# The Impact of the COVID-19 Pandemic and Lockdown on Anxiety in the Elderly population: a cross sectional study

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**Abstract -** Background: The coronavirus pandemic is an epidemiological and psychological crisis. The elderly population is considered to be high risk for potential complications arising from the COVID-19 pandemic, and this fact can also potentially lead to anxiety symptoms amongst the elderly. Therefore, a study was conducted to assess the anxiety symptoms in elderly living in few major cities of Rajasthan state in India. Methods: The study was conducted from April 2020 to May 2020 using an online questionnaire which measured the levels of anxiety amongst the elderly population (age ≥ 65 years) living in the community via the GAD-7 (General Anxiety Disorder-7) scale. Responses were received from 162 participants. Data were analyzed using the Chi-square test and logistic regression. The level of statistical significance was kept at p value < 0.05. Results: Around 69.14% of the participants belonged to the age group of 65-74 years; 61.72% of whom were male. Moreover, up to 82.72% of the participants were suffering from one or more chronic medical illnesses. Based on the GAD-7 scores, 30.25%, 12.35%, and 6.17% of the respondents were suffering from mild, moderate, and severe forms of anxiety, respectively. After applying a ≥ 5 score as a cut off score for the GAD-7 scale, 48.77% of the elderly participants were experiencing anxiety symptoms indicating further assessment. In those respondents with anxiety symptoms, significant association was observed with age (p = 0.00), sex (p = 0.04), and the zone of residence (p = 0.00). On the other hand, no significant association was observed with the presence of chronic medical illness such as Diabetes, Hypertension, COPD, etc. with anxiety symptoms (p = 0.77). Conclusion: This study has revealed a high prevalence of anxiety symptoms among the elderly population during the COVID-19 pandemic lock down. We recommend that a pre-planned strategy should be prepared for early identification of vulnerable elderly in the community who are at a greater risk of suffering from anxiety disorder under this stressful period.

**Key words:** elderly; anxiety; COVID-19; pandemic; impact

## Introduction

The COVID-19 (coronavirus disease of 2019) pandemic is affecting people all across the world and a relatively higher mortality is observed among elderly, with rates varying from 3.6% to 14.8% [1]. This fact is also being highlighted in the media, which may possibly result in the creation of fear among the elderly about imminent death. In turn, this may also be contributing to heightened anxiety amongst this particular cohort [1,2].

The prevalence of generalized anxiety disorder in the elderly population is around 9% [3]. Anxiety often co-exists with other psychi-

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atric disorders, such as depression, as well as other medical illnesses like cardiovascular and pulmonary disorders [4]. A recent study that has been conducted in China concluded that 37% of the sampled elderly population is experiencing anxiety as a psychological impact of the current ongoing pandemic [5]. In India, there is a scarcity of reported epidemiological data relating to generalized anxiety disorder in special groups, such as the pediatric and the elderly populations [6].

As the COVID-19 pandemic is turning out to be a major health crisis affecting the whole nation, one should also direct attention to the mental health of the elderly population, being one of the most vulnerable groups. This study aimed to determine the anxiety symptoms, which are induced from the current COVID-19 pandemic in the elderly population in India.

## Subjects and Methods

Study design: The current study was a cross-sectional web-based survey which included participants from few major cities of Rajasthan state in India and were male or female and age equal to or greater than 65 years. This study was conducted by Department of Psychiatry of a tertiary care hospital attached to a medical college in Jaipur, India after taking approval from the institutional ethics committee.

Sample Size Estimation: The desired sample size to guarantee statistical significance was estimated using the formula $N = Za^2 P^{**} (1-P^{**})/d^2$. In this equation, $Za$ was 1.96 (at a 95% confidence level) and the estimated acceptable margin of error for proportion, d, was 0.05. According to the findings of a previous Indian study on burden of mental disorder in India, the prevalence of anxiety disorder among adults was estimated to be around 3.3% [7]. Taking prevalence rate of 3.3%, the sample size was estimated to be a minimum of 47.

The final sample size was not pre-determined, and thereby, all the participants who willingly consented to participate in this study were included in the final sample.

### Data collection

The sample for this survey was based in an elderly population across the Rajasthan state of India. An online, self-administered questionnaire was sent through Google Forms to all potential respondents. A statement related to the consent for participating in the study was presented to the participants in the beginning of the questionnaire and only those who were willing to give consent were asked to participate in the study. No personal details of the participants such as name and email were collected.

A snow-ball sampling strategy [8] was used to recruit participants. As a measure to increase the response rate as much as possible, all potential participants were invited through Whatsapp messages as well as mobile text messages with an embedded link, which would lead them to access the online Google Form. These respondents were also encouraged to invite their elderly family members or friends to take part in this survey by forwarding them the same invitation link.

The online questionnaire contained questions in both English and Hindi language on demographic details, such as, gender, age and zone of residence (on the basis of the number of positive COVID-19 reported cases in that area) as well as the presence of any co-morbidity, such as medical or psychiatric illnesses. A screening question in the beginning of survey was used to filter out respondents with a past history of psychiatric illnesses as exclusion criteria. Only respondents aged 65 and over were included in the study. Respondent were requested to fill the survey only once. A total of 162 responses were received which were analyzed further.

### Survey instrument

The Generalized Anxiety Disorder 7-item (GAD-7) is a valid initial screening tool that is primarily used for generalized anxiety disorder, but it also performs reasonably well as a screening tool for three other common anxiety disorders—Panic Disorder, Social Anxiety Disorder, and Post-traumatic Stress Disorder [9-11] (Cronbach's α = 0.91).

 Abhinav Garg, Gaur, Salvi, Aparna Garg

In this scale, the following cut-offs correlate with the level of anxiety severity: Score 0-4: Minimal Anxiety Score 5-9: Mild Anxiety, Score 10-14: Moderate Anxiety, Score greater than 15: Severe Anxiety. The GAD-7 (General Anxiety Disorder-7) was used as a screening tool for the elderly population living in this study's Indian community, whereby the presence of a cut-off point of five or more was characterized as the presence of anxiety disorders [12].

## Statistical Analysis

The data were analyzed using the IBM SPSS Statistics 23 for windows [13]. In this study, descriptive statistics (frequency, percentages, mean, and standard deviation), and the χ2 analysis were used to analyze the data. AP value of less than 0.05 was considered to be statistically significant.

## Results

The full demographic characteristics of these respondents are given in Table 1. Out of all the participants, 100 were male (61.7%). The highest number of participants were recorded in the 65–74 years age group (n = 112; 69.14%). Furthermore, up to 82.72% (n = 135) of the participants were suffering from one or more chronic medical illnesses.

In this study, 34.6% respondents (n = 56) were living in a red zone (zone with 15 or more reported COVID-19 positive cases in the vicinity), 32.7% of the respondents (n = 53) were living an in an orange zone (zone with less than 15 reported COVID-19 positive cases), whilst 32.7% of the respondents (n = 53) were living in a green zone where there were no reported COVID-19 positive cases, at the time of data collection (Table 1).

**Table 1.** Descriptive Statistics of the Variables and their associations with Anxiety Symptoms Using the Chi Square Tests

| Variables | n (%) | Anxiety Symptoms | | p value |
|---|---|---|---|---|
| | | Anxiety Score Mean (SD) | n (%) | |
| Total | 162 (100) | 5.29 (5.00) | 79 (48.77) | |
| Gender | | | | 0.00 |
| Male | 100 (61.73) | 4.64 (4.75) | 46 (46) | |
| Female | 62 (38.27) | 6.33 (5.26) | 29 (46.77) | |
| Age group (years) | | | | 0.00 |
| 65-74 | 112 (69.14) | 4.27 (4.53) | 43 (38.39) | |
| >75 | 50 (30.86) | 7.56 (5.30) | 36 (72.00) | |
| Zone of Residence | | | | 0.00 |
| Red Zone | 56 (34.57) | 6.85 (5.17) | 38 (67.86) | |
| Orange Zone | 53 (32.73) | 5.16 (5.42) | 22 (41.51) | |
| Green Zone | 53 (32.73) | 3.75 (3.85) | 19 (35.85) | |
| Chronic medical Illness | | | | 0.77 |
| Yes | 135 (83.33) | 5.45 (5.09) | 67 (49.63) | |
| No | 27 (16.67) | 4.44 (4.54) | 12 (44.44) | |

**Table 2.** Severity of anxiety, measured by the GAD-7 Anxiety Test Questionnaire

| Severity of anxiety | Sample (n = 162), frequency (%) | Anxiety Score Mean (SD) |
|---|---|---|
| Minimal (0-4) | 83 (51.23%) | 1.41(1.38) |
| Mild (5-9) | 49 (30.25%) | 6.63 (1.33) |
| Moderate (10-14) | 20 (12.35%) | 12.00 (1.62) |
| Severe (≥15) | 10 (06.17%) | 17.40 (2.27) |

**Table 3.** Binary logistic regression analysis showing the factors associated with Anxiety

| | B | S.E. | Sig. | Exp(B) |
|---|---|---|---|---|
| Age Group | -1.625 | 0.409 | 0.000 | 0.197 |
| Sex | -1.128 | 0.376 | 0.003 | 0.324 |
| Chronic Medical Illness | 0.273 | 0.475 | 0.566 | 1.314 |
| Zone of residence | -0.848 | 0.231 | 0.000 | 0.428 |

B – coefficient for the constant; S.E. – standard error for the coefficient for the constant; Sig. – significance; Exp(B) - exponentiation of the B coefficient

Overall, 48.77% (n = 79) of the participants have registered a GAD-7 score of > 4. The overall mean (SD) anxiety score was 5.29 (5.00 S.D) (please refer to Table 1). In terms of severity of anxiety symptoms, about 30.25% (n = 49) were experiencing mild anxiety symptoms, 12.35% (n = 20) moderate anxiety and 6.17% (n = 10) were experiencing severe anxiety (Table 2).

For analyses purposes, all the participants were divided into two groups based on their GAD-7 scores. Those participants with a score of ≤4 were assigned to the n0,03on-anxiety group, and those participants with a score of ≥ 5 were assigned to the anxiety group.

In the anxiety group, significant associations were observed with age (p = 0.00), gender (p = 0.00) and zone of residence (p = 0.00). No association was found with presence of chronic medical illness. (p = 0.77) (Table 1).

Table 3 shows the binary logistic regression analysis of the factors associated with anxiety. In this study, factors associated with anxiety symptoms identified were age group, Sex, and Zone of residence.

## Discussion

There is very limited information available in the literature regarding the impact of the COVID-19 pandemic and lockdown on the anxiety status of elderly persons. This study sought to assess the presence of anxiety symptoms in the elderly who are considered to be a high-risk population in the current COVID-19 pandemic. Also, elderly population is currently being repeatedly advised to be extra cautious and practice strict social isolation and hand hygiene measures putting them at even higher risk of developing anxiety symptoms in comparison to the general population [1]. To the best of our knowledge, this is the first study that has been conducted in India which specifically assessed the psychological impacts of the COVID-19 pandemic amongst elderly populations.

 Abhinav Garg, Gaur, Salvi, Aparna Garg

According to a recent Indian study on burden of mental disorder in India, the prevalence of anxiety disorder in adult population is 3.3% and the age specific prevalence rate of anxiety disorder in elderly was lower (< 3%) in comparison to adult population in this study [7].

A recent Indian study evaluating psychological impact of COVID-19 using GAD-7 scale in Indian population (n = 1653, mean age = 41.26) found a very high prevalence rate of anxiety symptoms (38.2%) in Indian population [14]. A Chinese study which was recently conducted to evaluated psychological impact of COVID-19 pandemic in elderly population reported prevalence of anxiety symptoms to be 37.1% among elderly population [5]. We observed a significant higher rate of anxiety symptoms (48.77%) among elderly people in our study and which could be due to several factors such as cultural and social differences, fear of contracting the viral infection, uncertainty about the future, a weakened immune system, the presence of chronic medical illnesses, as well as an increased susceptibility to contract the COVID-19 infection, and the citing of several media reports claiming that certain elderly are not being treated sufficiently due to the health-care systems overloading in India [1].

Our study sought to investigate an underrepresented population of the elderly in relation to the COVID-19 pandemic [15]. Elderly populations can be conventionally divided into the early elderly (65-74 years) and the late elderly (75 or older) [16]. Significant differences in the anxiety levels with respect to the early elderly (Mean GAD-7 score of 4.27 [SD = 4.53]) and the late elderly groups (Mean GAD-7 score of 7.56 [SD = 5.30]) were observed in this study. Our findings were in contrast to the findings in the Chinese study which reported no significant difference between different age segments [5]. Interestingly, this Chinese study has also reported significant gender differences in the anxiety symptoms, with women experiencing more anxiety than men and which was in resonance with the finding of our study as a significant difference in the mean GAD-7 scores between the female and male respondents was observed in our study (Table 1).

As India is entering into another phase of the nation-wide imposed coronavirus lockdown, the Indian government has divided all districts of the country in three zones on the basis of the number of positive COVID-19 reported cases. Typically, a red zone comprises districts with >15 positive cases of COVID-19 infection, whilst districts with up to 15 positive COVID-19 cases fall under the orange zone. Moreover, the green zone contains districts with zero reported cases of COVID-19 infection [17]. Significant differences in the anxiety symptoms across various COVID-19 infection zones were observed in this study. Participants living in the red zone were most anxious in comparison to participants living in the orange zone while participants living in the green zone were least anxious (Table 1).

According to published literature, 80-86% of elderly above 65 years of age suffer from at least one chronic medical illness [2]. Comparingly, in this study also, 82.72% of the participants were suffering from one or more chronic medical illnesses. Anxiety symptoms are commonly reported by patients suffering from chronic medical illnesses, especially those who are suffering from cardiovascular or pulmonary diseases [2,18]. Interestingly, no significant associations were observed between the presence of chronic medical illnesses and anxiety symptoms in this study's participants; suggesting that irrespective of the presence or the absence of chronic medical illnesses, the elderly populations are equally anxious about the Coronavirus infection, the imposed lockdown and its further associated complications.

Using binary logistic regression, the risk factor for anxiety in the elderly population identified in this study were age groups, Sex and Zone of residence (Table 3).

This is study is governed by certain limitations. First of all, the study included a modest number of participants, thereby restricting statistical power. Secondly, participants were chosen through a snow-ball, non-probabilistic sampling method, which may not adequately represent the entire population. Thirdly, the self-reporting of the anxiety symptoms by participants was another important limitation as there might be a discrepancy between the actual responses given to the real picture, which could potentially lead to inaccuracies in the information that has been reported. Another very important limitation is that the use of the online questionnaire in the data collection process might have under-represented those elderly persons with limited access to internet, as well as those with no technical knowledge, which could have also potentially skewed the results because of sampling bias.

To conclude, our study has revealed a high frequency of mild anxiety symptoms in elderly population during the COVID-19 pandemic lock down. Since the present pandemic is expected to last a few more months, or even years, we recommend that a pre-planned strategy should be prepared for early identification of vulnerable elderly in the community who are at a greater risk of suffering from anxiety disorder under this stressful period. It would be worthwhile to replicate this study on a bigger sample in order to have wider applicability of findings. Additionally, future researches focusing on longitudinal assessment of anxiety symptoms would serve to strengthen the contribution to the literature currently available on anxiety in elderly population living in the community.

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## Conflict of Interest

The authors declare that there are no conflicts of interest.

## Funding Sources

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# Utjecaj pandemije COVID-19 i karantene na anksioznost u starijoj populaciji: presječna studija

**Sažetak -** Pozadina: Pandemija koronavirusa epidemiološka je i psihološka kriza. Starija populacija smatra se visoko rizičnom za potencijalne komplikacije koje proizlaze iz pandemije COVID-19, što također može dovesti do simptoma anksioznosti kod starijih osoba. Stoga je provedeno istraživanje za procjenu simptoma anksioznosti kod starijih osoba koje žive u nekoliko većih gradova države Rajasthan u Indiji. Metode: Studija je provedena od travnja 2020. do svibnja 2020. godine korištenjem online upitnika koji je mjerio razine anksioznosti među starijom populacijom (dob ≥ 65 godina) koja živi u zajednici a putem skale GAD-7 (GAD-7 skala anksioznosti). Odgovori su dobiveni od 162 sudionika. Podaci su analizirani pomoću Chi-kvadrat testa i logističke regresije. Razina statističke značajnosti zadržana je na vrijednosti p <0,05. Rezultati: Otprilike 69,14% sudionika pripadalo je dobnoj skupini od 65 do 74 godine; od kojih su 61,72% bili muškarci. Štoviše, do 82,72% sudionika patilo je od jedne ili više kroničnih medicinskih bolesti. Na temelju ocjena GAD-7, 30,25%, 12,35%, odnosno 6,17% ispitanika patilo je od blagog, umjerenog i teškog oblika anksioznosti. Nakon davanja ocjene ≥ 5 kao granične vrijednosti za GAD-7 ljestvicu, 48,77% starijih sudionika imalo je simptome anksioznosti što ukazuje na potrebu daljnje procjene. U ispitanika sa simptomima anksioznosti uočena je značajna povezanost s dobi (p = 0,00), spolom (p = 0,04) i zonom boravka (p = 0,00). S druge strane, nije uočena značajnija povezanost prisutnosti kroničnih medicinskih bolesti poput dijabetesa, hipertenzije, KOPB-a itd. sa simptomima anksioznosti (p = 0,77). Zaključak: Ova studija je otkrila visoku prevalenciju simptoma anksioznosti među starijom populacijom tijekom karantene izazvane pandemijom COVID-19. Preporučujemo pripremu unaprijed planirane strategije za ranu identifikaciju ranjivih starijih osoba u zajednici koje imaju veći rizik razvoja anksioznog poremećaja u ovom stresnom razdoblju.

**Ključne riječi:** starije osobe; anksioznost; COVID-19; pandemija; utjecaj