



(RESEARCH ARTICLE)



## Psychometric evaluation and medication usage pattern in Covid-19 patients: A retrospective study

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### Abstract

**Aim and objective:** Assessing and evaluating Psychometric and medication usage patterns in COVID-19 patients retrospective study. assessing the post-COVID-19 subjects, evaluating the drug report in a post-COVID-19 subject, and measuring psychological status. Evaluation of the serious adverse reaction on the south-Indian population of the post-COVID-19 subject.

**Methodology:** In which 150 subjects were taken and 127 participated. Inclusion criteria COVID-19 subject with adult age group, Patient was admitted and discharged before 3 months and above for COVID-19 with positive RT-PCR Report exclusion criteria patient who is recently tested for COVID-19 and pregnant women and lactating women and who are below the adult age group. Where follow-up is done to assess the psychometric evaluation it is a retrospective study with follow-up.

**Result:** 127 patients were analyzed, in that there are 49 female subjects and 78 male subjects, therefore a total of 1 of 27 patients. The vaccination status of the subjects was analyzed with the data depleted. In that, 118 subjects were affected by Covid-19 before vaccination and only 9 subjects were affected after vaccination. In this pandemic, many subjects were Mentally stressed by their Neighborhood and 32 subjects were not stressed. The generalized anxiety disorder score shows that 15 subjects were currently experiencing low risk, 58 subjects were in the mild range, 32 subjects were in the moderate range and 22 subjects were in the mild range. The discharge medication data shows Vitamin C and Multivitamin tablets were prescribed nearly for 114-116 subjects, secondly, Pantoprazole was prescribed for 96 subjects, thirdly Prednisolone was prescribed for 96 subjects and Paracetamol was prescribed for 68 subjects. At last, other drugs are prescribed according to the Co-Morbidities of the subject.

**Conclusion:** 127 patients were analyzed, in that there are 49 female subjects and 78 male subjects. 85 subjects were affected between ages 18-60 years whereas 42 subjects were affected above the age of 60 years. The vaccination and the non-vaccination status report shows that non-vaccinated people are affected more than vaccinated people. The Generalized Anxiety Disorder (GAD) category depletes that the patients experienced mild to moderate levels of anxiety. The Pearson Chi-square value is 23.271 and the P value is <0.001. This shows the association between anxiety with COVID-19 patients. The Major Depression Inventory (MDI) score depletes severe depression which might be due to the pandemic situation, economic situation, and local restrictions. The Pearson Chi-square value is 70.572 and the P-value is <0.001 showing that there is an association between depression and COVID in patients. This shows that post-COVID-19 affected subjects are experiencing Psychological effects in many terms. These Psychological effects are due to COVID-19 and the intake of Steroids during the treatment and after discharge.

**Keywords:** Psychometric; COVID-19; Psychological status; Anxiety; Depression; Post-COVID-19 Complication

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## 1. Introduction

COVID-19 first appeared in Wuhan, in late 2019 and spread globally, which is caused by new severe acute respiratory syndrome coronavirus -2(SARS-COV-2).<sup>[1,2,3]</sup> Early symptoms include fever, loss of taste, loss of smell, persistent cough, tiredness, etc which occur after 5-10 days of infection, then the symptoms become severe and may lead to hospitalization after 2 weeks due to breathing problems as mechanical ventilation is needed. Thus they eventually lead to organ damage and may result in long-term health problems.<sup>[2,4,5]</sup> This disease appears to be linked to age and pre-existing conditions, including cardiovascular disease and diabetes mellitus. Several COVID-19 vaccines have also been developed and were successful.<sup>[3,6,5]</sup> Lack of effective treatment options and unpreparedness for the pandemic increased the mortality rate. Most patients were infected with mild to moderate illness which required symptomatic treatment and quarantine.<sup>[7,8,9]</sup> Whereas severe illness or chronic disease may lead to hospitalization and death. Only symptoms-based care and oxygen therapy are given to hospitalized patients.<sup>[10,11]</sup> Many drugs have been touted as treatment options and repurposing/ reprofiling of drugs were done. Repurposing/ reprofiling is a process of identifying the existing drug for new indications. Thus, it is estimated that 75% of existing drugs can be repurposed for novel indications for COVID-19 treatment.<sup>[12,13]</sup> A wide range of repurposed drugs includes dexamethasone, remdesivir, tocilizumab, and azithromycin for management in hospitalization. Healthcare professionals managed the situation and patients according to guidelines issued by the World Health Organization (WHO). Systemic corticosteroids like dexamethasone, hydrocortisone, methylprednisolone, and prednisolone were used in COVID patients. Anti-coagulants were also advised as there is no role for antibiotics not recommended.<sup>[14,15,16]</sup> Psychological reactions such as depression, anxiety, panic attacks, and post-traumatic symptoms were also seen in COVID patients which is the emotional impact of the pandemic. A study in Spanish also showed psychotic episodes in non-infected patients which is probably triggered by the stressful success of the pandemic.<sup>[2,4,17]</sup> But during the pandemic, less attention was given, to studying the direct role of the virus of development on neuropsychotic symptoms as secondary psychosis. A new onset of psychotic symptoms has been described in patients infected by previous coronavirus-infected patients. Thus possible etiological factors like viral exposure and treatment are used to manage the infection and psychosocial stress.<sup>[5,6,18]</sup> Thus the behavioural response to adapt to all conditions should be given which helps in adapting to the pandemic recommendation made by the government and healthcare organizations.<sup>[7,3,19]</sup> The pandemic recommendations include maintaining social distancing, identifying the symptoms, following the protocol, and managing the mild symptoms of COVID-19 at home under restrictions to avoid contagion and spreading of the disease.<sup>[8,9,20]</sup> Thus according to protection motivation theory (PMT) self-efficacy is the one majorly used to health-related behaviors. Hence, individualized self-efficacy in prevention, recognizing the symptoms, and home managing of symptoms should be analyzed. Thus our study aims to evaluate the drug pattern in utilization of repurposing and other potential options and psychometric analysis among COVID patients<sup>[21,22]</sup>

## 2. Methodology

A hospital-based study was done for one month among the patients in the tertiary care hospital. The study protocol was approved by the ethics committee of the institute. A total of 150 participants were included in the study after fulfilling the inclusion and exclusion criteria for the study. Participants were recruited after obtaining the consent. The inclusion criteria include patients of both sexes who are of adult age with post-COVID-19 with or without comorbidities. The exclusion criteria include patients recently tested as COVID-19 positive, pregnant women and lactating women, and patients below adult age. The data are collected from the MRD room as this is a retrospective study conducted in a tertiary care hospital. According to inclusion criteria, the data are collected and filled in the case report form. Then, a telephonic follow-up conversation is done to assess the current symptoms and psychological issues. Out of 150 subjects, 127 subjects responded and were evaluated. Two scales were used GAD-7 and MDI scale were used.

**GENERALIZED ANXIETY DISORDER ASSESSMENT [GAD-7]:** It is easy to use self administrating patient questionnaire which is used as a screening tool and severity is measured for GAD. The GAD-7 score is calculated by assigning 0,1,2 and 3 to those who responded as not at all, several days, more than half the day, and nearly every day respectively by adding the scores of seven items. Scores of 5, 10, and 15 are taken as cut-off points for mild, moderate, and severe anxiety. When using a screening tool, further evaluation is recommended when the score is 10 or greater. Using the threshold of 10 scores, the sensitivity is 89% and the specificity is 82% for GAD. It is moderately good at screening 3 other common anxiety disorders- panic disorder (sensitivity 74%, specificity 81%), social anxiety disorder (sensitivity 72%, specificity 80%), and post-traumatic stress disorder (sensitivity 66%, specificity 81%).

**MAJOR DEPRESSION INVENTORY (MDI):** The most commonly utilized measures of depression were created before the release of the Diagnostic and Statistical Manual of Mental Disorder III (DSM III). Consequently, new tools were formulated as MDI, which is a self-rated tool that has a dual function, it can be either a diagnostic instrumental tool that

assesses the presence of depression or measure the severity and degree of depression. It consists of 122 items, items 8-100 involving 2 sub-items, a and b all scored on the frequency response scale ranging from none of the time (0) to all of the five (5) and is answered in the context of last 2 weeks. Hence, functionally it contains 10 items as only the highest score is either a or b counted in both 8-10.

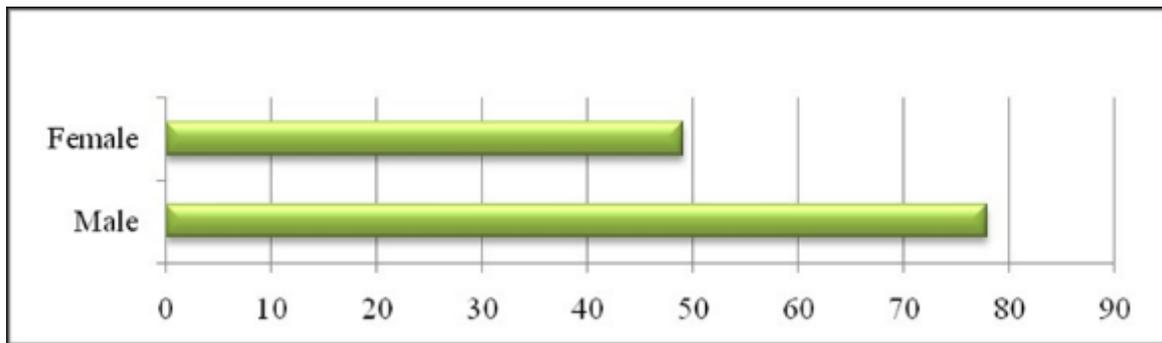
**SCORING:** Using the MDI as a measure of depression severity: a total score of ten items was calculated by adding together 10 scores. The total score range is 0-50. 0-20 indicates depression does not exist or its existence is doubtful, 21-25 indicates mild depression, 26-30 indicates moderate depression and 31-50 indicates severe depression. Using the MDI as a diagnostic tool: an algorithm for DSM-IV diagnosis of major depression; Items 4 and 5 are combined and only the highest answer of the two is considered. The presence of at least 5 of 9 symptoms indicates a diagnosis of major depression. Item 1 or 2 must be among the 5 or more symptoms. The clinical range incorporates Items 1 to 3 occurring most of the time or all of the time, and all other symptoms occurring either slightly more than half of the time, most of the time, or all of the time. If 5 or more symptoms are in this range, a diagnosis of major depression is support

**STATISTICAL ANALYSIS:** The statistical analysis is done by using a statistical package for the social sciences and software (SPSS). A descriptive analysis for continuous and categorical variables is done. The normality is checked by the Kolmogorov-shapiro test. The descriptive statistics were given by frequency and percentage, mean and standard deviation, and median and interquartile range.

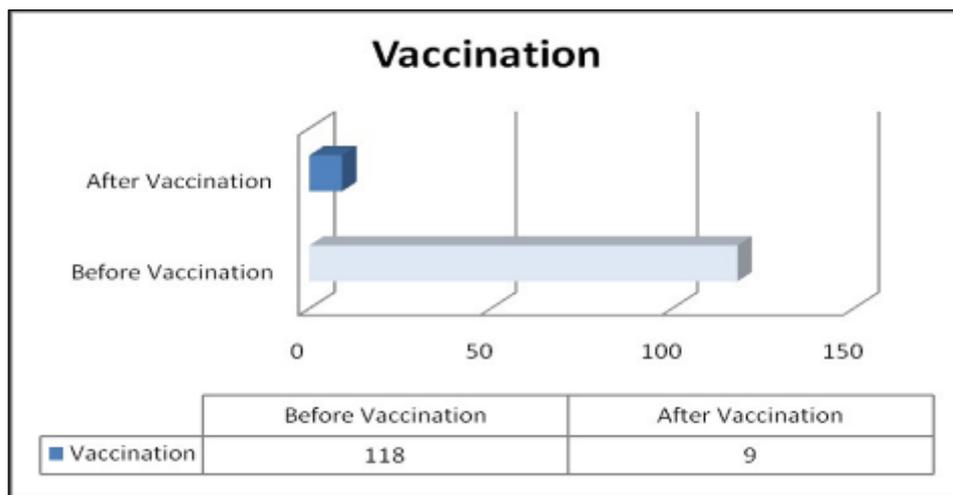
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### 3. Results

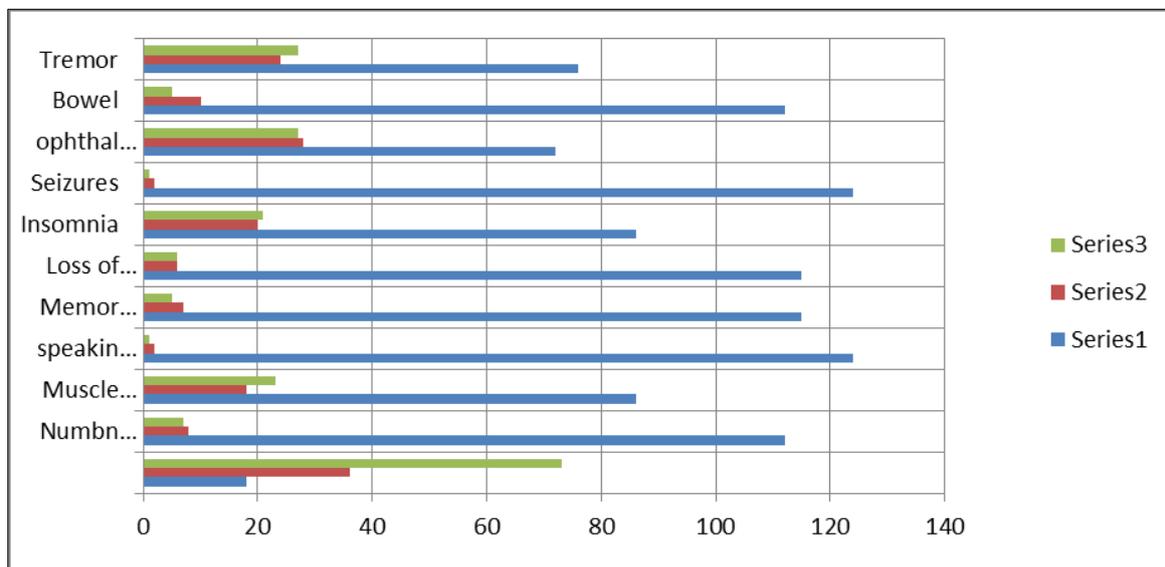
A total of 150 participants were included out of which 127 participants were involved in the complete study. The 127 participants' data was analyzed, in that there are 49 female subjects and 78 male subjects. The data on patients' vaccination status was collected where 118 subjects were affected by Covid-19 before vaccination and only 9 subjects were affected after vaccination and all the participants were vaccinated. The symptoms experienced before and after the study are explained. Before the study the patients experienced weakness in face, arm and leg (36 patients), numbness or loss of feeling in leg, arm and face (8 patients), muscle stiffness (18 patients), speaking disability(2 patients), memory problem (7 patients), loss of consciousness (6 patients), insomnia (20 patients), seizure (2 patients), ophthalmic (28 patients), bowel (10 patients) and tremor (24 patients). The symptoms which the patients experienced during the study were weakness in the face, arm, and leg (73 patients), numbness or loss of feeling in leg, arm and face (7 patients), muscle stiffness (23 patients), speaking disability(1 patients), memory problem (5 patients), loss of consciousness (6 patients), insomnia (21 patients), seizure (1 patients), ophthalmic (27 patients), bowel (5 patients) and tremor (27 patients). The drug assessment data during patient illness depicts 107 subjects were administered antipyretic, Anticoagulant, and Anti-Platelet. Supplements and minerals were given to 125 subjects, and Corticosteroids and Steroids were given to 74 subjects. Proton pump inhibitor was given for 116 subjects, Anti-diabetic was given for 46 subjects, Antihistamine, and Anti-allergy drugs were given for 67 subjects, Antibiotics were given for 106 subjects, and Anti-Diarrheal was given for 4 subjects whereas Probiotics were given for 22 subjects. Anti-tussive was given for 13 subjects. Janus kinase inhibitors were given to 4 subjects while Bronchodilators were given to 28 subjects. Remdesivir was given for 40 subjects. Anti-asthmatics and COPD preparations were given to 63 subjects. Hepatic protectors were given for 8 subjects. Hypnotics and Sedatives were given to 8 subjects. Anti-Emetics were given for 24 subjects. Anti-Anginal and Beta Blockers were given for 10 subjects, and Antihypertensive for 9 subjects. Antiviral was given for 8 subjects. Antifibrinolytics were given for 1 subject while Antacid was given for 2 subjects. Thyroid Hormones were given for 7 subjects. In this pandemic, many subjects were Mentally stressed by Neighborhood and 32 subjects were not stressed. The generalized anxiety disorder score shows that 15 subjects were currently experiencing low risk, 58 subjects were in the mild range, 32 subjects were in the moderate range and 22 subjects were in the mild range. Major Depression Inventory data shows 78 subjects are experiencing no or doubtful depression 55 subjects are between 18-60 age and 23 subjects are above 60 age.14 subjects are experiencing mild depression in that 9 subjects are between 18-60 age and 5 subjects are above 60 age.11 subjects are experiencing moderate depression 9 subjects are between 18- 60 age and only 2 subjects are 60 age. Totally 24 subjects are experiencing severe depression in that 12 subjects are between 18-60 age and 12 subjects are above 60 age. The discharge medication data shows Vitamin C and Multivitamin tablets were prescribed nearly for 114-116 subjects, secondly, Pantoprazole was prescribed for 96 subjects, thirdly Prednisolone was prescribed for 96 subjects and Paracetamol was prescribed for 68 subjects. At last, other drugs are prescribed according to the Co-Morbidities of the subject.



**Figure 1** Age distribution between the study populations



**Figure 2** Vaccination history of the study population based on covid attack



**Figure 3** Representations of symptoms before and during the covid-19

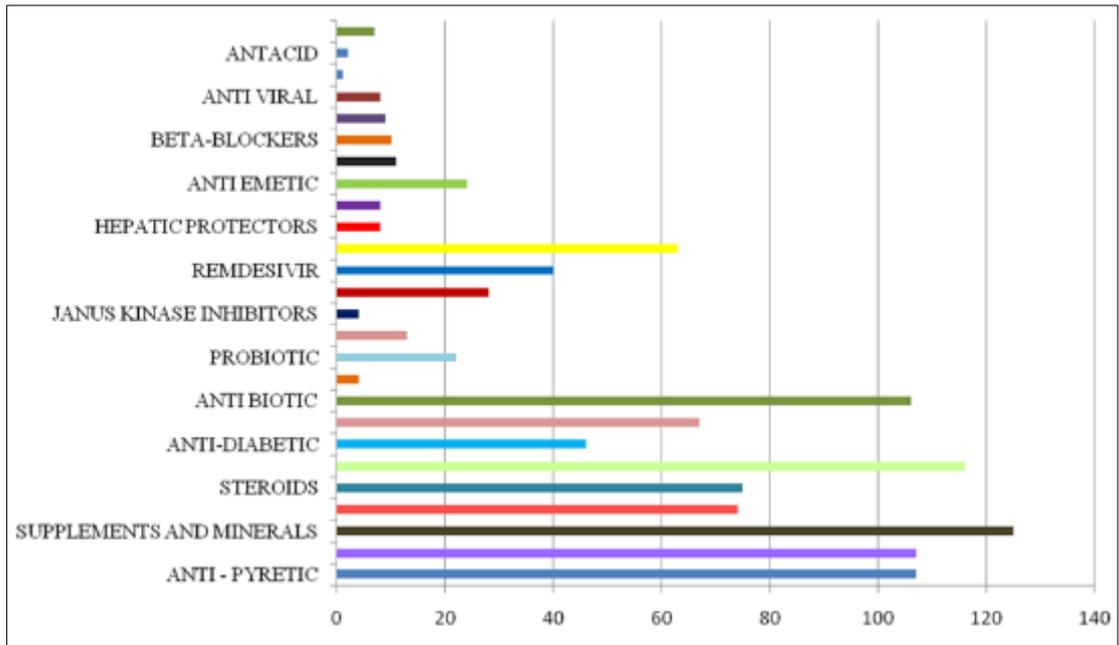


Figure 4 Medication of the study population

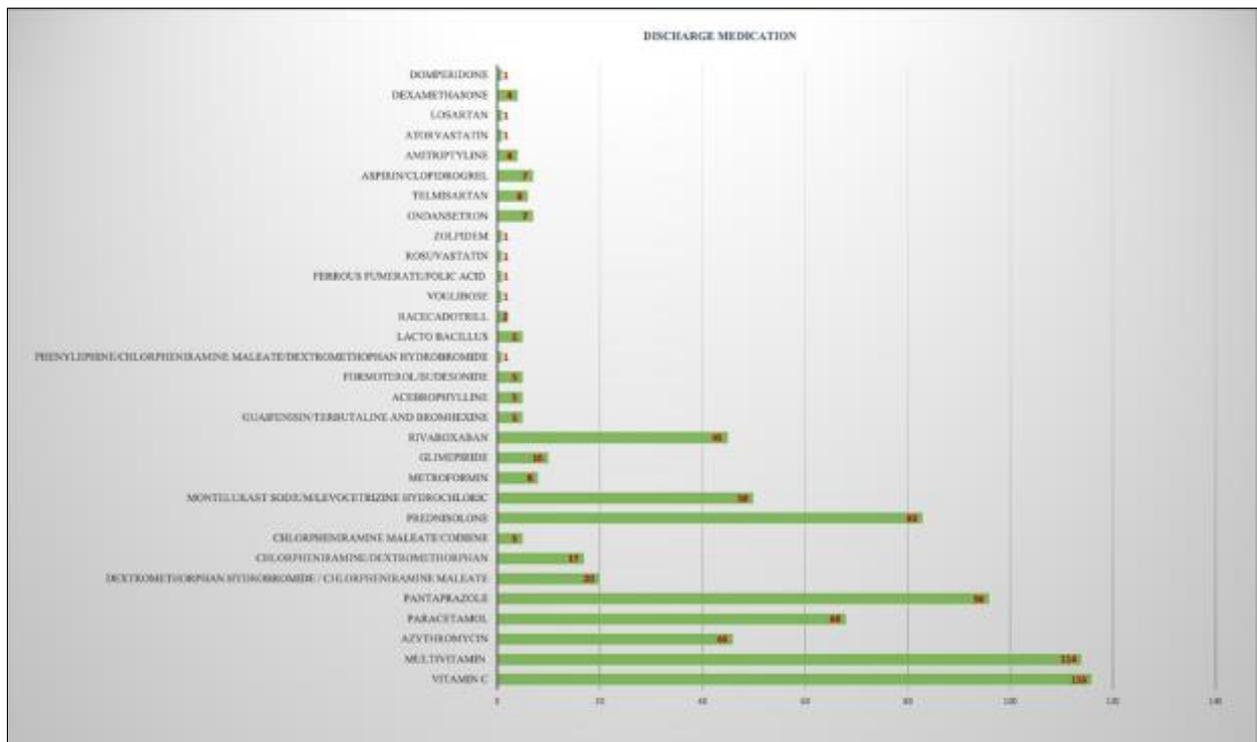


Figure 5 Discharge medication of the study population

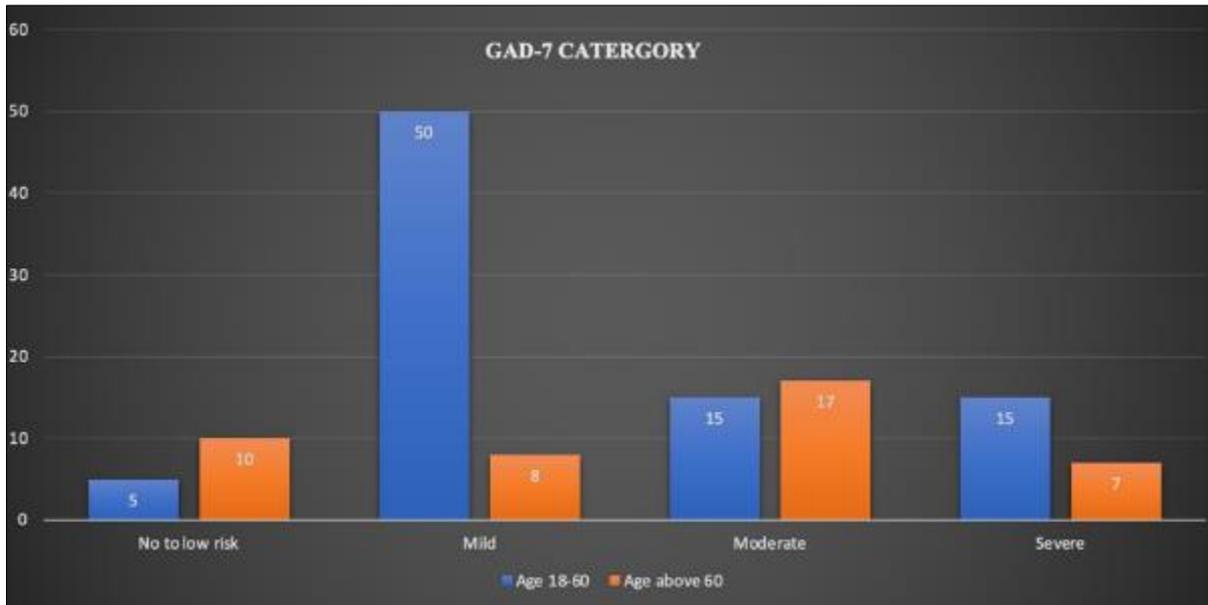


Figure 6 GAD-7 category

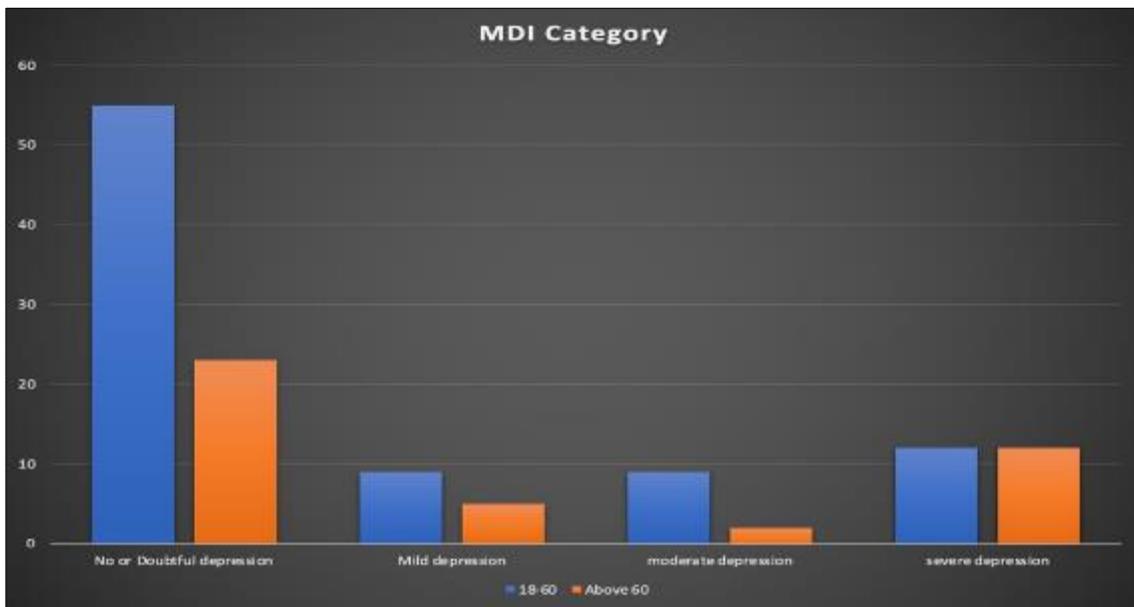


Figure 7 MDI category

#### 4. Discussion

The COVID-19 pandemic has imposed great challenges on healthcare systems worldwide. Some literature has been published on the clinical aspects of, possible treatments for and risk factors in patients with COVID-19. [23,24]The epidemiology of the drug use profiles in patients with COVID-19 is noted and psychometric analysis is done in this study. The study also includes psychometrical analysis based on GAD-7 and MDI scale scoring. When a psychometric instrument is developed, we carefully examine its validity and reliability. Validity refers to the ability of the instrument to measure the construct that it intends to measure, reliability refers to the ability to produce accurate and consistent results. A total of 150 participants were included out of which 127 participants were involved in the complete study. The 127 participants' data was analyzed, in that there are 49 female subjects and 78 male subjects. The data on patients' vaccination status was collected where 118 subjects were affected by Covid-19 before vaccination and only 9 subjects were affected after vaccination and all the participants were vaccinated. The symptoms experienced before and after the study are explained. Where before the study the patients experienced weakness in the face, arm, and leg (36 patients), numbness or loss of feeling in leg, arm and face (8 patients), muscle stiffness (18 patients), speaking

disability(2 patients), memory problem (7 patients), loss of consciousness (6 patients), insomnia (20 patients), seizure (2 patients), ophthalmic (28 patients), bowel (10 patients) and tremor (24 patients). The symptoms which the patients experienced during the study were weakness in the face, arm, and leg (73 patients), numbness or loss of feeling in leg, arm and face (7 patients), muscle stiffness (23 patients), speaking disability(1 patients), memory problem (5 patients), loss of consciousness (6 patients), insomnia (21 patients), seizure (1 patients), ophthalmic (27 patients), bowel (5 patients) and tremor (27 patients). The drug assessment data during patient illness depicts 107 subjects were administered antipyretic, Anticoagulant, and Anti-Platelet. Supplements and minerals were given to 125 subjects, and Corticosteroids and Steroids were given to 74 subjects. Proton pump inhibitor was given for 116 subjects, Anti-diabetic was given for 46 subjects, Antihistamine, and Anti-allergy drugs were given for 67 subjects, Antibiotics were given for 106 subjects, and Anti-Diarrheal was given for 4 subjects whereas Probiotics were given for 22 subjects. Anti-tussive was given for 13 subjects. Janus kinase inhibitors were given to 4 subjects while Bronchodilators were given to 28 subjects. Remdesivir was given for 40 subjects. Anti-asthmatics and COPD preparations were given to 63 subjects. Hepatic protectors were given for 8 subjects. Hypnotics and Sedatives were given to 8 subjects. Anti-Emetics were given for 24 subjects. Anti-Anginal and Beta Blockers were given for 10 subjects, and Antihypertensive for 9 subjects. Antiviral was given for 8 subjects. Antifibrinolytics were given for 1 subject while Antacid was given for 2 subjects. Thyroid Hormones were given for 7 subjects. In this pandemic, many subjects were Mentally stressed by Neighbourhood and 32 subjects were not stressed. The generalized anxiety disorder score shows that 15 subjects were currently experiencing low risk, 58 subjects were in the mild range, 32 subjects were in the moderate range and 22 subjects were in the mild range. Major Depression Inventory data shows 78 subjects are experiencing no or doubtful depression 55 subjects are between 18-60 age and 23 subjects are above 60 age.14 subjects are experiencing mild depression in that 9 subjects are between 18-60 age and 5 subjects are above 60 age.11 subjects are experiencing moderate depression 9 subjects are between 18 and 60 age and only 2 subjects are 60 age. Totally 24 subjects are experiencing severe depression in that 12 subjects are between 18-60 age and 12 subjects are above 60 age. The discharge medication data shows Vitamin C and Multivitamin tablets were prescribed nearly for 114-116 subjects, secondly, Pantoprazole was prescribed for 96 subjects, thirdly Prednisolone was prescribed for 96 subjects and Paracetamol was prescribed for 68 subjects. At last, other drugs are prescribed according to the Co-Morbidities of the subject.

We observed a high rate of corticosteroids used like dexamethasone, prednisolone, etc. Ivermectin was repurposed for COVID-19 treatment in our study it was used which gave consistent association with another study.<sup>[25]</sup> Remdesivir was recommended for use in this study for hospitalized patients which also was used as treatment in hospitalized patients in another study.<sup>[26]</sup> Antibiotics are not recommended for use in this study except for secondary infection. For pneumonic symptoms alone empirical antibiotics coverage was given. So the tests are done to give the proper treatment which also emphasizes the need for appropriate de-escalation of antibiotic therapy based on the result of culture testing.<sup>[27,28]</sup> A higher rate of azithromycin was given to reduce the throat infection but was highly discouraged later. Anticoagulants were also prescribed in the majority.<sup>[29,30]</sup> The microvascular and macrovascular thrombotic complications may lead to prescribing anti-thrombotic or anti-coagulants like rivaroxaban and heparin (enoxaparin) to the patients. The higher rate of omeprazole which is a proton pump inhibitor was also used in the treatment of COVID-19 to give a prophylactic treatment to reduce the stress in ulcers and reduce gastric bleeding.<sup>[31,32]</sup> In psychometric analysis, it showed mild to moderate anxiety in the adult-aged population based on the GAD-7 category scale which means anxiety was present in the patient population which was consistent with the other study results.<sup>[30,33]</sup> The MDI scale showed severe depression which has made consent as this has created pressure on the population which gave a consistent result based on other study results.<sup>[27,29,32]</sup>

Our study was designed to evaluate the psychometric and drug utilization pattern of drugs given during COVID-19. COVID helps in repurposing many drugs and also helped in studying anxiety and depression where the patients had mild to moderate levels of anxiety and severe depression which made the population affect the emotional status.<sup>[30,26,25,34]</sup> This delineated the drug use profiles and epidemiological and demographic characteristics of our study patients with COVID-19. This information provides evidence of the association between drug utilization and psychometric analysis in COVID-19 risk, giving us a solid background for further analyses and interpretations using new data.

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## 5. Conclusion

A total of 127 patients were analyzed, in that there were 49 female subjects and 78 male subjects. 85 subjects were affected between ages 18-60 years whereas 42 subjects were affected above the age of 60 years. The vaccination and the non-vaccination status report shows that non-vaccinated people are affected more than vaccinated people. The Generalized Anxiety Disorder (GAD) category depletes that the patients experienced mild to moderate levels of anxiety. The Pearson Chi-square value is 23.271 and the P value is <0.001. This shows the association between anxiety with COVID-19 patients. The Major Depression Inventory (MDI) score depletes severe depression which might be due to the

pandemic situation, economic situation, and local restrictions. The Pearson Chi-square value is 70.572 and the P-value is <0.001 showing that there is an association between depression and COVID in patients. This shows that post-COVID-19 affected subjects are experiencing Psychological effects in many terms. These Psychological effects are due to COVID-19 and the intake of Steroids during the treatment and after discharge.

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## Compliance with ethical standards

### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

### *Statement of Ethical Approval*

This study was approved by Hindu Mission Hospital, Chennai Institutional Ethics Committee. IEC APPROVAL NO: HMH\IEC/2022/STEA19.

### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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