IMPACT OF COVID-19 PANDEMIC ON MENTAL HEALTH AND PREVALENCE OF POST COVID CONDITIONS

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ABSTRACT

Background: The study aims to analyze the post-COVID syndrome among late middle-aged adults and to assess the extent of changes in mental health problems in late middle-aged adults during the COVID-19 pandemic.

Methods: A cross-sectional study was conducted among 186 middle-aged COVID-19 patients, admitted at a tertiary care hospital which was approved by the IEC. Medical and medication history, and comorbidities collected from case sheets, and patients' sociodemographic data was collected through questionnaires and telephone interviews were conducted to collect and classify post-syndrome symptoms. A self-validated scale concerning DASS 21 was used to assess the mental health of patients.

Results: Among the 186 study subjects, 58(28%) mild and 37(20%)moderate to severe depression, 73(39%) mild and 60(32%)moderate to severe anxiety & 64(34%)mild and 89(48%) moderate to severe stress. As for post covid symptoms, 61(32.79%) had fatigue, 52(27.95%) had dyspnoea, 43(23.12%) had joint pain/muscle pain, 38(20.43%) had GI problems, 35(18.82%) had alopecia, 32(17.2%) had insomnia, 16(8.6%) had dizziness, 15(8.06%) had loss of appetite,11(5.91%) had cough and 15 (8.06%) had other symptoms.

Conclusion: Based on our findings, we concluded stress was relevant during the COVID-19 pandemic and among them, anxiety was more prevalent than depression. In the case of post covid symptoms, pulmonological symptoms are more prevalent followed by orthopaedics, gastroenterological, dermatological & psychiatric symptoms.

Keywords: COVID-19, mental health, anxiety, stress, depression, DASS 21, post covid syndrome.

INTRODUCTION

COVID-19 is a highly infectious respiratory disease caused by the novel coronavirus SARS-CoV-2. The COVID-19 epidemic, which started in Wuhan, China in December 2019 has expanded to infect nearly 52 million people globally and caused 6 million fatalities in 216 nations, regions, or territories [1]. COVID-19 is largely transmitted by respiratory droplets since it is caused by the coronavirus. COVID-19 is more contagious and spreads faster than earlier epidemics like MERD and SARS. The severity of COVID-19 symptoms varies in each individual, with older adults and those with comorbid conditions such as Serious heart disease, cancer, COPD, and diabetes [2]. COVID-19 has a 5-6 day incubation period and infected individuals can be infectious during the pre-symptomatic phase, potentially spreading the virus to healthy persons.

In India, the first COVID-19 case was reported in Kerala and the country has experienced four lockdowns and two unlock periods. The range of mild to severe symptoms might include, fever, coughing, exhaustion, shortness of breath, body pains, and loss of smell or taste [3], [4]. Maintaining a safe distance from people, abstaining from touching the face, using hand sanitizer, using a mask, washing hands often, and covering the mouth when coughing or sneezing are all preventive strategies. COVID-19 lockdown affects the emotional and mental health of people. The lockdown has prevented the virus from spreading, but it also caused symptoms of anxiety, depression, and post-traumatic stress disorder [5]. The majority of depressed and anxious persons are females and young adults. Physical segregation, confinement, and isolation can worsen psychological trauma, withdrawal symptoms, mental health problems, and loneliness [6], [7]. Increased psychological distress, anxiety, depression, and drug abuse have all been linked to the lockdown, along with, decreased physical activity, altered sleep patterns, weight gain, and increased alcohol use [8]–[10]. According to published research, late-middle-aged individuals are more frequently affected by COVID-19 than children and young adults. Furthermore, earlier research revealed that late middle-aged people had a high frequency of anxiety and mood problems as well as a significant burden of mental disorders [11]–[13]. The study mainly focuses on mental health problems experienced by late middle-aged adults during the COVID-19 pandemic. The survivors tend to have an increased chance of developing a mental health issue.

The study also focuses on post-COVID symptoms observed by individuals following COVID-19 infection. Post-COVID syndrome refers to the signs and symptoms that develop during or after an infection consistent with COVID-19 [14]. Most people recover well within a few days to a few weeks after infection, but some experience health problems that last longer than four weeks following COVID-19 infection. Post-COVID symptoms may be detected at least four weeks after infection and are assumed to be a multisystem illness with somatic, functional, mental, and psychiatric manifestations [15], [16]. The syndrome is defined by the persistence of clinical symptoms four weeks after the start of acute symptoms. Symptoms can include fatigue, breathing issues or shortness of breath, chest discomfort, cough, a pounding or fast-beating heart, neurological manifestations, digestive symptoms, muscle or joint discomfort, rash, and menstrual changes [17]–[19]. Smell dysfunctions such as Anosmia and Hyposmia are self-limiting and nearly all of the patients recover after four weeks. Taste loss is another self-limiting condition that many people recover from in a matter of weeks [20]. Common symptoms in persons 65 and older may manifest differently, and some elderly persons may experience atypical symptoms or a prolonged onset of symptoms. Post-COVID symptoms can be relieved by adopting well-established symptom management methods such as rehabilitation regimens, and lifestyle modification in areas such as nutrition, sleep, and stress reduction [15]. After carefully considering the

advantages and dangers of pharmacological treatments, FDA-approved or over-the-counter drugs, as well as vitamin or electrolyte supplements, may be beneficial for specific disorders or established deficiencies.

MATERIALS AND METHODS:
Study Materials
The various study materials included are a self-designed data collection form, a self-designed validated questionnaire, an informed consent form, and patient case notes.
Study design and duration
This retrospective cross-sectional study was conducted for a duration of 6 months from January 2022 to June 2022.
Study population
From a total of 200 patients screened, 186 patients were included in this study as per inclusion and exclusion criteria.
Inclusion criteria
Patients aged between 45-65 years who are infected with Covid-19 were included in the study.
Exclusion criteria
People with pre-existing mental illness were excluded from the study.

Study Methodology
This retrospective cross-sectional study was conducted on COVID-19 patients in a tertiary care hospital. The study population was recruited from the COVID-19 centre department of the hospital. The study included patients aged 45 years and above with COVID-19 infection. Permission was obtained from the head of the hospital to conduct the study.

The COVID-19 patients who were willing to participate in the study and who met the inclusion criteria were included in this study. Approval from IEC was obtained and all the participants were provided with informed consent forms to participate in the study. A data collection form was prepared which included demographic details such as age, gender, phone number, marital status, financial background, education, clinical examination, and medication.

The study was conducted to assess the mental health status and post-COVID symptoms of the patient using a self-designed validated questionnaire. The scale is composed of 15 items in which the response choices are not at all, mild, moderate, severe, and are rated as 0, 1, 2, and 3, respectively. The scale was designed to measure depression, anxiety, and stress. The 15 questions are sub-divided into 5 questions each in depression, anxiety, and stress [21], [22].

Participants have to select the most appropriate answers from the options in the questionnaire. Each response is added to get the final response. The following cut-offs were used to understand the severity of Depression: 0-4 Normal; 5-8 Mild; >09 Moderate-Severe. For Anxiety: 0-4 Normal; 5-6 Mild; >7 Moderate-Severe. For Stress: 0-4 Normal; 5-8 Mild; >09 Moderate-Severe. [23], [24]

Post-COVID symptoms were analysed through a questionnaire and it was categorized and treatment was charted.

Statistical analysis

SPSS 21 (Statistical Package for the Social Science) statistical software was used for statistical analysis of the study. The chi-square test was used to find the association between variables., P-values <0.05 were considered statistically significant.

RESULT

The study was conducted on 186 participants, 95 (51.1 %) males and 91 (48.97%) females. The majority of the 84 (45%) participants had secondary education and a major portion of the study subjects were belong to middle-class families 120 (65%). Hypertension (58%) was the major comorbid condition in the study population, followed by diabetes (54%), 38% had insomnia and 13% had loss of appetite.

  Of the 186 respondents, a total of 89 respondents had depressive symptoms, from which 52 (28%) and 37(20%) had mild and moderate to severe symptoms respectively. A total of 133 individuals reported having anxiety symptoms, with 73 (39%) mild anxiety and 60 (32%) moderate to severe anxiety. There were 153 responses for stress and of those 64 (34%) experienced mild stress and 89(48%) had moderate to severe stress. The prevalence of depression, anxiety, and stress was measured using a self-designed validated questionnaire.

Using SPSS 21, a Chi-square analysis was done and there was a significant association between depression and gender, educational status, occupation, and loss of appetite. There was a significant association between anxiety and gender, insomnia, and hypertension. Age, gender, educational status, financial status, insomnia, and hypertension showed a significant association with stress.

  Among the study population, 61(32.79%) had fatigue, 52(27.95%) had dyspnoea, 43(23.12%) had joint pain/muscle pain, 38(20.43%) had GI problems, 35(18.82%) had alopecia, 32(17.2%) had insomnia, 16(8.6%) had dizziness, 15(8.06) had loss of appetite,11(5.91%) had cough and 15 (8.06) had other symptoms.

Table no:01 OVERALL MENTAL HEALTH STATUS (n=186)

	Normal	**Mild**	**Moderate-Severe**
Depression	97 (52%)	52 (28%)	37 (20%)
Anxiety	53 (29%)	73 (39%)	60 (32%)
stress	33 (18%)	64 (34%)	89 (48%)

Table:02 DEPRESSIVE SYMPTOMS

		Normal	Moderate	Severe	P Value
Depression levels					
Age	45-50 Years	31	23	14	
	51-55 Years	17	6	5	.794
	56-60 Years	18	7	5	
	61-65 Years	31	16	13	
Gender	Female	56	27	12	.031*
	Male	41	25	25	
Marital status	Married	87	50	31	
	Unmarried	10	2	6	.139
Education	Primary level	37	13	18	
	Secondary level	36	35	13	.002*
	Graduation level	24	4	6	
Occupation	Employed	28	27	14	
	Unemployed	39	10	10	.038*
	Retired	30	15	13	
Financial status	Lower class	19	6	13	.086
	Middle Class	62	37	21	
	Upper Class	16	9	3	
Loss of appetite	No	90	48	24	
	Yes	7	4	13	.000*
Insomnia	No	64	34	18	
	Yes	33	18	19	.161
Hypertension	Yes	56	29	23	
	No	41	23	14	.830
Diabetics	Yes	48	34	19	
	No	49	18	18	.164

*p<0.5

Table:03 ANXIETY SYMPTOMS

		Anxiety Level			
		Normal	Moderate	Severe	P Value
Age	45-50 Years	21	25	22	
	51-55 Years	12	6	10	
	56-60 Years	9	14	7	.176
	61-65 Years	11	28	21	
Gender	Female	30	41	24	
	Male	23	32	36	.010*
Marital status	Married	48	65	55	.951
	Unmarried	5	8	5	
Education	Primary level	15	29	24	
	Secondary level	25	34	25	.468
	Graduation level	13	10	11	
Occupation	Employed	23	24	22	
	Unemployed	16	24	19	
	Retired	14	25	19	.814
Financial status	Lower class	7	16	15	
	Middle Class	34	45	41	.126
	Upper Class	12	12	4	
Loss of appetite	No	47	65	50	
	Yes	6	8	10	.601
Insomia	No	40	40	36	
	Yes	13	33	24	.049*
Hypertension	Yes	38	43	27	
	No	15	30	33	.016*
Diabetics	Yes	29	40	32	
	No	24	33	28	.983

*p<0.5

Table:04 STRESS SYMPTOMS

		Stress level			
		Normal	Moderate	Severe	P value
Age	45-50 Years	15	33	20	
	51-55 Years	6	5	17	
	56-60 Years	4	10	16	.009*
	61-65 Years	8	16	36	
Gender	Female	22	42	31	
	Male	11	22	58	
					.000*
Marital status	Married	32	60	76	
	Unmarried	1	4	13	
					.080
Education	Primary level	9	16	43	
	Secondary level	17	33	34	
	Graduation level	7	15	12	.032*
Occupation	Employed	11	20	38	
	Unemployed	10	28	21	
	Retired	12	16	30	.112
Financial status	Lower class	5	8	25	
					.009*
	Middle Class	18	49	53	
	Upper Class	10	7	11	
Loss of appetite	No	31	54	77	
					.398
	Yes	2	10	12	
Insomnia	No	21	50	45	
	Yes	12	14	44	.002*
Hypertension	Yes	24	40	44	
	No	9	24	45	.046*
Diabetics	Yes	19	40	42	
	No	14	24	47	.158

*p<0.5

Table:05 PREVALENCE OF POST COVID SYMPTOMS

Sl.No	Post-COVID symptoms	Number of populations	Percentage
01	Fatigue	61	32.79
02	Dyspnea	52	27.95
03	Joint/muscle pain	43	23.12
04	GI problems	38	20.43
05	Alopecia	35	18.82
06	Insomnia	32	17.2
07	Dizziness	16	8.6
08	Loss of appetite	15	8.06
09	Cough	11	5.91
10	others	15	8.06

DISCUSSION

COVID-19 is a potentially fatal infection that infected 52 million people worldwide. The onset and spread of the coronavirus created several challenges that affected individuals' economic growth as well as psychological well-being.This cross-sectional retrospective study was conducted on COVID-19-affected patients aged 45 years and above in a tertiary care hospital. Here, we evaluated their mental health status during the COVID-19 pandemic using a self-designed validated questionnaire. To our knowledge, our study was one of the first studies to investigate the impact of the COVID-19 pandemic on the mental health of late middle-aged adults in Kerala, India. Since the pandemic is not over yet and there is a further spread of the pandemic, it is possible that the COVID-19 pandemic can still affect the mental health and well-being of people. Our results provided clear evidence for an overall deterioration in all mental health outcomes, which persisted throughout the COVID-19 pandemic. The result of this study demonstrates that the pandemic and related restrictive measures significantly impacted late middle-aged adults' wellness.

When we compare the prevalence of depression, anxiety, and stress in the present study with another study on late middle-aged Chinese adult by *Zeng et al* [25], findings from our study varies from study of late middle-aged Chinese adult. Their study shows 20.4 %,27.1%and 21.2% depression, anxiety, and stress respectively. A recent study on psychological responses and associated factors during the covid-19 epidemic in China by *Cuiyan Wang et al* [26], showed depressive symptoms; mild (13.8%), moderate (12.2%), and severe (4.3%). The study also showed mild anxiety (7.5%), moderate anxiety (20.4%), and severe anxiety (8.4%). On examining stress, the study revealed mild stress (24.1%), moderate stress (5.5%), and severe stress (2.6%). The mental health status was measured using the DASS-21 scale. Similar to our reports, the study showed higher rates of stress and anxiety and a lower rate of depression. Several factors that were strongly linked to mental health symptoms in late middle-aged people during the COVID-19 pandemic were found in this study. Notably, all reported mental health issues were more common in people with quarantine experience. Gender, financial status, employment status, and comorbidities were associated with mental health problems in the populations.

In our study, some demographic characteristics, especially occupation were associated with depression in the study subject. Similarly, a study on prevalence and risk factors associated with mental health symptoms among the general population in China during the COVID-19 pandemic conducted by *Le Shi et al* [27], found that people with occupational exposure risks reported greater symptoms of depression, anxiety, insomnia, and acute stress. Our study also revealed an association of gender with stress, anxiety, and depression. A similar result was found in a Spanish study conducted by *Maintane Picaza Gorrrochategi et al* [28]. Examining the financial status of our subject, showed an association with stress, a similar result was found in a case study on the Mental health status of late middle-aged adults in China during the COVID-19 pandemic by *Zheng et al* [25]. This revealed that low income was linked with an increased risk of anxiety, stress, and depression. Therefore, people with low income should receive social support. In the present study, insomnia showed a significant association with anxiety and stress. Late middle-aged adults with chronic disease(hypertension) reported an association with anxiety and stress. Similar to our study, a survey of the Spanish population aged above 60 years reported a high prevalence of depressive and anxiety symptoms in individuals with chronic disease. As COVID-19 pandemic continues to spread, our findings will provide vital guidance for the development of a psychological support strategy and areas to prioritize in Kerala and other places affected by the pandemic.

Among the study population of age 45 years and above as shown in the **Table:05**, out of 186 subjects, 61(32.79%) had fatigue, 52(27.95%) had dyspnoea, 43(23.12%) had joint pain/muscle pain, 38(20.43%) had GI problems, 35(18.82%) had alopecia, 32(17.2%) had insomnia, 16(8.65%) had dizziness, 15(8.06%) had loss of appetite, 11(5.91%) had cough and 15(8.06%) had other symptoms. Compared to an early report on the post-COVID syndrome in non-hospitalized patients with COVID-19 conducted in Germany, Europe by *Max Augustin et al* [29], our study showed a higher rate of fatigue (27.95%), while theirs showed a lower rate (14.7%). In investigating the rate of dyspnoea in subjects, our study showed a higher rate (23.12%) compared to the European study (13.6%). Their study also showed a lower rate of alopecia (2.5%) compared to our study (17.2%). Similarly, a recent study on post-discharge persistent symptoms and health-related quality of life after hospitalization for COVID-19 by *Garrigues et al* [30], showed higher rates for cough (16.7%), fatigue (55%), dyspnoea (41.7%), alopecia (20%) and insomnia (30.8%) compared to our study. Using this approach, we identified fatigue, dyspnoea, cough, insomnia, and alopecia as the most common symptoms in PCS patients. The scope of this study suggests that the forefront of clinical care for acute COVID-19, there are multiple guidelines, recommendations, and best practices that need to be extended to the management of post-COVID syndrome. This study suggests more specific clinical research associated with post-syndrome.

This study confirms that the ongoing COVID-19 pandemic has a huge psychological impact on individuals as they manifest depression, anxiety, and stress. The study also suggests the importance of targeted intervention on the mental health and well-being of people during the pandemic.

CONCLUSION

In this cross-sectional study conducted among the middle-aged population infected with COVID-19, we are evaluating their mental health status during covid-19 pandemic and analyzing the presence of any post-syndrome. The study is a report on the psychological effects of the coronavirus epidemic on middle-aged people. The purpose of this survey was to get a glimpse into the psychological effects of the epidemic. The study data showed changes in the overall psychological profile of the COVID-19 victims and these changes were manifested as stress, anxiety & depression. Psychological aspects are known to influence physical health and health behaviour, as well as adherence to public health initiatives and how people cope with the fear of illness and subsequent losses.

To guard against the probable persistent symptoms reported in the current evaluation, a complete investigation and knowledge of all elements involved with long-term COVID-19 is required. The study also analyses the occurrence of any post-COVID syndrome after the hospital discharge. When compared to identical persons in the general population, those discharged from the hospital following acute COVID-19 had a higher risk of developing post-COVID syndrome. The study assessed the

presence of these symptoms along with the corresponding comorbidities of the patients. The study only indicates the presence of post-syndrome. To further understand the incidence, clinical spectrum, pathophysiology, and prognosis of several post-syndromes, more studies are needed.

SCOPE

At the forefront of clinical care for acute COVID-19, there are multiple guidelines, recommendations, and best practices that need to be extended to the management of post-COVID syndrome. This study suggests more specific clinical research associated with post-syndrome.

This study confirms that the ongoing COVID-19 pandemic has a huge psychological impact on individuals as they manifest depression, anxiety, and stress. The study also suggests the importance of targeted intervention on the mental health and well-being of people during the pandemic.

CONFLICT OF INTEREST

The authors have no conflicts of interest regarding this investigation.

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