RESEARCH ARTICLE

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 1; peer review: 1 approved, 1 not approved]

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Abstract

Background: Since the World Health Organization declared the COVID-19 outbreak a global pandemic, global spread has created several challenges for the general public and health care 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: 50 individuals were recruited between 28th March and 30th April 2020, 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 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.

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 needs to be done for this group of individuals and the Government should plan to care of these individuals.

Keywords

COVID-19, Mental Health, Sleep Quality, Quality of Life

Open Peer Review

Approval Status

	1	2
version 2 (revision) 30 Jun 2022		
version 1 17 Jul 2020	 view	 view

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2. **Kanwar Hamza Shuja** , National Institute of Psychology (NIP), Quaid-I-Azam University (New Campus), Islamabad, Pakistan
Capital University of Science and Technology (CUST), Islamabad, Pakistan

Any reports and responses or comments on the article can be found at the end of the article.

This article is included in the **Emerging Diseases and Outbreaks** gateway.

This article is included in the **Coronavirus** collection.

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Author roles: **Patra RC:** Conceptualization, Data Curation, Formal Analysis, Funding Acquisition, Investigation, Methodology, Project Administration, Resources, Software, Supervision, Validation, Visualization; **Kanungo B:** Software, Supervision, Validation, Visualization, Writing – Original Draft Preparation, Writing – Review & Editing; **Bawa P:** Writing – Review & Editing

Competing interests: No competing interests were disclosed.

Grant information: The author(s) declared that no grants were involved in supporting this work.

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First published: 17 Jul 2020, 9:718 <https://doi.org/10.12688/f1000research.24321.1>

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^{1,2}. As neither a treatment nor vaccine have 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^{3,4}. Many organizations are already working to increase awareness about the societal impact of the on-going pandemic⁵. 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 lockdown⁵⁻⁷.

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 exert a negative effect on an individual's quality of life (QoL)^{8,9}. Evidence suggests that there is a direct relationship between mental health and sleep quality, a crucial public health issue^{10,11}. In this study, we 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

During the conduct of the study, all human ethical principles as per the World Medical Association's Declaration of Helsinki (2013) and the guidelines of Good Clinical Practice (Indian Council of Medical Research) were observed.

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 procedure of data collection, and a written consent form was obtained from all the participants prior to the study start.

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 lock down 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. 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.

Participants were recruited from individuals undergoing physio treatment at the Department of Physiotherapy, LPU (even

though lockdown was ongoing, essential services, such as physio appointments, were ongoing).

Using the convenience sampling method, individuals were contacted via phone to ask if they would like to take part in the study. If the individual consented, in their next physio treatment appointment, they were asked to sign the informed consent form and fill in the three questionnaires (as below).

Group A inclusion criteria: clinically pre-diagnosed with hypertension, diabetics, and chronic musculoskeletal conditions.

Exclusion criteria Groups A and B: history of any malignancy, recent fracture or trauma, osteoporosis, inflammatory arthritis, and/or cauda equine syndrome.

There were no inclusion criteria for Group B.

Outcome measures

Mental health. Depression, anxiety, and stress scale (DASS-21)¹² 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. The scale consists of 21 questions with three subscales of depression, stress, and anxiety and each subscale comprises seven questions each. Each subscale comprises of seven statements regarding how the test subject was feeling over the last week and four responses ranging from 0- did not apply to me at all, 1- applied to me some of the time, 2- applied to me for a considerable amount of time to 3- applied to me very much/most of the time. The total score for each subscale gives the severity of that very symptom which has a range from 0 to 21 for each subscale.

Sleep quality. Sleep quality was evaluated through the Pittsburgh Sleep Quality Index (PSQI)¹³. 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)¹⁴. 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 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 fulfil 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 the scores for Groups A and B for the three outcome measures (mental health, sleep quality and health-related QoL). For all DASS-21 items (mental health),

Table 1. Demographic characteristics of all patients.

	Group A (n=50)	Group B (n=50)
Age (years, mean)	53.44	52.76
Weight (kg, mean)	65.87	66.45
Height (cm, mean)	163.33	165.33
Gender (%)		
Female	70	50
Male	30	50
Body mass index (kg/m ² , mean)	24.15	23.51
Smoking history (%)		
No	82	75
Yes	18	25
Marital status (%)		
Married	90	85
Not married	10	15
Education history (%)		
School level	20	10
Undergraduate	60	40
Postgraduate	20	50
Socioeconomic status		
Poor	0	0
Average	60	50
High	40	50

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.

Table 2. Comparison of outcome measures for Group A and Group B.

Outcome measures		Group A (mean)	Group B (mean)	Difference	P value
Mental health (DASS-21)	Depression	11.28	5.23	6.05	0.001
	Anxiety	11.14	3.76	7.38	0.001
	Stress	18.58	4.34	14.24	0.001
PSQI	Sleep quality	9.44	5.24	4.00	0.001
Quality of life (SF-36) *	PF	45.21	90.44	45.23	0.001
	RL-PH	25.50	63.51	38.01	0.001
	RL-EH	32.52	79.46	46.94	0.001
	ENG	30.50	84.43	53.93	0.001
	EWB	42.88	83.96	42.08	0.001
	BP	40.00	80.28	40.28	0.001
	GH	35.52	73.80	38.28	0.001

PF: physical functioning, RL-PH: role of limitation-physical health, RL-EH: role of limitation-emotional health, EN: energy, EWB: emotional wellbeing, BP: Body pain, GH: general health, DASS=Depression Anxiety Stress Scale, PSQI= Pittsburgh Sleep Quality Index, *Social life (SL) domain was not considered for this study.

Group A, individuals with chronic health issues; Group B, individuals without chronic health issues.

Group A scored higher than Group B, showing higher levels of depression, anxiety and stress in Group A individuals. 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 reveal that COVID-19 causes fear among the Indian population as they are in home quarantined due to lockdown, which can an impact on well-being, increasing the levels of depression, anxiety, stress, reducing sleep quality, and decreasing QoL^{15,16}.

Considering that lockdown is likely to last for weeks, there is an urgent need to monitor the psycho-physiological well-being of the population and to collect research data to develop evidence-based strategies to reduce negative psychological effects of these unprecedented changes in individuals' everyday lives^{17,18}, 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 only subjective outcome was considered for the study

Conclusion

The WHO has recommended that individuals with physical and mental disabilities need to take extra care during isolation/quarantine for COVID-19¹⁹. This is supported by the results of this study, which revealed that there is an increased level of depression, anxiety, stress, and reduced sleep quality and QoL shown in individuals suffering from chronic illness compared with individuals without chronic illness during the quarantine period in India.

Data availability

Underlying data

Figshare: Mental Health, Sleep Quality and Quality of Life in Subjects with Multiple Health Conditions during Home Quarantine for COVID-19 Pandemic Attack: A Comparison with Healthy Subjects, <https://doi.org/10.6084/m9.figshare.12612833>²⁰.

This project contains the following underlying data:

- Group A data
- Group B data

Data are available under the terms of the [Creative Commons Zero "No rights reserved" data waiver](#) (CC0 1.0 Public domain dedication).

Acknowledgments

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

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<http://www.doi.org/10.6084/m9.figshare.12612833.v1>

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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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 needs 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.

Author Response 16 Jun 2022

Ramesh Patra

First, we would like to thank the honourable reviewers and editor for their constructive criticisms and suggestive comments, which were of great help in improving the quality and clarity of the current manuscript. We have read each reviewer's comments carefully and, accordingly, made utmost efforts to address each comment point-by-point. We much appreciate the reviewer's time, effort, and detailed explanations. We believe that the revised version of our manuscript is now more focused, scientific, understandable, and better arranged. All changes are highlighted with red color.

Reviewer Comment:

Query 1:

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 needs to be rewritten and checked for grammar.

Response:

Thank you for your valuable comments. We have modified the text with proper grammar usage as per your suggestions.

Query 2:

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.

Response:

The total sample taken was 100. We have calculated the sample size using G power software 3.1 which was found to be around 51 (95% confidence interval, power of the study was 80% where the effect size was considered as 0.5). The sample size calculation has been added in the revised manuscript under the method section.

Query 3:

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 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.

Response:

As suggested, we have included the inclusion criteria for Group B.

Query 4:

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.

Response:

We have used the following tools to measure all the three measure outcomes.

1. DASS-21 tool was used to measure the mental health.
2. PSQI was used to measure sleep quality.
3. MOS-36 was used to measure the health-related QoL.

We have mentioned the tools in the methodology section and also given references.

Query 5:

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

Response: We have included the limitations and recommendations as per your suggestions.

Competing Interests: No competing interests were disclosed.

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.

Author Response 13 Nov 2020

Ramesh Patra

Thank You so much for your Valuable response and comments.

Competing Interests: No competing interests were disclosed.

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