COVID19 infection in close friends	Yes	58	126	37	221	x^2 - 25.249 df - 4	.000
	No	128	327	28	483		
	Total	186	453	65	704		
History of death close friends due to COVID19	Yes	9	12	3	24	x^2 - 4.361 df - 4	.359
	No	177	441	62	680		
	Total	186	453	65	704		
Vaccination status	Single dose	33	54	4	91	x^2 - 42.257 df - 6	.000
	Completed	133	390	61	584		
	Not vaccinated	20	9	0	29		
		186	453	65	704		

Table 4: Data regarding Factor2 (Avoidance) analysis.

		Factor 2 analysis		Total	Pearson's chi-square	P value
		0-9	10-18			
Age	1	319	21	340	x^2 - 7.372 df - 3	.061
	2	182	22	204		
	3	111	17	128		
	4	28	4	32		
	Total	640	64	704		
Gender	Male	320	29	349	x^2.511 df -1	.475
	Female	320	35	355		
	Total	640	64	704		
Education	MBBS	187	32	219	x^2 - 47.042 df - 5	.000
	Nursing	161	2	163		
	Paramedical	174	6	180		
	House surgeon	98	16	114		
	Post Graduate	20	8	28		
		640	64	704		
Year of Nursing/ Paramedical	First	82	6	88	x^2 - 37.908 df – 4	.000
	Second	120	3	123		
	Third	132	0	132		
Year of MBBS	First	75	11	86	x^2 - 12.744 df – 5	.026
	Second	35	6	41		
	Third	42	9	51		
	Fourth	35	6	41		

Year of post-graduation	First Second Third	17 2 1	8 0 0	25 2 1	x^2- 16.875 df – 4	.002
History of COVID-19 infection	Yes No	103 537	15 49	118 586	x^2 - 2.249 df- 1	.0134
History of COVID-19 infection in family	Yes No	125 515	25 39	150 554	x^2 - 13.237 df- 1	.000
History of death in family due to COVID19	Yes No	27 613	6 58	33 671	x^2 - 3.875 df- 2	.144
History of COVID19 infection in close friends	Yes No	184 456	37 27	221 483	x^2- 23.158 df- 2	.000
History of death close friends due to COVID19	Yes No	21 619	3 61	24 680	x^2- .547 df-2	.761
Vaccination status	Single dose Completed Not vaccinated	88 525 27	3 59 2	91 584 29	X^2 - 4.616 df- 3	.202

Discussion

To our knowledge this is the first study done to evaluate the anxiety in response to COVID19 pandemic among the students of Tertiary care center. Extensive research has been done to assess the impact of COVID19 pandemic on mental health that have showed significant increase in anxiety levels, depressive symptoms and sleep disturbances.[16] However; not many studies have been done in Indian subcontinent to assess the anxiety in response to COVID19 even though literature regarding the same is emerging. Recently, after lock downs and restrictions have been eased, there are reports of people showing mal-adaptive behavior. This study comprised of students from different courses and found that Mean COVID19ASS scores of male and female students to be 22.6 (SD= 4.3) and 20.4 (SD=3.8) respectively with no statistically significant difference in severity of anxiety levels. Particular finding of the study is accordance with the study by Sherman et al. However, tool used to measure the anxiety in this study was, Corona-virus anxiety scale (CAS) having similar psychometric properties.[17] However, a study by Chowdhury et al reported that, female students had significantly higher levels of anxiety related to COVID19 compared to male counterparts.[18] Also, studies have been done to assess the long term effects of pandemic over mental health, which reported increased levels of anxiety (due to fear of contracting COVID19).[19] Study also found that, among socio-demographic variables, students in the age group of 18-20 years studying first year of MBBS and first and second year of paramedical/nursing

course had significantly higher levels of COVID19 related anxiety. This finding can be explained fact that, students who had just begun the medical profession lack adequate knowledge regarding the nature and severity of illness, mode of spread and outcome of illness. This will lead to increased anxiety levels and mal-adaptive behavior in the form of threat monitoring and repeated checking oneself for symptoms COVID19. This is also explained by recently postulated behavioral response model, that states perceived stress and fear of anxiety leads to development of COVID19 anxiety syndrome.[20] Other finding of the study is, postgraduates had significantly higher anxiety levels compared to other courses. Possible explanations may be that, postgraduates are frontline workers directly involved in the treatment and management of COVID19 patients increasing the anxiety levels. Study by Imran et al reported that, among 10,178 postgraduate trainees, 26.4% had anxiety disorders and most of the students had underlying fear of contracting illness. However, tool used in this study is Generalised anxiety disorder scale having similar psychometric properties.[21]

Among the clinical variables, students who were positive for COVID19 in the past and who had history of either illness or death due to COVID19 in the family members and friends had significantly higher levels of anxiety. This finding is in accordance with study done in China assessing long term impact of pandemic and reported severe anxiety in students whose family members were infected with COVID19.[22] Study also found that, full vaccination status in students was protective factor against the development of COVID19 related anxiety

which might be due to sense relief against contracting infection. No studies have been conducted to assess the impact of vaccination on mental health in medical students. However, a study done involving 320 dentists reported that vaccination status significantly reduced corona associated anxiety.[23]

Other significant finding of this study was in factor analysis for both factor1 and factor2 assessing perseveration and avoidance behavior students studying in first year of MBBS, first and second year of nursing/paramedical course, history of infection and death in family members due to COVID19 were significantly associated with threat monitoring and avoidance behavior in students. This finding might be due to unpredictable outcome of illness, lack of knowledge about illness and emerging new variants of virus leading to perseveration and avoidance behavior. A study done in Pakistan involving 400 participants found that 88.8% feared going to marketplaces, 94.5% were concerned for the health of their family members, and 71% felt under-confident with the current infection control measures.[24]

Major strength of current study is that, it assesses the emerging impact of COVID19 on mental health in students of tertiary care center which might restrict them in getting back to normal societal life like going to work or involving public events. This in turn will affect their overall educational performance and adds to economic burden on family. Other strength being use of COVID19ASS with good reliability and concurrent validity making results more acceptable. Also study involves adequate sample size of 704 from different courses making results more reliable.

However, this study is not devoid of limitations like, past history of psychiatry illness of students was not taken into consideration which may have significant effect on total anxiety scores. Also anxious personality, pre-morbid levels functioning and pre-morbid mal-adaptive behavior in the form of substance use disorder in response to anxiety were not assessed which may act as vulnerability factor for exacerbation of COVID associated anxiety in these students.

Conclusion

COVID19 pandemic has deleterious effect on mental health of population around the world including students. It has lead to emergence of new entity, COVID19 anxiety syndrome in the form of mal-adaptive perseveration and avoidance behavior. Students who report of pandemic associated anxiety should be thoroughly interviewed for severity of symptoms. This may help in early identification of mal-adaptive behavior, so that early intervention either pharmacological or psychological therapy can be initiated. This will help in overall performance of students and also

efforts should be made to create awareness among the students regarding the infection to reduce the apprehension associated with it.

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