Mental health, sleep quality and quality of life in individuals with and without multiple health conditions during home quarantine in India due to the COVID-19 pandemic: a cross-sectional study [version 2; peer review: 1 approved, 1 not approved]

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Background: Since the World Health Organization (WHO) declared the COVID-19 outbreak a global pandemic and the global spread had created several challenges for the general public and the healthcare workers across the world, the primary aim of this study was to assess the psychological stress, sleep quality, and health-related quality of life (QoL) of individuals with multiple health issues during home quarantine caused by the COVID-19 pandemic.

Methods: The study was conducted between 28th March to 30th April 2020. We recruited 50 individuals who have a history of chronic health issues, and 50 individuals with no health issues for this cross-sectional study. Three questionnaires were used to evaluate the mental health [depression anxiety stress scale (DASS-21)], sleep quality [Pittsburgh sleep quality index (PSQI)], and QoL [short form of health-related questionnaire (SF-36)] of the participants. Statistical analysis was carried out with Student’s t-test, using SPSS software v16.

Results: Baseline demographic characteristics were homogenous for both groups of participants. Intergroup analysis revealed statistically significant differences in mental health (p<0.001), sleep quality (p<0.001), and QoL (p<0.001) between the two groups. The results showed high levels of depression, anxiety and stress; poor sleep quality and low health-related QoL in Group A as compared to Group B.

Conclusion: Our findings indicate that individuals with chronic health issues exhibit higher mental health problems, lower quality of sleep and have a lower health-related QoL. More research is required and also government should plan on taking care of those patients.
Introduction

According to the World Health Organization (WHO), the COVID-19 outbreak is a global pandemic that started at the end of November in China and then gradually spread all over the world. As neither treatment nor vaccine has been discovered for this disease, it raises concerns among the public about the spread of infection from confirmed COVID-19 positive cases. The WHO suggests that social isolation helps to limit the growing number of cases of COVID-19, and this has also led to significant fear and anxiety related to the spread of infection in the general public. Excessive fear and apprehension about the spread of infection can lead to acute stress, anxiety, and low quality of sleep. Many organizations are already working to increase awareness about the societal impact of the ongoing pandemic. For instance, it has been reported that during this pandemic crisis, various factors that impact the health of individuals, such as prolonged periods of social isolation, fear of unemployment, and economic loss, have the potential to increase due to lockdown.

The relationship between physical illness and mental health has received increased attention in recent years, and poor mental health is of concern as it may negatively affect an individual’s quality of life (QoL). Evidence suggests a direct relationship between mental health and sleep quality, a crucial public health issue. This study aimed to assess the psychological stress, sleep quality, and health-related QoL of individuals with and without multiple health issues during home quarantine in India due to the COVID-19 pandemic.

Methods

Ethical considerations

The study followed all guidelines for ethical conduct per the World Medical Association’s Declaration of Helsinki (2013) and the Good Clinical Practice (Indian Council of Medical Research).

We obtained approval for the study from the Institutional Research Ethics Committee of the Lovely Professional University (LPU), Phagwara, India (LPU/IEC/2020/26/03). All the participants were informed about the data collection procedure, and a written consent form was obtained from all the participants before the study started.

Study design and setting

This study was an observational cross-sectional study. The study took place at the Department of Physiotherapy, LPU. The study was conducted from 28th March to 30th April 2020. Full lockdown in India was initiated from 28th March to 31st May 2020. From 31st May, the lockdown was extended until 30th June for certain containment zones.

Participant recruitment

A total of 100 participants were recruited for the study as per their medical history. A total of 50 individuals suffering from chronic health issues (Group A; as identified from their clinical records) and 50 individuals with no chronic health issues (Group B) were recruited.

Sample size calculation

Sample size was calculated using G power software 3.1. The estimated sample size calculated for the study was 51 (95% confidence interval, power of the study was 80% where the effect size was considered as 0.5).

Individuals undergoing physio treatment at the Department of Physiotherapy, LPU (even though lockdown was going on, essential services, such as physio appointments, were continuing) were recruited for the study.

Individuals were contacted via phone to ask if they would like to take part in the study. As they were supposed to take physiotherapy services from our Organization, so before starting the treatment session, they were requested to sign the consent form, fill the questionnaire and were informed about the study procedure.

Group A inclusion criteria: Individuals clinically pre-diagnosed with hypertension, diabetics, and chronic musculoskeletal conditions were included in this group.

Group B inclusion criteria: Individuals with no chronic health issues were included in this group.

Groups A and B exclusion criteria: Individuals with history of any malignancy, recent fracture or trauma, osteoporosis, inflammatory arthritis, and/or cauda equine syndrome were excluded from this study.

Outcome measures

Mental health. Depression, anxiety, and stress scale (DASS-21) was used to assess depression, anxiety, and stress. The participants were asked to utilize a four-point severity/frequency scale to show the level of depression, anxiety, and stress they were experiencing in the past week.
**Sleep quality.** Sleep quality was evaluated through the Pittsburgh Sleep Quality Index (PSQI)\(^1\). This index asked participants to answer questions about their sleep habits in the past month. Participants that scored more than 5 were defined as having a low sleep quality.

**Quality of life.** Health-related QoL was assessed using the MOS 36-item short-form health survey (SF-36)\(^2\). The 36 items reflect eight health-related aspects that participants are asked to score, where 100 is defined as perfect health less, and any score less than 100 is defined as poor health.

**Statistical analysis**

Baseline characteristics of categorical variables were evaluated using the Chi-square test. Quantitative variables were evaluated using Student’s t-test, and quantitative variables without normal distribution were measured using the Mann-Whitney U test. Intergroup outcome measures were evaluated through an unpaired t-test. All analyses were carried out on SPSS software v16.

**Results**

A total of 110 participants were selected for primary assessment; 10 individuals were excluded as they did not fulfill the inclusion criteria. In total, 50 participants with chronic health issues and 50 without health issues were evaluated for the study.

Demographic characteristics are shown in Table 1. There was no statistical difference between groups for demographic characteristics.

Table 2 presents Groups A and B scores for the three outcome measures (mental health, sleep quality, and health-related QoL). For all DASS-21 items (mental health), Group A scored higher than Group B, showing higher levels of depression, anxiety, and stress in Group A individuals.

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**Table 1. Demographic characteristics of all patients.**

<table>
<thead>
<tr>
<th></th>
<th>Group A (n=50)</th>
<th>Group B (n=50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years, mean)</td>
<td>53.44</td>
<td>52.76</td>
</tr>
<tr>
<td>Weight (kg, mean)</td>
<td>65.87</td>
<td>66.45</td>
</tr>
<tr>
<td>Height (cm, mean)</td>
<td>163.33</td>
<td>165.33</td>
</tr>
<tr>
<td>Gender (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>70</td>
<td>50</td>
</tr>
<tr>
<td>Male</td>
<td>30</td>
<td>50</td>
</tr>
<tr>
<td>Body mass index (kg/m², mean)</td>
<td>24.15</td>
<td>23.51</td>
</tr>
<tr>
<td>Smoking history (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>82</td>
<td>75</td>
</tr>
<tr>
<td>Yes</td>
<td>18</td>
<td>25</td>
</tr>
<tr>
<td>Marital status (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>90</td>
<td>85</td>
</tr>
<tr>
<td>Not married</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Education history (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School level</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Undergraduate</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>Postgraduate</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Socioeconomic status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Average</td>
<td>60</td>
<td>50</td>
</tr>
<tr>
<td>High</td>
<td>40</td>
<td>50</td>
</tr>
</tbody>
</table>

Group A, individuals with chronic health issues; Group B, individuals without chronic health issues. Socioeconomic status was calculated as follows: Poor, below Rs 15000/month; average, Rs 15000-100000/month; high, above Rs 100000/month.
Similarly, for PSQI, Group A scored higher than Group B, showing poorer sleep quality for Group A individuals. For all SF-26 items, Group A scored lower than Group B, revealing lower health-related QoL in Group A individuals. Unpaired t-tests showed statistically significant differences between the groups for all variables (p = 0.001).

**Discussion**

Since the WHO declared the COVID-19 outbreak a global pandemic, many individuals, even those who have not been infected by the virus, are required to follow government rules where it was mandatory to stay at home. In this cross-sectional study, we sought to identify the correlation between chronic health issues and depression, anxiety, stress, quality of sleep and QoL in a population-based study in India during lockdown due to COVID-19. Our findings showed that poor mental health, low sleep quality, and low health-related QoL were higher in individuals with chronic health issues compared with individuals without chronic health issues at the time of home quarantine in India.

Current evidence reveals that COVID-19 causes fear among the Indian population as they are at home quarantined due to lockdown, which can impact wellbeing, increasing depression, anxiety, stress, reducing sleep quality, and decreasing sleep QoL.15,16

Considering that the lockdown is likely to last for weeks, there is an urgent need to monitor the psycho-physiological wellbeing of the population and to collect research data to develop evidence-based strategies to reduce the negative psychological effects of these unprecedented changes in individuals’ everyday lives17,18, especially in those with chronic health conditions.

This study has some potential limitations: participants were recruited in only one area of India, we had a small sample size, and the only subjective outcome was considered for the study.

**Limitations**

There are inherent limitations to this study. A major limitation of this study was the small sample size. Another limitation of the study was the involvement of only a single medical center. Additional studies from multiple centers are warranted.

**Recommendations**

The present study substantiates that individuals with chronic illness have increased levels of depression, anxiety, stress, reduced sleep quality, and QoL compared with individuals without chronic illness during the quarantine period in India. Therefore, it is recommended that these individuals be constantly monitored for their psychological wellbeing during quarantine. To further substantiate the research, large comprehensive multi-centric studies should be conducted.

**Conclusion**

The WHO has recommended that individuals with physical and mental disabilities need to take extra care during isolation/quarantine for COVID-19.19 This is supported by the results of this study, which revealed an increased level of depression, anxiety, stress, and reduced sleep quality. QoL has been shown in individuals suffering from a chronic illness compared with those without chronic illness during the quarantine period in India.

<table>
<thead>
<tr>
<th>Outcome measures</th>
<th>Group A (mean)</th>
<th>Group B (mean)</th>
<th>Difference</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental health (DASS-21)</td>
<td>Depression</td>
<td>11.28</td>
<td>5.23</td>
<td>6.05</td>
</tr>
<tr>
<td></td>
<td>Anxiety</td>
<td>11.14</td>
<td>3.76</td>
<td>7.38</td>
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<tr>
<td></td>
<td>Stress</td>
<td>18.58</td>
<td>4.34</td>
<td>14.24</td>
</tr>
<tr>
<td>PSQI</td>
<td>Sleep quality</td>
<td>9.44</td>
<td>5.24</td>
<td>4.00</td>
</tr>
<tr>
<td></td>
<td>PF</td>
<td>45.21</td>
<td>90.44</td>
<td>45.23</td>
</tr>
<tr>
<td></td>
<td>RL-PH</td>
<td>25.50</td>
<td>63.51</td>
<td>38.01</td>
</tr>
<tr>
<td></td>
<td>RL-EH</td>
<td>32.52</td>
<td>79.46</td>
<td>46.94</td>
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<tr>
<td></td>
<td>ENG</td>
<td>30.50</td>
<td>84.43</td>
<td>53.93</td>
</tr>
<tr>
<td></td>
<td>EWBS</td>
<td>42.88</td>
<td>83.96</td>
<td>42.08</td>
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<tr>
<td></td>
<td>BP</td>
<td>40.00</td>
<td>80.28</td>
<td>40.28</td>
</tr>
<tr>
<td></td>
<td>GH</td>
<td>35.52</td>
<td>73.80</td>
<td>38.28</td>
</tr>
</tbody>
</table>

Data availability
Underlying data

This project contains the following underlying data:
- Group A data

References

7. LAW K: COLLEGE Approved by Bar Council of India and affiliated to Karnataka State Law University, Hubli. KLE Society

Acknowledgments
The author would like to express heartfelt thanks to all the participants who were participated in this study.
Open Peer Review

Current Peer Review Status: ✔️ ❌

Version 1

Reviewer Report 08 April 2021

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Kanwar Hamza Shuja

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2 Capital University of Science and Technology (CUST), Islamabad, Pakistan

Firstly thank you for giving me the chance for reviewing the article. It’s a well written article though there are places where some sentences need to be rewritten and checked for grammar. However, my biggest concern with this article is regarding its sample size. My first question is how did authors come up with a sample size of 50? Did they selected it themselves or what was the reason behind it or did they used sampling size calculator. Because a sample of 50 is too low for concluding this study.

Secondly, again with the sample but this time inclusion criteria for the group B was not set by the authors. Having no inclusion criteria could lead to potentially adding participants who may also be medically ill, or were these participants were inquired prior during recruitment if they are medically sound. And if they were asked that would have become their inclusion criteria. But unfortunately, I was unable to find any such thing in demographic information.

Third the instruments used are for measuring psychological variables in general. What I mean by this is that nowhere was I able to find anything where the participants were asked their thoughts on Covid-19 or its effect on them. Now depression, stress or anxiety could be potentially due to multiple factors same with the reasons for disturbed quality of life or sleep. The authors should have added some questions in demographic which could help the participants and the readers to know that the findings here are actually due to Covid-19 and not due to any external factor.

Fourth it would would be nice if the authors can add limitations and recommendations heading before conclusion.
Thank you and good luck.

Is the work clearly and accurately presented and does it cite the current literature?
Yes
Is the study design appropriate and is the work technically sound?
Yes

Are sufficient details of methods and analysis provided to allow replication by others?
Partly

If applicable, is the statistical analysis and its interpretation appropriate?
Yes

Are all the source data underlying the results available to ensure full reproducibility?
Yes

Are the conclusions drawn adequately supported by the results?
Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Public Health, Criminal Psychology, Clinical Psychology.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to state that I do not consider it to be of an acceptable scientific standard, for reasons outlined above.

Reviewer Report 13 November 2020
https://doi.org/10.5256/f1000research.26834.r73792

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Shyamal Koley
Department of Physiotherapy, Guru Nanak Dev University, Amritsar, India

The Abstract, Introduction, Methods, Results, & Discussion Portions of the article are written nicely. The only correction needed is in Acknowledgments where " The author would......" should be written as " The authors would......".

References portion are written as per the style of the journal and adequate and expressive.
The article is timely written and carries sufficient applicability.

Detailed Report:

COVID-19 is a serious global pandemic which affects physical, mental, social and societal aspects of individuals of all strata of the society. The present study attempted justly in this regard. It is a very recent complication, thus not much literature would be available. Considering the above fact, the literature cited in the article was justified. It was quite difficult to collect the samples in the
time of Lockdown prevailed then nationwide. Still the work would be considered as technically sound. In such type of study, the controls are not necessarily required, pre- and post-conditions may work. The methods and analyses were sound with proper replicability. Though the sample size was small (n=100), statistical analyses (using Chi-square test, Student’s t-test and Man-Whitney U test) were appropriate. The conclusion drawn in the study was adequately supported by the results. Small sample size was one of the limitations of the study.

**Is the work clearly and accurately presented and does it cite the current literature?**
Yes

**Is the study design appropriate and is the work technically sound?**
Yes

**Are sufficient details of methods and analysis provided to allow replication by others?**
Yes

**If applicable, is the statistical analysis and its interpretation appropriate?**
Yes

**Are all the source data underlying the results available to ensure full reproducibility?**
Yes

**Are the conclusions drawn adequately supported by the results?**
Yes

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** Kinanthropometry, Biomechanics, Public Health & Lectinology.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

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Author Response 13 Nov 2020

**Ramesh Patra**, Lovely Professional University, Jalandhar, India

Thank You so much for your Valuable response and comments.

**Competing Interests:** No competing interests were disclosed.
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