Original Research Article

Prevalence of Psychological Disorders with Presence of Comorbidities during COVID-19 Outbreak in the Population of Maharashtra State: A Correlational Study

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ABSTRACT

Background: The nCOV first reported in Wuhan, China, was declared as a Public Health Emergency by WHO. India reported its first case in January 2020 and to curb the rate of spread of disease lockdown was declared by PM Modi, in phases. Isolation prevents the spread, but lack of social access gives rise to psychological problems such as Anxiety, Depression and Anger. Also WHO suggested that the people having comorbidities are more vulnerable in the pandemic, thus adding to psychological turmoil in them.
Aim: To study prevalence of Psychological disorders with presence of Comorbidities during COVID-19 outbreak in the population of Maharashtra State.
Method: A survey questionnaire, divided into 5 section directed towards socio-demographic variable, prevalent health condition, awareness about Covid19, psychological well-being, sleep and appetite was circulated, in form of Google forms, in various regions of Maharashtra. Approximately 300 participants participated, out of which 60 people for each normal and comorbid population groups were selected randomly. The obtained data was analyzed using Excel 2007 and statistically by using Graph Pad Prism 8.4.2.
Result: Participants confirmed moderate knowledge about the pandemic symptoms. Both the population groups reported an increase in psychological turmoil. The comorbid population reported a significant increase in the psychological distress associating it to the prevalent health condition.

Conclusion: Analysis of the data proved that mental health of this population has to be improved and interventions are required. In Lockdown situation, presence of comorbidities further increases psychological impaction making this population more vulnerable giving rise to another invisible pandemic.

Keywords: Comorbidity, Anxiety, Depression, Anger, nCOV.

INTRODUCTION

The Novel Corona virus disease (2019) was first reported in Wuhan, China on 31st December, 2019 as a case of pneumonia with unknown cause and was later declared as the Public Health Emergency by WHO on 30th January, 2020[1]. The disease can cause common symptoms like fever, dry cough and tiredness and around 1 out of every 5 people who gets COVID-19 gets seriously ill and develops difficulty in breathing [2].

First confirmed case of nCOV in India was diagnosed on 30th January, 2020[3] and the first case of the disease in Indian state of Maharashtra was confirmed on 9th March, 2020[4]. As of Wednesday, May 13, Maharashtra's mortality rate stood at 3.76%, a significant improvement from the first few days of April, but still above the national average of 3.23% [5].With respect to the same, as the number of confirmed COVID-19 positive cases closed 500, PM Modi on 19 March, asked all citizens to observe 'Janata Curfew' (people's curfew) on

Sunday, 22 March. Following this, lockdown was declared as per below format by honorable PM Modi: -

- Phase 1: 25 March 2020 – 14 April 2020 (21 days)
- Phase 2: 15 April 2020 – 3 May 2020 (19 days)
- Phase 3: 4 May 2020 – 17 May 2020 (13 days)[6].

Although isolation helps in achieving the goal of reducing infections, reduced access to family, friends, and other social support systems causes loneliness increasing mental issues like anxiety and depression[7]. Mental illness amounts to one-sixth of all health-related problems and it's a worldwide concern. The recent survey by the Indian Psychiatry Society (IPS) highlights a sudden rise in patients suffering from some sort of mental illness [8].

To confirm the impact of lockdown on human behaviours and mental health, we conducted the research to look into psychological intervention and adopt necessary measures which is the need of the hour today with increased COVID-19 cases.

More so, WHO has confirmed that older people, and those with underlying medical problems like high blood pressure, heart and lung problems, diabetes, or cancer, are at higher risk of developing serious illness[2]. So to study the effect in this vulnerable population with pre-existing comorbidities versus normal population undergoing same lockdown situations, this research was undertaken, especially in the state of Maharashtra which has the maximum number of positive cases recorded till date. Lack of quality research about the same fuelled the need of the study thus throwing light on mental health issues and awareness.

MATERIAL AND METHOD

- ***Study Design: -***
   We adopted a cross-sectional survey design to assess the psychological response during the lockdown situations of pandemic COVID-19 in the Indian state of Maharashtra. In this observational study Convenient Sampling Technique was implemented by using a self structured questionnaire which was developed in two languages, English and Marathi by using Google Forms with a consent form appended to it.

Questionnaire was sent through social media platforms like Whatsapp, Facebook and Text messages to recruit the population all over Maharashtra of the age group 20-65 years. This survey was conducted from April 24, 2020 to May 1, 2020 when state of Maharashtra was experiencing phase-2 of the lockdown.

- ***Study Set-up and Procedure: -***
   The Google form link was circulated amongst all the social media contacts and they were requested to roll out the survey to as many people as possible. The link led the participants to the questionnaire beginning with selection of preferred language after which an informed consent was taken. Consented participants were directed towards the online questionnaire containing three sections. First section consisted of the socio-demographic variables of Name, Age, Gender, City, Residence, Education, Profession, Height and Weight. Height and Weight thus recorded were utilized for calculation of the Body Mass Index (Quetelet Index) to determine prevalence of obesity. A question about prevalent health condition with presence of any Co-morbidity such as Diabetes or Hypertension followed after this to divide the population into two groups Normal without the presence of Diabetes, Hypertension or Obesity and Co-morbid. The next section included 17 questions directed towards the psychological well being of the participants consisting of questions related to sleep, Appetite, Anxiety, Depression and Anger. The last section reported the symptoms as well as confirmed the awareness about prevalent pandemic COVID-19. Clinical scales were referred for formulating 17 questions in section two out of which 8 were YES/NO question, 7 were graded on a four point Likert scale. These were further

divided into 3 segments of 5 questions each about psychological factors of Anxiety, Depression and Anger. The question about sleep and appetite recorded their response on five point Likert scale. [Questionnaire]

- *Sample Selection :-*

We have recorded a total of 300 responses out of which 60 responses for Normal population and Co-morbid population each were randomly selected. Population from age group 20-65 belonging to diverse areas of Maharashtra like Urban, Rural and Semi-Urban, having access to the internet facility were included in the study.

- *Data Analysis:-*

Descriptive statistics for the data obtained from both the population was formulated using Microsoft Excel 2007. The 15 questions indicating the psychological factors were graded on a suitable point scale devised by the investigator. The individual section scores of Anxiety, Depression and Anger were calculated based on the point scale and then the total score of every subject was calculated for further statistical analysis. The Welsch t test and 2 ways ANOVA with Dunnet test were used to statistically calculate the significance between the total scores of Co-morbid and Normal population. The whole statistical analysis was done using GraphPad Prism 8.4.2 software.

RESULT

An online survey regarding Prevalence of Psychological disorders with presence of Comorbidities during COVID-19 outbreak in the population of Maharashtra State was conducted. All together 300 participants participated in this study out of which randomly 60 participants were chosen for each group that is Co-morbid population and Normal(Control) Population. All of the 120 subjects were between the age group 20- 65 years with an average age of 38 years.

SECTION 1: - Awareness about COVID 19 and Symptoms:-

Around 30% of Normal population and 23.3% of Co-morbid population had complete knowledge about COVID-19. Moderate knowledge was recorded in 63.3% of Normal population and 48.3% in Co-morbid population. About 5% of Normal population and 25% of Co-morbid population had slight knowledge about COVID19 and 1.7% of normal population and 3.3% of co-morbid population had no knowledge about COVID19.

SECTION 2: - Anxiety as a psychological response.

In the questionnaire around 5 questions were asked about psychological factor of anxiety which were given 5 points for the convenience of calculation of scores. It was found that the average score of the Co-morbid population was 3.03 and that of Normal population was 2.61. [Result_Graphs: I]

SECTION 3: - Depression as a psychological response.

The survey contained 5 questions about psychological factor of Depression which were given 5 points for the convenience of calculation of scores as like the Anxiety. The average score of the Co-morbid population was 1.92 and that of Normal population was 1.22. [Result_Graphs: II]

### SECTION 4: - Anger as a psychological response.

5 questions in the questionnaire were dedicated to the psychological factor of Anger and was given the same point scale as of the above two section that is of 5 points. According to the data obtained the average score of the Co-morbid population was 2.16 and that of Normal population was 1.76. [Result_Graphs: III]

SECTION 5: - Total Scores and Statistical significance.

After obtaining the scores from all of the above sections the total score of the each population was calculated and the average of total score of Co- Morbid population was found to be 7.12 and that of the Normal population was found to be 5.61. After application of statistical tests of Two way ANOVA and Welsch T- test the significance was found at an alpha value of 0.05(P <0.05). [Result_Graphs: IV]

1) Graphs of Results: -

(I)

(II)

(III)

(IV)
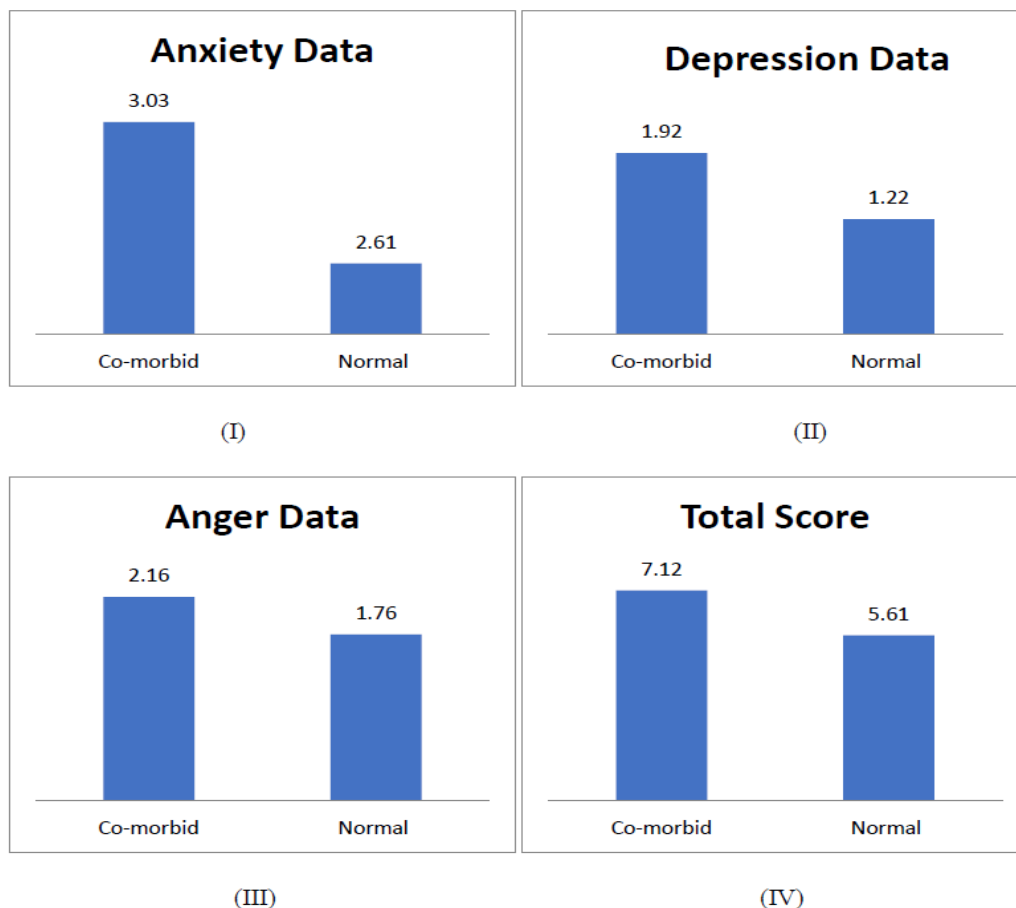
DISCUSSION

A pandemic is an epidemic occurring on a scale that crosses international boundaries, usually affecting people on a worldwide scale .Throughout the human history till now there have been many pandemics such as Smallpox, Tuberculosis and Plague which affected a substantial number of people [9].

Similarly, Novel Corona Virus Disease (nCOVID) is the infectious disease caused by the most recently discovered coronavirus. This new virus and disease were unknown before the outbreak began in Wuhan, China, in December 2019 which is now a pandemic affecting many countries globally [10]. The most common symptoms of COVID-19 are fever, dry cough, and tiredness. Other symptoms that are less common and may affect some patients include aches and pains, nasal congestion, headache, conjunctivitis, sore throat, diarrhea, loss of taste or smell or a rash on skin or discoloration of fingers or toes.

Co-morbidity is defined as the presence of one or more additional conditions co-occurring with a primary condition. The co-morbidity was first introduced by Feinstein in 1970 to denote those cases in which a 'distinct additional clinical entity' occurred during the clinical course of a patient having an index disease. As the WHO has stated that Older people, and those with underlying medical problems

like high blood pressure, heart and lung problems, diabetes, or cancer, that means having existing co-morbidity are at higher risk of developing serious illness and hence these co-morbidities have been proved to be the risk factors for contraction of the disease.

India is the diabetes capital of the world with 41 million Indians having diabetes; every fifth diabetic in the world is an Indian. It also leads in prevalence of metabolic syndrome as well as obesity.20 million Indians are either obese or abdominally obese with children being the prime targets and by 2025; the expected number is 68 million. But there is impact of obesity and diabetes is through cardiovascular disease and hypertension. The epidemiology of hypertension in terms both of its importance as a risk factor for cardiovascular and other diseases and of its own etiology, continues to be a major field of investigation with an enormous peer-reviewed literature each [11].

The state of Maharashtra has an estimated 6 million diabetes cases, 70% of which are undiagnosed [12]. The overall prevalence of hypertension is 25% in Maharashtra [13]. The prevalence of generalized obesity was found to be around 16.6%, that of the abdominal obesity is 18.7% and thus the prevalence of Combined Obesity is 13.0% [14].

India witnessed the largest containment experiment in history, when - on 25 March - its 1.3 billion citizens battened down their hatches in an attempt to flatten the COVID-19 curve. The lockdown may now be ending but - as is happening across the globe - a new epidemic is now emerging. According to a survey conducted by the Indian Psychiatry Society, within a week of the start of the lockdown, the number of reported cases of mental illness in India had risen by 20%.[15]

Previous similar studies performed on population of India and China confirmed the psychological distress amongst the people due to lockdown conditions in the country. Psychological symptoms thus observed included anxiety, depression and anger attacks. [16, 17, 18]

The prime aim of this research was to investigate the same in the Indian state of Maharashtra which has greatest number of positive cases till date diagnosed with Covid19 and also recorded deaths due to presence of comorbidities, thus increasing vulnerability of this population with respect to psychological distress.

Taking above points in consideration, this research was conducted in the Indian state of Maharashtra in which, approximately 300 participants participated in this research survey out of which 60 people for each normal and comorbid population groups were selected randomly for the ease of comparison of results.

Adult population with age ranging within 20 to 65 years participated, maximum were matriculated as per the educational qualification thus stating the literacy about understanding and answering health related questionnaires. The responses were recorded from entire geographical zones of Maharashtra, covering most of the districts with varied levels of affection of the pandemic in the state. Fairly equal number of responses in terms of gender is obtained eliminating the gender bias. Maximum participants confirmed moderate to complete knowledge about the disease by answering the dedicated section of questionnaire.

Section including questions about anxiety which were designed in reference to Hamilton Clinical scale and with some self designed questions taking in account the state population recorded more anxiety in the Co-morbid population as compared to the normal population, signifying greater psychological impact of both the lockdown and the pandemic on them. Obsession of taking bath and washing hands, feeling nervousness without any good reason, worrying about prevalent health condition was observed in Co-morbid population. More so, fear of touching objects exposed to multiple contacts was also recorded. Symptoms of excessive thirst due to

breathlessness or nervousness peaked in them. [Anxiety_results]

Anxiety Results: -
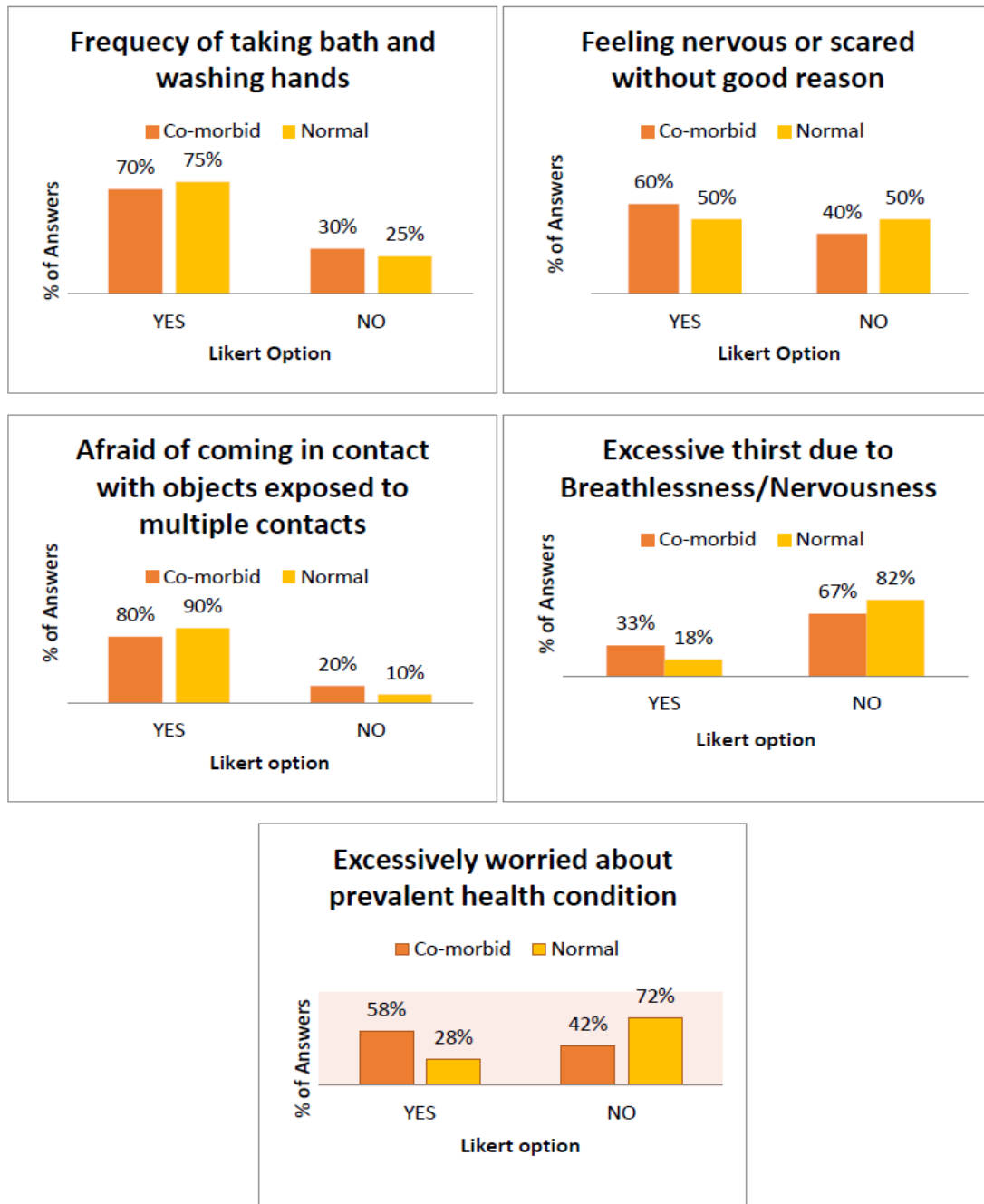
Depression being prevalent in the state and the country observed a surge in the period of lockdown. Though reporting similar impact on both the co-morbid and normal population, rise in the incidence of depression was noted in co-morbid population. Increases in inactive time by spending more time in the bed, negative thoughts, and frequent breakdowns were highly positive in co-morbid population unlike normal population. Lack of sympathy and understanding towards them was also reported through the dedicated question. The question about the possibility of getting out of this situation recorded a negative reply by this population. [Depression_results]

Depression Results: -
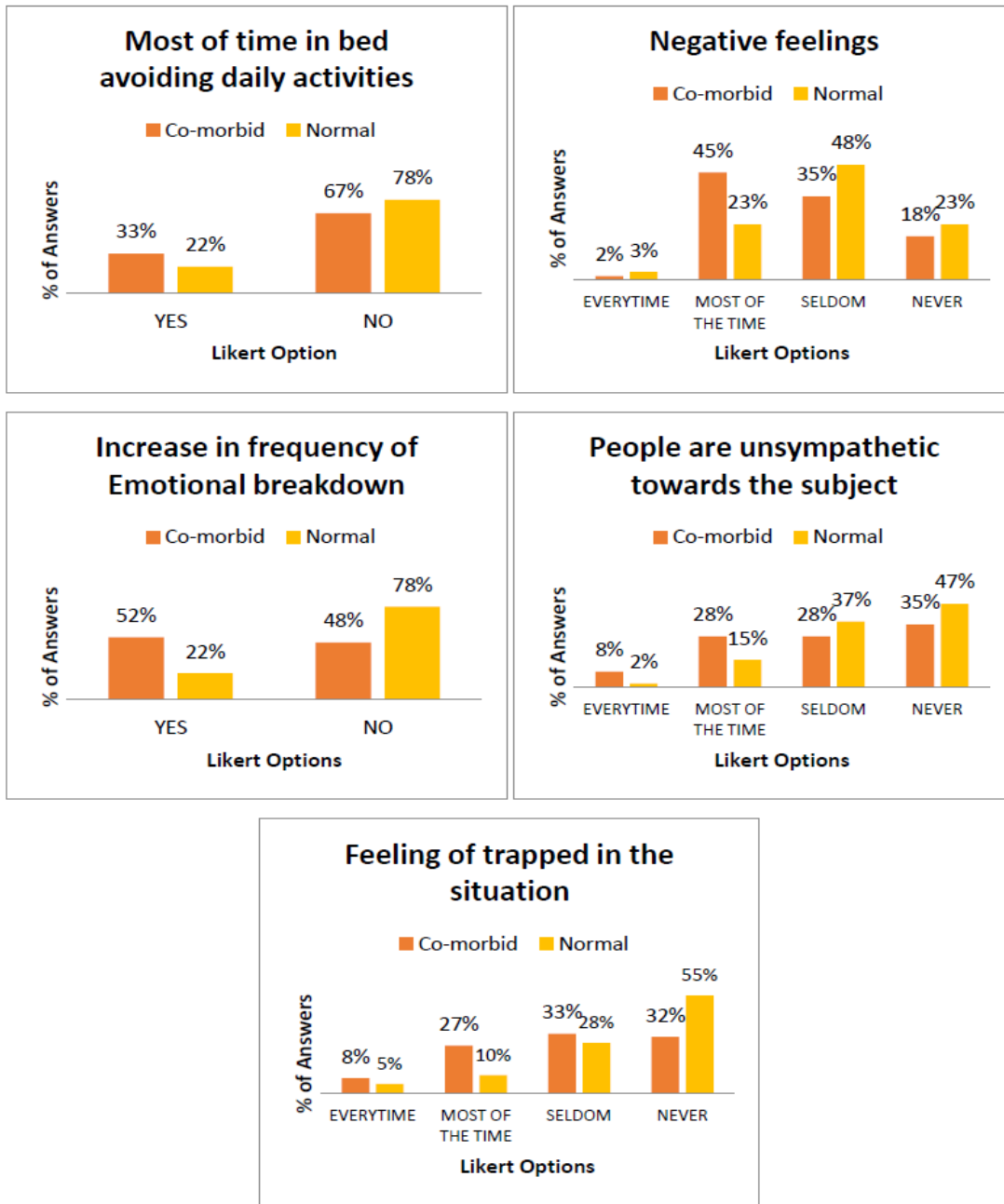
Anger being a spontaneous response represents irritability leading to frustration and anger spells. Normal case scenario might not evoke anger response, but due to high irritability due to the associated health conditions in lockdown, co-morbid population reported a spike in anger episodes. Losing control over behavior, thoughts and emotions, anger spells in regards to prevalent health condition, unnecessary shouting and irrational conduct, thus shows an increase in co-morbid population. High guilt about past lifestyle and blaming external conditions for damaging self was also reported more by co-morbid population than normal population. [Anger_results]

Anger Results: –
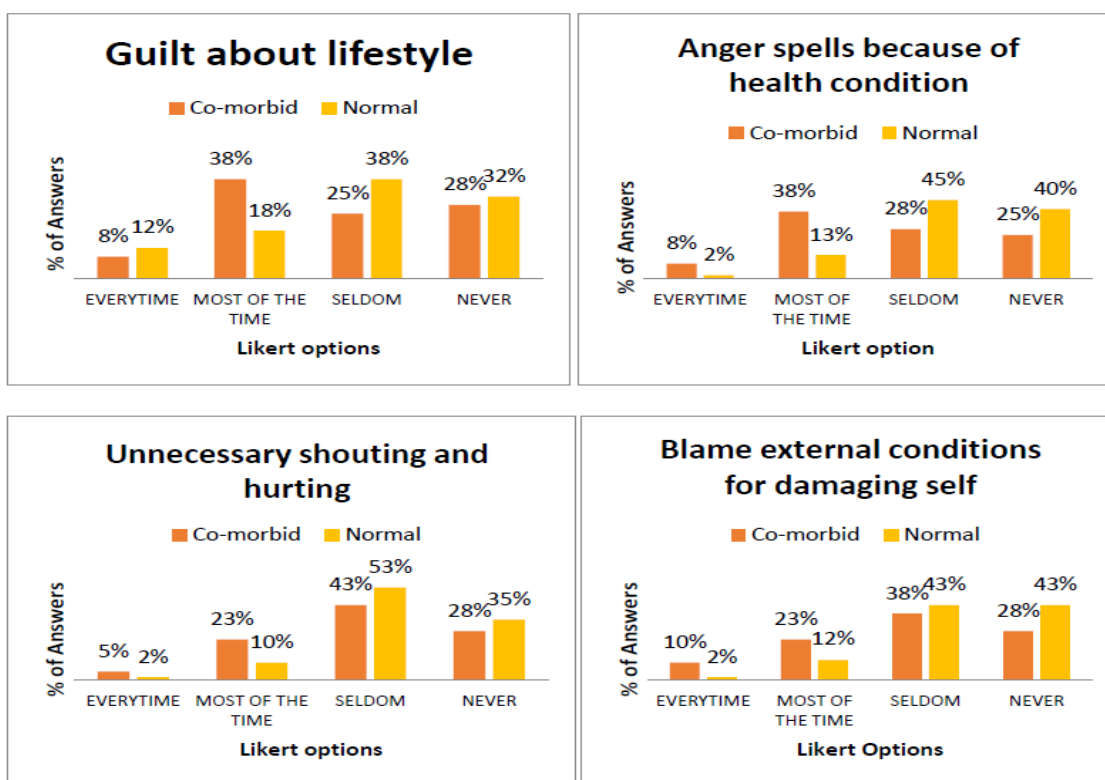
Sleep and Appetite: –
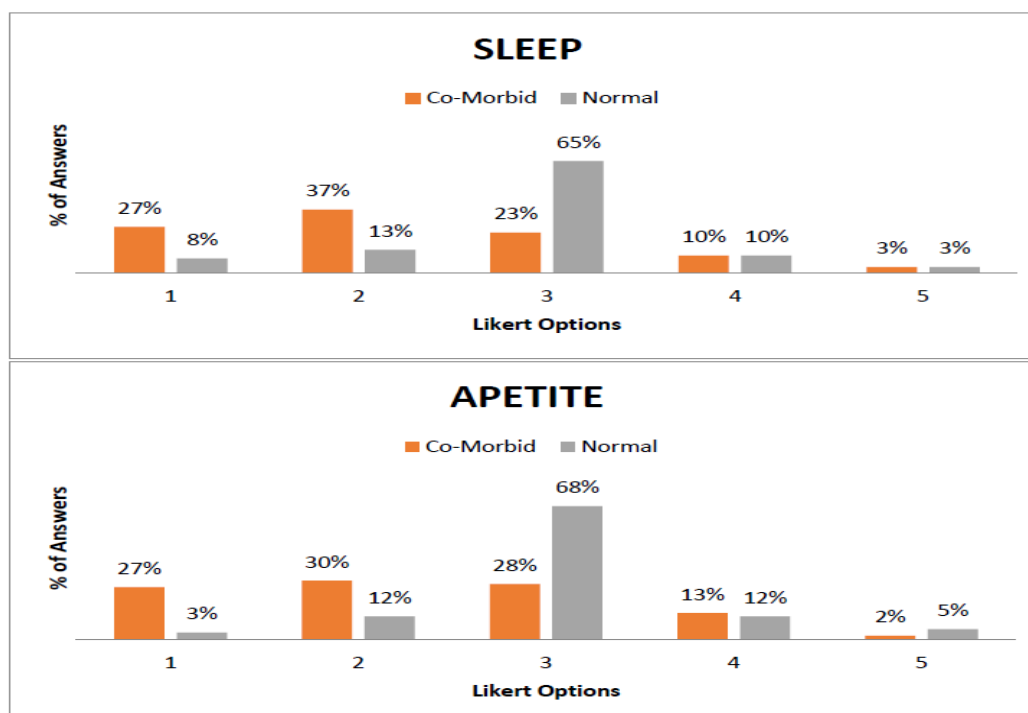
Disturbed sleep-wake cycle was reported in co-morbid population. 64% reported decrease in sleep in co-morbid population whereas 21% reported decrease in sleep in Normal population. Normal sleep-wake cycle was observed in 23% in co-morbid and 68% in normal population. 13% for both reported increase in sleep.

After taking an overview of this sleep pattern in both the population, decreased sleep was confirmed by co-morbid population signifying increase psychological affect as both depression and anxiety can cause alterations in sleep patterns. [Sleep_and_Apetite]

Similar to the sleep patterns change in appetite was significantly noted in co-morbid population as 57% reported decreased in appetite, 15% reported increase in appetite and 28% had unchanged appetite out of total of the co-morbid population whereas normal population 68% had their appetite unchanged, 17% showed increase

and 15% showed decreased in the appetite amongst the normal. The above data shows appetite disturbances predominant in co-morbid population which can be secondary to psychological affection. Symptoms like fatigue, chest pain, faintness, headache and sweating were also recorded by the investigators as they are commonly seen and associated with psychological distress. High prevalence of the above symptoms was confirmed in co-morbid population with fatigue and headache being the highest recorded in the co-morbid population as compared to normal.[Physical_parameters]

Physical Parameters: -
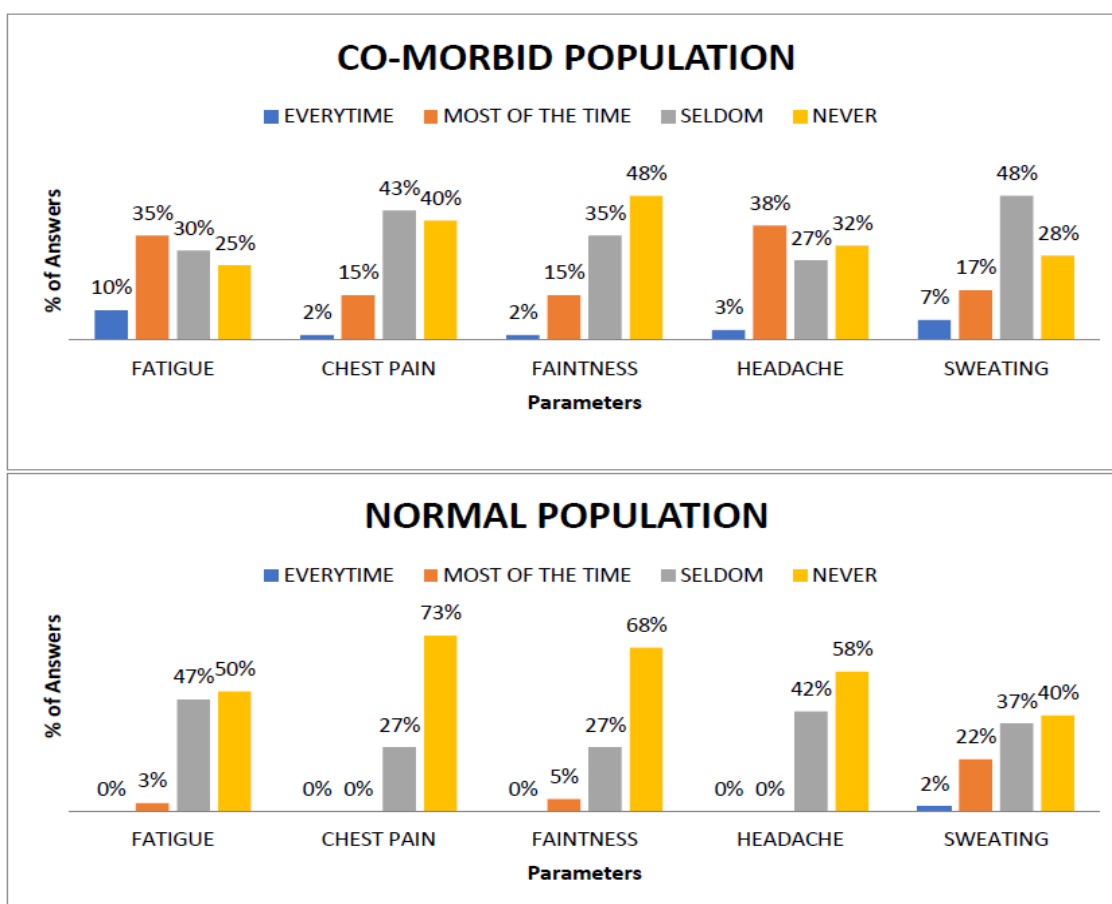
When the total scores of all of the above sections for each subject were analyzed using statistical methods like Welsch t-test and 2 way ANOVA test we found that there is statistical significance between the two groups that is Co-morbid and Normal population at $P<0.05$ which

signifies that the probability of chance occurrence is less than 5 percent. This clearly signifies that there is a correlation between the psychological factors and presence of co-morbidity in the population of Maharashtra and the co-morbid population is adversely affected by the

lockdown situations and ever-changing scenario of the Indian state of Maharashtra.

CONCLUSION

Though an unprecedented situation, lockdown has certainly taken a toll on the mental health of the entire population of Maharashtra. With such jarring and rapid shifts in lifestyles and routines, it may come as no surprise that psychological whiplash would follow.

But the fact that special attention has to be given to a physically as well as psychologically vulnerable group of population that is co-morbid Population cannot be furthermore neglected. In accordance with the data analysis done by the investigators, the rate and intensity of psychological affection is very high in this population and has to be attended with special consideration.

Perhaps equally invisible and no less insidious mental health issues amidst the lockdown situations can give rise to another upcoming pandemic post this pandemic and hence should be addressed urgently.

This research therefore proves to be a unique assessment throwing light upon the requirements of the highly vulnerable co-morbid population as the associated co-morbidities increase the risk of psychological distress thus showing high correlation amongst the two.

SUGGESTION:-

- To reduce ambiguity and/or panic, information sharing with the help of videos and readable material in lay man's language, through websites can be implemented. Eg. Indian Government controlled COVID 19 website.
- Also to reduce spread of false news and myths, authenticated updates about the current condition of the state and the country can be displayed on various social platforms.
- Helpline numbers providing an immediate response in emergency situations can be launched.

- Education and awareness about the psychological impact and reactions to trauma while differentiating between normal and abnormal reaction should be provided.
- Where to seek help should be clearly defined with special consideration to comorbid population as the research proves that having the highest risk to develop mental illness, this population might need specialized help to deal with associated health problems.
- Counseling and behavioral therapies can be used as an effective tool to reduce the incidence and thus reduce the distress in the population.
- Training programs, professional tips and suggestions for controlling mental illness as well as comorbidities should be launched to help the population facilitating their active participation.
- People amongst the common public who have overcome similar problems should be provided with a platform to share their experiences, solutions, and views about the same, setting a live example for those who are suffering thus motivating them even in the adversities.
- Transparent policy planning by the government to reduce confusion by forming unique communication mediums enabling people's participation should be encouraged.

ACKNOWLEDGEMENT

Conflicts Of Interest: - None

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APPENDIX (Questionnaire)

SR NO.	QUESTION	TYPE OF QUESTION
	ANXIETY SECTION	
1	Do you feel excessive thirst due to breathlessness and/or nervousness?	YES/NO QUESTION
2	Are you excessively worried about your prevalent health condition?	YES/NO QUESTION
3	Are you afraid of touching or coming in contact with objects which are already exposed to multiple contacts?	YES/NO QUESTION
4	Do you feel nervous or scared because of the news about COVID-19 on TV or Social media?	YES/NO QUESTION
5	Has your frequency and duration of washing hands or taking bath increase unusually?	YES/NO QUESTION
	DEPRESSION SECTION	
1	Do you spend most of the time in bed avoiding most of the daily activities?	YES/NO QUESTION
2	How many times in a day you feel negative about yourself or about current situation in the world?	LIKERT SCALE (4 POINT)
3	Have you perceived any increase in the frequency of emotional breakdown in past 1 month?	YES/NO QUESTION
4	How often do you feel that people do not understand your suffering and are unsympathetic towards you?	LIKERT SCALE (4 POINT)
5	How often do you think that getting out of the current situation is impossible?	LIKERT SCALE (4 POINT)
	ANGER SECTION	
1	Have you been in firm control of your behavior, thoughts, emotions and feelings in past one month?	YES/NO QUESTION
2	How often do you get anger spells because your overall health condition has been bothering you in past one month?	LIKERT SCALE (4 POINT)
3	How often do you resort to unnecessary shouting, hurting or irrational conduct?	LIKERT SCALE (4 POINT)
4	How often do you feel guilty about your lifestyle affecting your practical and mental health?	LIKERT SCALE (4 POINT)
5	How often do you blame external conditions for damaging self? (health or property)	LIKERT SCALE (4 POINT)
	PHYSICAL PROPERTIES SECTION	
1	Fatigue	
2	Chest pain	
3	Faintness	LIKERT SCALE (5 POINTS)
4	Headache	
5	Sweating	

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