

## EXPLORING COVID-19 ANXIETY IN INDIAN BASED EDUCATION BY MODERATING STRUCTURAL EQUATION MODEL

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**Abstract.** The COVID-19 (coronavirus disease 2019) pandemic is linked to a wide range of psychological effects, including anxiety. Individual, family, and social factors all play a role in the occurrence and intensity of anxiety, which must be identified and addressed for effective interventions. Education is one of these elements. The goal of this study was to see if there was a link between Education and demographic factors in persons living in India at the time of the coronavirus outbreak and COVID-19 anxiety. In the year 2021, a descriptive and correlational study was undertaken in India. The convenience and snowball sampling methods were applied, resulting in a total of 560 samples. The demographic questionnaire, COVID-19 anxiety scale (CAS), and education questionnaire for adults were all completed online.

**KEYWORDS:** Chi-Square Test, T-Test, COVID-19 anxiety scale, Education, Health literacy.

### 1. Introduction

According to the World Health Organization's (WHO) most recent figures, 158,651,638 people have been infected with this disease worldwide, with 3,299,764 deaths. The number of new cases in the last 24 hours (on May 11, 2021) was 606,077, with 10,769 deaths. In India, 2,673,219 people have been infected with the virus, with 75,261 deaths; the number of new cases in the latest 24 hours (on May 11th, 2021) was 18,408, with 351 deaths. COVID 19 is prevalent due to a variety of factors including loss of income, feelings of loneliness and inactivity as a result of home quarantine, unpredictable disease consequences and treatment uncertainty, limited access to basic services, increased alcohol use, and reduced family and social interactions.

Nutbeam states that Education includes functional, interactive and vital areas, and that its importance and impact on the health of individuals in the community in various dimensions is well known and plays an important role in individuals deciding on their health-related needs. Improving Education is associated with consequences such as increasing the potential ability to make informed decisions, reducing health threats, increasing preventive behaviors, improving security, increasing quality of life, and increasing the quality of self-care. Since the crisis of HL has been highlighted in epidemics such as severe acute respiratory syndrome (SARS) and middle east respiratory syndrome (MERS); therefore, it is very common in COVID-19 pandemic.

. Prevention or management of the COVID-19 requires the individual's readiness and ability to adapt to the rapid development of HL related to the epidemic and crisis. In the current situation, the importance of HL is because the rapid and successful implementation of crisis control measures requires the promotion of disease-related HL and collective compliance of all individuals. However, low HL at the time of COVID-19 outbreak may lead to neglecting personal health, improper self-medication, and the use of drugs that are not approved by a health organization. Although HL is one of the modulators of health in different societies today, but the results of studies show low levels of HL in different groups. For example, the results of a systematic review showed that the HL related to COVID-19 was low in 4.3-57.9% and 4.0-82.5% of medical and non-medical groups. The low rate of HL in different social groups highlights the need for studies on measuring HL and its consequences in different societies.

## 2. Materials and Methods

In India, a descriptive and correlational analysis was carried out. A web-based survey of adults living in Indian society was done between January and April 2021. Convenience and snowball sampling approaches were used to select participants. Data was collected via social networking tools popular among the Indian people, such as WhatsApp and Telegram. Then, a message with the study's aims and an invitation to participate in the study was sent to these people. The tool links were supplied to them if they were satisfied with their participation in the study. If they wanted, participants could send tool links to their adult peers and acquaintances. Completing the tools for the samples that were included in the study using the snowball sampling method.

This is a descriptive and correlational study conducted in Iran. Between January and April 2021, a web-based survey of adults living in Indian society was conducted. Participants were selected using convenience and snowball sampling methods. In order to collect data, social networking programs available to the Iranian community such as WhatsApp and Telegram were used. Then a message including the objectives of the study and inviting these people to participate in the study was sent to them. If they are satisfied with participating in the study, the tool links were sent to them. Participants were asked to send tool links to their adult friends and acquaintances if they wished. For the samples that were included in the study by snowball sampling method, completing the tools and sending them to the researcher (first author) meant that the satisfaction of participating in the study was considered. The inclusion criteria were being Iranian and 18 years old and older. Finally, 560 people participated in the present study.

## 3. Measures

### COVID-19 ANXIETY SCALE (CAS)

Alipour et al. (2020) developed and validated this scale to assess COVID-19 anxiety disorder. Using Cronbach's alpha technique, the tool's reliability was = 0.879 for the first factor, =0.861 for the second factor, and = 0.919 for the entire questionnaire. There are 18 items and two factors in the final version of this utility. Items 1 to 9 are

used to assess psychological symptoms, while items 10 to 18 are used to assess physical symptoms. The instrument is graded on a four-point Likert scale (never = 0, sometimes = 1, most of the time = 2, and always = 3); the respondents' highest and lowest scores range from 0 to 54. According to COVID-19, high scores on this scale reflect a higher level of anxiety.

The COVID-19 disease is the worst pandemic outbreak in the new millennium. Caused by the *severe acute respiratory syndrome coronavirus 2* (SARS-CoV-2), the first case was detected in December 2019 in Wuhan, China. Since then, the disease has spread to almost every part of the globe. The spread of the disease was so fast that on January 30, 2020, the WHO declared COVID-19 to be a *Public Health Emergency of International Concern*. As of April 2020, almost 3 million positive cases were confirmed worldwide, with about 200,000 fatalities [1]. In view of the high number of secondary cases arising from one primary case and the population being largely susceptible to infection, the WHO declared COVID-19 disease as a pandemic on March 12, 2020

#### 4. Health Literacy

Montazeri et al. (2014) constructed this tool, and its validity and reliability were tested. Internal consistency is good (Cronbach's alpha ranges from 0.72 to 0.89). There are 33 elements in total, with five dimensions of "access," "reading," "understanding," "appraisal," and "choice." The sum of each subscale's scores yields the raw score of each participant in the subscales, which is then translated to a range of zero to one hundred. The total scores of the subscales (on a scale of zero to 100) are totaled and divided by the number of subscales to determine the score. The participants' HL level is (0-50) insufficient, (50.1-66) insufficient, (66.1-84) sufficient, and (84.1-100) outstanding.

Originally, the interest in health literacy was mainly focused on health care services, and had a limited focus on the ability to handle words and numbers in a medical context. Yet over the years the concept gradually expanded in meaning to also account for more complex and interconnected abilities, such as reading and acting upon written health information, communicating needs to health professionals, and understanding health instructions [1, 2]. More recently, the concept of health literacy has also found its way into public health. So, in addition to the already significant body of literature linking low health literacy to decreased medication adherence, poor knowledge of disease, poor adherence to self-care management, and poor treatment outcomes, there is now an increasing number of studies attesting to the fact that people with lower health literacy are also less likely to engage in health promoting behaviours [3], to participate in screening programs [4, 5] or to use preventive services [6].

#### 5. Data Analysis

The following tests were used: independent t-test, analysis of variance (ANOVA), Pearson correlation test, and logistic regression test. The proposed model of the relationship between Education and COVID-19 anxiety among Iranian adults during the COVID-19 pandemic was tested using a structural equation modelling (SEM)

method based on covariance method, with the moderating role of gender, age, history of chronic disease, history of getting COVID-19, and receiving social support in adults. Multi-group analysis using the test of comparison with models with measurement weights was used to evaluate the moderating influence of demographic variables. The unconstrained model is compared to the Measurement weights model in this manner, and if the Chi-square test is significant, the research variables' moderating role is validated.

The IBM SPSS version 22 software (39) was used in data analysis. Chi-square and ordinal regression procedures were used to determine the factors associated with levels of anxiety. All the variables that were significant at 0.25 level (40) in the chi-square tests were tested in ordinal logistic regression analysis.

## 6. Hypothesis

H1. There is a significant negative relationship between HL and COVID19 anxiety.

H2. Demographic variables moderate the relationship between HL and COVID-19 anxiety.

### 6.1. Chi-square Test:

A **chi-squared test** (also **chi-square** or  $\chi^2$  test) is a [statistical hypothesis test](#) that is [valid](#) to perform when the test statistic is [chi-squared distributed](#) under the [null hypothesis](#), specifically [Pearson's chi-squared test](#) and variants thereof. Pearson's chi-squared test is used to determine whether there is a [statistically significant](#) difference between the expected [frequencies](#) and the observed frequencies in one or more categories of a [contingency table](#).

H1: Affecting factors of health = NOT COVID-19 Anxiety

H2: Affecting factors of health  $\neq$  NOT COVID-19 Anxiety

COVID-19 ANXIETIES	MALE	FEMALE	TOTAL
HUNGER	40	60	100
DISPLACEMENT	15	35	50
POVERTY	55	45	100
CHILD LABOUR	80	70	150
PSYCHOLOGICAL PROBLEMS	50	50	100
TOTAL	240	260	500

COVID-19 ANXIETIES	MALE	EXPECTED VALUES	FEMALE	EXPECTED VALUES	TOTAL
HUNGER	40	48	60	52	100
DISPLACEMENT	15	24	35	26	50
POVERTY	55	48	45	52	100
CHILD LABOUR	80	72	70	78	150
PSYCHOLOGICAL	50	48	50	52	100

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PROBLEMS				
TOTAL	240		260	500

O	E	O-E	(O-E) <sup>2</sup>	(O-E) <sup>2</sup> /E
40	48	-8	64	1.33
15	24	-9	81	3.38
55	48	7	49	1.02
80	72	8	64	0.89
50	48	2	4	0.08
60	52	8	64	1.23
35	26	9	81	3.12
45	52	-7	49	0.94
70	78	-8	64	0.82
50	52	-2	4	0.08
TOTAL				12.89

Calculated Chi-Square value = 12.89

Degree of freedom  $\gamma = (c-1)(r-1) = (2-1)(5-1) = 4$

Level of Significant  $\alpha = 0.1$

Therefore, Tabulate Chi-Square value = Chi-Square (0.1,4) = 7.78

Calculated value > Tabulated value

H<sub>1</sub> is Rejected. H<sub>2</sub> is Accepted. Hence there is a significant relationship between affecting factor of health and COVID-19 Anxiety.

6.2 T-Test:

A t-test is a type of inferential statistic used to determine if there is a significant difference between the means of two groups, which may be related in certain features. It is mostly used when the data sets, like the data set recorded as the outcome from flipping a coin 100 times, would follow a normal distribution and may have unknown variances.

H<sub>1</sub>: There is no significant relationship between affecting factor of health and COVID-19 Anxiety

H<sub>2</sub>: There is a significant relationship between affecting factor of health and COVID-19 Anxiety

$$t = \frac{|\bar{X} - \mu|}{S / \sqrt{n-1}}$$

where  $\bar{X}$  = mean of the sample

$\mu$  = population mean

n = size of the sample

S = standard deviation

Degree of freedom  $\gamma = n-1$

X = 40, 15, 55, 80, 50, 60 35, 45, 70, 50

$$\bar{X} = 40 + 15 + 55 + 80 + 50 + 60 + 35 + 45 + 70 + 50 / 10 = 500 / 10 = 50$$

n = 10

Let  $\mu = 0$

X	$X - \bar{X}$ X-50	$(X - \bar{X})^2$
40	-10	100
15	-35	1225
55	5	25
80	30	900
50	0	0
60	10	100
35	-15	225
45	-5	25
70	20	400
50	0	0
TOTAL		3000

$$S = \sqrt{\frac{\sum (X - \bar{X})^2}{n}} = \sqrt{\frac{3000}{10}} = \sqrt{300} = 17.3205$$

$$t = \left| \frac{\bar{X} - \mu}{S / \sqrt{n-1}} \right| = \frac{50 - 0}{17.3205 / \sqrt{9}} = \frac{50}{17.3205 / 3} = \frac{50}{5.7735} = 8.660$$

Calculated t value = 8.660

Level of Significance  $\alpha = 0.1$

Degree of freedom  $\gamma = n-1 = 10-1 = 9$

$t_{0.1,9} = 1.833$

Hence, Calculated value > Tabulated value

Therefore,  $H_2$  is accepted .  $H_1$  is rejected.

Hence, there is a significant relationship between affecting factor of health and COVID-19 Anxiety.

## 7. Results

### PARTICIPANTS CHARACTERISTICS AND THEIR RELATIONSHIP WITH HEALTH LITERACY AND COVID-19 ANXIETY USING STRUCTURAL EQUATION MODEL

33.6 percent of the 560 people residing in India who took part in the study were between the ages of 25 and 35. The subjects' average age was 35.19 11.83 years. Women made up 54.3 percent of the participants, and 83 percent of them lived in their own homes. The data revealed an 8.4 percent mortality rate among family

members due to COVID-19. Table 1 lists the other demographic features of the study participants. The hypothesis of normality of the HL and COVID-19 anxiety variables was supported by the Kolmogorov-Smirnov test ( $P > 0.05$ ). There was a statistically significant connection between Education and gender ( $P = 0.035$ ), age ( $P = 0.004$ ), and getting social assistance ( $P = 0.022$ ), according to the findings. Women had a greater average Education than men.

First we have done the confirmatory factor analysis, in which we found the factor load of all the questions to be greater than 0.4. The structural model was then analyzed and the results were reported. In this study, the fit of the proposed model was evaluated based on the introduced fit indices. Model fit tests are performed using GFI and AGFI indices, RMSEA index, chi-square, NFI index and CFI index. The results showed that according to CMIN/DF values  $< 5$  and RMSEA  $< 0.1$ , the fit of the proposed model is accepted. To improve the fit of the proposed model, in the next step, the model was modified by drawing a correlation between the errors. The fit indices of the research model before and after modification.

#### 8. Conclusion

Due to the great predicting role of HL in COVID-19 anxiety, it is recommended that programs be developed and implemented during the outbreak of the disease by experts and policy makers in the field of public health to increase Education in physical and mental dimensions through mass media and cyberspace available to adults living in the community. The results showed that female gender, a positive history of chronic disease, COVID-19 disease and lack of social support are moderating factors in the relationship between Education and COVID-19 anxiety. Therefore, these people need educational interventions to promote their Education, as well as interventions such as periodic screening for COVID-19 anxiety and, if necessary, psychological counseling and more serious and longer supportive interventions than other adults in the community.

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