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# EFFECT OF COVID-19 PANDEMIC LOCKDOWN ON MENTAL HEALTH AND ITS CORRELATION WITH PHYSICAL HEALTH AMONG HEALTHY WORKING ADULTS: A QUANTITATIVE STUDY

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## Abstract

COVID-19 pandemic lockdown caused sudden and drastic alteration in the daily routine, which resulted in a psychological burden for the general population. So the study aimed to study the effect of lockdown on mental health and its correlation with physical health among healthy working adults. This quantitative, cross-sectional study was conducted in Kanyakumari District, Tamil Nadu, the southernmost state of India. A convenient sample of 590 healthy working adults was participated and completed a self-administered questionnaire. A paired t-test was used to compare the mean score of physical and mental health. Pearson correlation test was used to determine the correlation between physical symptoms and mental health. Descriptive statistics were used to describe the frequencies of variables. A significant P value was set at 0.05 at 95% confidence interval. The results showed that more than half (56.6%) of participants were reported that they had good physical health, on the other side more than half (55.1%) of participants reported that they had an average level of mental health during the lockdown due to COVID-19 pandemic. The physical symptoms like headache, sleeping pattern, gas trouble, indigestion, and palpitation were had a correlation with mental health. In conclusion, the Covid-19 pandemic had a significant effect on the physical and mental health of the working adult population. Particularly, it affected the mental health of people which eventually had various noticeable effects on physical health also.

**Keywords:** COVID-19, Pandemic, Lockdown, Physical health, Mental health, Correlation

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## 1. Introduction

In recent years, the world has witnessed a number of epidemic outbreaks with devastating effects. While outbreaks are inevitable, their impact can be mitigated (Southall et al., 2017). The COVID-19 pandemic is a worldwide pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome Coronavirus 2 (SARS-CoV-2) and it was first detected in Wuhan City, Hubei Province of China (WHO, 2020).

The first confirmed case of corona virus in India was reported on 30th January, 2020 in the southern state of Kerala. The patient, a female student at Wuhan University in China, tested positive for the novel corona virus after returning to Kerala (Sanaya, 2020). On 24 March 2020, the Government of India under Prime Minister Narendra Modi ordered a nationwide lockdown for 21 days, limiting movement of the entire 1.3 billion population of India as a preventive measure against the COVID-19 pandemic in India (Gettleman, et al., 2020). The prolonged lockdown caused sudden and drastic alteration in the daily routine, with many millions stranded in boarding houses and rental apartments, without work and far from home. The impact of the lockdown is likely to be heaviest on those who are alone, poor, already psychologically burdened, or out of the mainstream at baseline (Liji, 2020).

Study reports were affirmed that mental health and physical health are fundamentally connected (Julius, 2017, Morgan V A, 2014, Lawrence D and Coghlan R, 2002). People living with a serious mental illness are at higher risk of experiencing a wide range of chronic physical conditions (Lawrence and Coghlan, 2002). The perceived disconnect between “mind” and “body” creates the misconception that mental illness is not a physical disease. In reality, mental health has a direct impact on physical health (CMAH, 2008).

If the current situation continues, there is no doubt that in the next few years, people will suffer from stress, depression due to unemployment and poverty. It might lead to other stress-induced physical symptoms. Everyone around the world is hoping that this will not last long, and in a few years economic crisis will be solved around the world. So to identify the impact of COVID-19, the researchers took interest to study the effect of lockdown on mental health and its correlation with physical health among healthy working adults.

## 2. Material and Method

This was a quantitative, cross sectional study to assess the mental health and its correlation with physical health among healthy adults from Kanyakumari District, Tamil Nadu, the southernmost state of India. There are 590 healthy working adults were participated in the survey. The data were collected by using convenient sampling technique. The inclusion criteria were the participants who are healthy and interested to participate in the survey, aged between 21-60years without any medical or psychological illness. The participants were instructed that their involvement in the study wasn't mandatory. They were additionally told that they can clarify their doubts while filling the questionnaire. The researcher also reassured the subjects that their privacy will be protected, and any obtained information will be kept strictly confidential. They had filled the survey in about 15 to 20 minutes. Data collection was done for a period of about 1 ½ months. (May 2020- June 2020).

### 2.1. Tool for Data Collection

A self-administered questionnaire was designed by the researcher based on review of pertinent literatures. The tool contains 3 sections including baseline information, assessment of physical health and assessment of mental health. Baseline information: it includes five items, which provides basic information about the participants along with 2 more questions about quarantined for Corona virus and tested positive for COVID-19.

The tool for assessing physical health contains 10 statements and each statement with four options like Never, Rarely sometimes and always. The total score ranges from 0-30. Total scores were classified as follows: 0-25% poor, Average 26%-50%, Good 51%-75%, Excellent -76%-100%. The higher score indicates good physical health. Reliability of self-structured questionnaire was verified using Reliability statistics cronbach's Alpha. The reliability was 0.86 and the questionnaire was found to be reliable.

The tool for assessing mental health also contains 10 statements and each statement with four options like Never, Rarely sometimes and always. The total score ranges from 0-30. Total scores were classified from poor to excellent. The higher score indicates good mental health. Reliability of self-structured questionnaire was verified using Reliability statistics cronbach's Alpha. The reliability was 0.89 and the questionnaire was found to be reliable.

### 2.2. Statistical Analysis

For data analysis, the statistical software SPSS (Statistical Package for Social Sciences) version 16.0 was used, facilitating the process of organizing data into tables for the sake of better visualization of the results and their interpretation. Paired t test was used to compare the mean score of physical and mental health. Pearson correlation test was used to determine the correlation between physical symptoms and mental health. Descriptive statistics were used to describe frequencies of variables. A significant P value was set at 0.05 at 95% confidence interval.

### 2.3. Ethical Consideration

Participants were informed about the purpose of the study, and written informed consent was obtained. Participants were assured that they can withdraw themselves from the study at any time, findings would not be linked to individuals, and that all study events and materials would maintain confidentiality. Participants were not considered to be at risk of harm. They were informed that the duration would be approximately 15-20 minutes.

## 3. Results

590 working healthy adults were participated in the study (Table1). Majority of study participants (32.9%) were belongs to 41-50 years of age. More than half (56.6%) of participants were females. Most of the participants (52.2%) were undergraduates. The majority (52.9%) of participants were the private employees.

**Table 1**. Demographic variables

| Sl. No | Variables | Frequency N=590 | % |
|---|---|---|---|
| 1 | Age | | |
| | 21-30 years | 62 | 10.5 |
| | 31-40 years | 189 | 32.0 |
| | 41-50 years | 194 | 32.9 |
| | 51-60 years | 145 | 24.6 |
| 2 | Gender | | |
| | Male | 256 | 43.4 |
| | Female | 334 | 56.6 |
| 3 | Education | | |
| | School education | 80 | 13.6 |
| | Undergraduate | 308 | 52.2 |
| | Post Graduate and above | 202 | 34.2 |
| 4 | Occupation | | |
| | Government employee | 29 | 4.9 |
| | Private | 312 | 52.9 |
| | Own business | 183 | 31 |
| | Abroad | 43 | 7.3 |
| | others | 23 | 3.9 |
| 5 | Monthly Income | | |
| | < Rs.10,000/- | 82 | 13.9 |
| | Rs. 10,001- 20,000/- | 164 | 27.8 |
| | Rs. 20,001- 30,000/- | 149 | 25.3 |
| | Rs. 30,001- 40,000/- | 105 | 17.8 |
| | >Rs. 40,000/- | 90 | 15.3 |
| 4 | Religion | | |
| | Hindu | 203 | 34.4 |
| | Christian | 332 | 56.3 |
| | Muslim | 55 | 9.3 |
| 5 | Marital status | | |
| | Married | 502 | 85.1 |
| | Unmarried | 88 | 14.9 |

The comparison of overall physical and mental health was illustrated in Figure 1. It showed that more than half (56.6%) of participants were reported that they had good physical health, on the other side more than half (55.1%) of participants reported that they had average level of mental health during the lockdown due to COVID-19 pandemic. But the less reported aspect was only 2.5% had poor physical health and 8.10 % had excellent mental health.

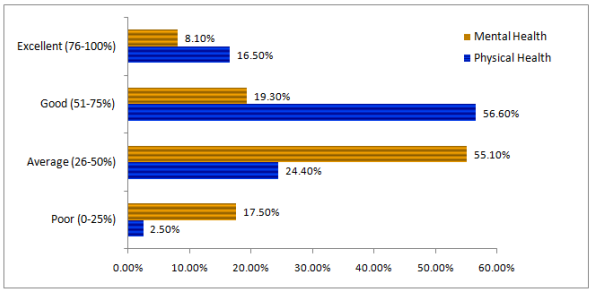


**Figure 1.** Comparison of overall Physical and Mental health among working adults during COCD-19 pandemic Lockdown.

Comparison of Mean differences between physical and mental health among working adults was depicted in Table 2. It represented the mean score of Physical health was 18.35, which was higher than the mean score of mental health (13.81). Significant difference was calculated by using paired t test and it proved that, there was a statistically significant difference (t=22.221) between physical and mental health at p<0.01 level. It indicated that the participant's physical health was better than the mental health during the lockdown due to corona pandemic.

Pearson correlation test confirmed that there was a positive correlation between the physical and mental health of working adults during Corona pandemic Lockdown. It was presented in Table 3. Thus the study result confirmed that, when the mental health improves, precisely it will increase the physical health also.

Correlation of mental health score with physical symptoms was presented in Table 4. The maximum score for each variable was set to be 3. The pearson correlation test showed that head ache had positive correlation (r=0.916, p<0.000) with mental health, as it indicates that, as the mental health becomes good the participant may feels relieves in head ache. During lockdown the participants were reported that they had sleeping disturbance or inability to fall asleep at night. This aspect also had positive correlation with mental health (r=0.892, p=0.000<0.05), which means when the mental health improves obviously it will improve the sleep pattern. Gas trouble or acidity (r=0.738, p=0.002<0.05), indigestion or heartburn (r=0.740, p=0.012<0.05) and palpitation (r=0.609, p=0.000<0.05) also had positive correlation with mental health. But the other symptoms Constipation or Diarrhea (r=0.0.007, p=0.065>0.05), Dizziness or fainting (r=0.025, p=0.056>0.05), over eating or obesity (r=0.0.056, p=0.178>0.05), Body pain (r=0.0.042, p=0.409>0.05) and tiredness or fatigue (r=0.035 p=0.392>0.05) were had no correlation with the mental health of participants.

The comparison of mean, standard deviation according to age was given in Table 5. The overall mean score of physical health (18.35) was more than mental health (13.81). The physical health was good (19.34) for the age group of 20-30 years than other age groups. But mental

health mean score (15.61) was good at 41-50 years. Whereas mean score of physical health was less at 51-60 years and mental health was less (11.0) at 51-60 years.

The comparison of mean, standard deviation according to gender was given in Table 6. It showed that physical health of male participants (18.51) was more than the female (18.23) participants. The same were reported in mental health also. But the findings were not had much variations between male and female participants. It ought to be noted that both the gender had good score in physical health only.

**Table 2.** Comparison of Mean differences between physical and mental health among working adults during Corona pandemic Lockdown

| Variables | Maximum score | Mean | SD± SEM | t value | P value |
|---|---|---|---|---|---|
| Physical health | 30 | 18.35 | 4.997±0.206 | 22.221 | 0.000* |
| Mental health | 30 | 13.81 | 5.493± 0.226 | | |

**Table 3.** Correlation between physical and mental health among working adults during Corona pandemic Lockdown

| Variables | Maximum score | Mean | SD± SEM | r value | P value |
|---|---|---|---|---|---|
| Physical health | 30 | 18.35 | 4.997±0.206 | 0.554 | 0.000* |
| Mental health | 30 | 13.81 | 5.493± 0.226 | | |

**Table 4.** Correlation of mental health score with physical symptoms among working adults during Corona pandemic Lockdown

| Physical symptoms | Mean value | SD±SEM | Correlation value | P value |
|---|---|---|---|---|
| Head ache | 1.53 | 0.933±0.038 | 0.916 | 0.000* |
| Sleeping disturbance | 1.52 | 1.066±0.442 | 0.892 | 0.000* |
| Constipation or Diarrhea | 1.65 | 0.673±0.28 | 0.007 | 0.065 |
| Gas trouble or acidity | 1.52 | 1.066±0.44 | 0.738 | 0.002* |
| Dizziness or fainting | 2.04 | 0.962± 0.31 | 0.025 | 0.056 |
| Over eating/obesity | 2.07 | 0.845±0.089 | 0.056 | 0.178 |
| Body pain/ back ache | 2.08 | 0.796±0.561 | 0.042 | 0.409 |
| Tiredness or Fatigue | 2.2 | 1.23±0.765 | 0.035 | 0.392 |
| Indigestion or Heartburn | 2.12 | 1.105±0.543 | 0.740 | 0.012* |
| Palpitations | 1.62 | 1.032±0.021 | 0.609 | 0.000* |

Maximum score for each variable= 3 , *statistically significant at 0.05 level

Table 5. Mean Standard Deviation (SD) and Standard Error Mean (SEM) of physical and mental health according to age

| Age in years | Physical Health | | Mental health | |
|---|---|---|---|---|
| | Mean | SD ±SEM | Mean | SD ± SEM |
| 20-30 years | 19.34 | 4.292 ± 0.545 | 13.82 | 4.233±0.538 |
| 31-40 years | 18.10 | 4.157±0.302 | 14.10 | 4.656±0.339 |
| 41-50 years | 18.25 | 6.158±0.442 | 15.61 | 5.493±0.394 |
| 51-60 years | 18.33 | 4.524±0.376 | 11.0 | 5.883±0.489 |
| Total | 18.35 | 4.997±0.206 | 13.81 | 5.492±0.226 |

**Table 6.** Mean Standard Deviation (SD) and Standard Error Mean (SEM) score of physical and mental health according to gender

| Gender | Physical Health | | Mental health | |
|---|---|---|---|---|
| | Mean | SD ±SEM | Mean | SD ± SEM |
| Male | 18.51 | 4.124 ± 0.258 | 14.13 | 5.338±0.334 |
| Female | 18.23 | 5.578±0.305 | 13.56 | 5.604±0.307 |
| Total | 18.35 | 4.997±0.206 | 13.81 | 5.492±0.226 |

The comparison of mean, standard deviation according to monthly income was given in Table 7. It showed that participants had >Rs.40,000/- of monthly income had good (20.17) physical health and good mental health(17.63), whereas who had less than Rs.10,000 were reported less physical health(17.77) and their mental health score was also less (11.71). When comparing both aspects the mean score of physical health was reported well than the mental health in all income groups of participants.

**Table 7**. Mean, Standard Deviation (SD) and Standard Error Mean (SEM) score of physical and mental health according to monthly income

| Monthly income | Physical Health | | Mental health | |
|---|---|---|---|---|
| | Mean | SD ±SEM | Mean | SD ± SEM |
| <Rs.10,000 | 17.77 | 3.917±0.433 | 11.71 | 3.936±0.435 |
| Rs.10,001-Rs.20,000 | 18.34 | 4.485±0.350 | 11.65 | 5.795±0.452 |
| Rs.20,001-Rs.30,000 | 17.90 | 3.943±0.323 | 14.44 | 3.975±0.326 |
| Rs.30,001-Rs.40,000 | 17.91 | 4.301±0.420 | 13.85 | 4.307±0.420 |
| >Rs.40,000 | 20.17 | 7.923±0.835 | 17.63 | 7.133±0.752 |
| Total | 18.35 | 4.997±0.206 | 13.81 | 5.492±0.226 |

Mean score of physical and mental health of participants quarantined for the symptoms of corona virus and tested Positive for COVID-19 was illustrated in Figure 2. It stated that the mean score of mental health and physical health was less for the participants whoever was quarantined and tested positive for corona virus.

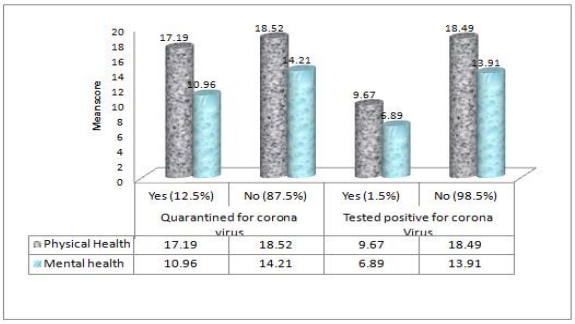


**Figure 2**. Comparison between Mean score of physical and mental health of participants quarantined for the symptoms of corona virus and tested Positive for COVID-19.

## 4. Discussion

The present study was aimed to assess the effect of lockdown during COVID-19 pandemic on mental health and its effect of physical health among healthy working adults. This study proved that, the mental health was highly affected by the COVID-19 pandemic lockdown than physical health. People with poor mental health had reported majority of physical symptoms also (Anne, 2019). A study conducted in China during the initial state of COVID-19 outbreak stated that more than half of the respondents rated their psychological impact as moderate-to-severe, and about one-third reported moderate-to-severe anxiety (Cuiyan et al., 2020). Various studies have shown that psychological troubles can cause functional and structural changes in the hippocampus section of the brain and changes in hormone levels in human body (McEwen, 1999; McEwen, 1995; Mendl, 1999). Similar other studies demonstrated that psychological stress is associated with increases in blood pressure and the development of hypertension (Guimont et al., 2006; Tobe et al., 2007).

This study has confirmed that stress has a negative influence on headache. We found that almost majority of participants reported that they had head ache during lockdown period. De Benedictis and Lorenzetti (1992) studied patients with recurrent headache for 16 days per month and found that those with chronic tension were more exposed to stressful events. Another study also suggested that patients with transformed headache are characterized by a different way of psychological disturbances (Domenico et al., 2000).

The present study also had a strong correlation of mental health and sleeping pattern. A survey from London reported that, the lockdown is having a considerable effect on workers' sleeping habits. Almost two-thirds (63%) of people reported that the quality of sleep has deteriorated since March 2020 (Ashleigh, 2020). Dr. MS Kanwar, who is the Director of Advanced Sleep Disorder Institute, New Delhi said that "Ever since the lockdown, getting a lot of phone calls about irregular sleep. This is not only from the people who already have sleep disorders, but also from those who have other health related issues" (Sweta, 2020).

The study results confirmed that the participants had gas troubles and indigestion during the period of COVID-19 pandemic lockdown. A study report proved that negative emotion may cause gastro intestinal tract disturbances including gastric secretion, gut motility, mucosal permeability, mucosal barrier function, visceral sensitivity and mucosal blood flow (Huerta et al., 2012; Konturek et al., 2011; Bhatia, 2005). Another study reported that depression and anxiety are related to different digestive tract related diseases (Sang P et al., 2015). Our study also showed that palpitation had correlation with mental health. It was supported by a study proved that negative emotion has an asymmetric effect on cortical activity resulting in increase in heart beat (Burg et al., 1993).

## 5. Limitations

Certain limitations of the study should not be left unmentioned. It was not a randomized sample. Since participation was voluntary, the data was completed by self-reporting. This means that the accuracy of the responses could be compromised and the researchers are unable to verify the validity. There was a lack of time to extend the study as it is needed to be. The study was restricted to the location only in a southern most district of India. Finally, this study utilized a convenience sample. Additional research is thus needed to examine the

generalizability of the findings.

## 6. Recommendations

A similar study can be replicated on a larger sample to help validate and generalize the findings to the entire population of the country. Another study can be done in the study settings after a couple of months or years so as to analyze changes after the normalcy of life. A comparative study can be conducted with other states or with other country populations.

## 7. Conclusion

In conclusion Covid-19 pandemic had significant effect on physical and mental health of people. In particular it affected the mental health of people which eventually had various noticeable effects on physical health also. So the present data proved that physical and mental health are unique and independent effects on each other.

**Conflict of interest**

The authors declare that there is no conflict of interest.

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