

# Fear of COVID-19 and its Relationship to Wisdom of University Students

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## ABSTRACT

The COVID-19 pandemic has powerfully affected students' life. The current research aimed to investigate the relationship between fear of COVID-19 and wisdom with its dimensions (experience, organization, memories, humor, and openness to experience) among university students and to identify the differences in the study variables according to gender. The sample consisted of (382) male and female post-graduate students from the faculty of education, Minia University, Egypt. For data collection, the researcher applied the fear of COVID-19 scale (by Ahorsu et al., 2020 translated and standardized by the researchers) and the wisdom scale (by Webster, 2003 translated and standardized by the researchers). The findings of our research revealed that there were no statistically significant differences between the means of male and female scores in the fear of COVID-19, wisdom, and its dimensions and there was a statistically significant positive correlative relationship between the experience, memories, openness to experience, and the total degree of wisdom and fear of COVID-19, while there was no statistically significant correlative relationship between organization and humor as two dimensions of wisdom and fear of COVID-19. Considering the results of the study, the researchers presented some recommendations and suggested research.

## Keywords

fear of COVID-19, wisdom, post-graduate students

## Introduction

Fear is an adaptive emotion that mobilizes energy to deal with potential threats. However, if it is not well adjusted to the actual threat, the individual can be incapable of adapting and confronting. Excessive fear may have harmful effects at the individual level as it may cause social anxiety and the societal level as well. Besides, insufficient fear may harm the individual and society (Merten et al., 2020).

Epidemics and diseases are factors that raise the level of anxiety and fear among individuals. The lessons of SARS seem so important today (Kelvin & Rubino, 2020). In February 2020, the World Health Organization announced that the level of Coronavirus disease (covid-19) has risen to a global pandemic. Fear, in this case, represents a distinctive nature of infectious diseases and is directly related to its rate of prevalence, speed, morbidity, and mortality that leads to various psychological and social challenges. Rajkumar (2020) has reviewed several studies related to COVID-19, stating that the symptoms of anxiety,

depression, and sleep disturbance are common among individuals due to this disease. Wang et al. (2020) indicate that following preventive measures to limit the spread of this disease reduces the severity of anxiety and fear of infection symptoms. Also, the increasing concerns about contracting the virus may lead to less risky social behaviors (Kuper-Smith et al., 2020).

Coronavirus is associated with a state of fear and psychological tension and is accompanied by mental preoccupation and behavioral responses worrying about this disease and its complications. Fear of Coronavirus may appear in different facets as in the feeling of the possibility of contracting the disease, fear of death because of this disease, multimedia fear that emerges from hearing news about this disease, closely following what media publish and following the instructions to control its' spread and the behavioral fear that appears in avoiding close contact with others and shaking hands for fear of infection or exaggeration in cleaning hands with sterilizers.

Many reports and studies have been presented on the individuals' fear of COVID-19. Schimmeti et al. (2020) revealed that there are four domains related to fear of this virus as follows: fear of the body, fear of significant others, fear of not knowing, and fear of infection. Moreover, Mertens et al. (2020) divided fear into subjective worry, safety behaviors, and preferential attention. According to Ahorsu et al. (2020), one of the distinctive features of pandemic viral infection is the fear that it could spread to a large sector of society. So that fear here is a negative emotion that manifests itself in extreme levels of emotional avoidance concerning certain stimuli (Perrin et al., 2015). It is associated with clinical phobia and social anxiety disorders and thus, the potential for general fear resulting from a pandemic viral infection could lead to high levels of mental disorders at the individual level.

Furthermore, Mertens's et al. (2020) study revealed that fear of COVID-19 has three predictors; psychological vulnerability factors (i.e., intolerance of uncertainty, worry, and health anxiety), media exposure, and personal relevance (i.e., personal health, the risk for loved ones, and risk control). They stated that there are different topics of concern that were identified based on participants' open-ended responses, including the health of loved ones, health care systems overload, and economic consequences. Labrague et al. (2020) suggested that organizational measures are vital to support the mental health of nurses and address their fear of COVID-19 through peer and social support, psychological and mental support services (e.g., counseling or psychotherapy), provision of training related to COVID-19, and accurate and regular information updates.

Wisdom appears through the requirements of daily life and through the individual's ability to adapt to stressful life situations and facing them with positive solutions to problems. Wisdom is a multidimensional and multifaceted concept that cannot be developed or grew in a vacuum. Thus, people who have experienced a hard life history are those who are pushed to greater wisdom and deeper meanings (Staudinger, 1999; Web, 2002). According to Ardelt (2003), wisdom indicates the process of combining the cognitive, contemplative, and emotional components; and

these components must be in the wise man, where the cognitive aspects are linked to the true desire while the contemplative aspects refer to a clear vision of the truth, and the emotional aspects are related to the individual's ability to manage his emotions efficiently.

Although wisdom has not historically been part of scientific research, psychologists have begun to study wisdom more in an attempt to understand its role and effect on human development (Watson, 2012). The past decade has witnessed a high focus on the concept of wisdom, especially by cognitive and developmental psychologists and those interested in positive forces into life stages (Baltes & Staudinger, 2000). Despite the philosophical origin of wisdom, this concept has emerged in the field of philosophy pointing to the mental process that refers to the individual's positive human forces and employing them for public and personal interests (Baltes & Kunzman, 2004).

Sternberg (2007) defined wisdom as for of typical performance of the individual with insight and knowledge of self and the surrounding world with the issuance of correct judgments in difficult life situations through knowledge, experience, and understanding. It refers to the application of knowledge under difficult and complex circumstances. It is mediated by values towards achieving the goal of the common good. The wise person is distinguished by personal competence, self-knowledge, providing advice, caring for others, social intelligence, and emotional intelligence. Assman (1994) mentioned that a wise man is one who refrains from pushing to change the world according to his desires but seeks to preserve the ecological balance.

Based on previous definitions of wisdom in the literature (Nordstrom, 2007; Baltes & Smith, 2008; Fengyan & Hong, 2012; Noruzi & Hajipour, 2012; Phusopha et al., 2015), the term wisdom throughout this paper is operationally defined by the researchers as the individual's response to the stimuli of knowledge, decision-making, emotional management, and problem-solving, and is measured by the score the participant gets in the wisdom scale prepared in the current research for this purpose.

More specifically, this definition is consistent with Berlin's model of wisdom that goes back to the late eighties of the last century. This model has adopted by various researchers and reached the following conclusions:

- Wisdom is a concept that carries broad common meanings. The linguistic concept of wisdom is distinguished from wisdom associated with psychological concepts such as maturity and creativity.
- Wisdom is characterized by being a state of mind, behavior that includes interaction, and the coordinated balance of mental, emotional, and motivational forms of the human being.
- Wisdom is a judgment on an extraordinary level of human function, and this judgment is related to quality and models of human growth.
- Wisdom correlates to a high degree with personal, interpersonal components, including the ability to listen, correct, and give advice.
- Wisdom includes good intentions that a person uses with himself and with others.

These conclusions prompted seven characteristics of wisdom, which are as follows:

- Wisdom represents a high level of knowledge, judgment, and advice.
- Wisdom was known from important and difficult questions and strategies related to behavior in life.
- Wisdom includes recognition of the limits of knowledge, suspicion, and uncertainty about the surrounding world.
- Wisdom represents knowledge of the extraordinary range of depth, measurement, and balance.
- Wisdom represents the knowledge used to improve the condition of him or others.
- Wisdom is difficult to attain and define, so it is not easy to know when it appears.
- Individuals with wise behavior are characterized by openness, good morals, creativity and have personal and social competence, as well as they care about others and help them in order to make them happy (Baltes & Staudinger, 2000; Al-Desouki, 2007).

According to the above-mentioned, the literature suggests that COVID-19 as a threat might be

associated with fear emotions and needs a state of wisdom from the individual. Considering that the wise person seeks to make sound decisions that protect him and others to the same extent, because there is a logical relationship between fear of COVID-19 and wisdom, and within the limits of the researchers' knowledge there is no previous study that dealt with these variables, the current research aims to identify the relationship between wisdom and fear of COVID-19 and to identify the differences in the study variables according to gender. More specifically, we hypothesized that there are no statistically significant differences between the mean scores of male and female university students in both fear of COVID-19 and wisdom and that there is no statistically significant correlative relationship between the study sample scores on the COVID-19 fear scale and their scores on the wisdom scale and its dimensions among university students.

The current research reflects a response to the need to handle the psychological side effects of the coronavirus disease 2019 (COVID-19) pandemic that has caused enormous psychological impacts worldwide through finding out the link between wisdom and fear of COVID-19 among university students. Findings will inform those in charge of youth institutions and directing them to use the techniques of positive psychology that would reduce their tension, anxiety, and fear.

## Methods

### Methodology

In light of the research objectives and hypotheses, the researchers utilized the descriptive and analytical research methodology to shed light on the relationship between the research variables.

### Participants

A total of 136 (84 female and 52 male) university students were selected from the faculty of education, Minia University (age mean=21.93, SD= 0.809) to verify the validity and reliability of the research tools. While, the basic research sample consisted of 382 (278 female and 104 male) students from the faculty of education, Minia University who were chosen to apply the research tools (age mean=26.018, SD= 3.939).

## Measures

After reviewing the literature, psychological heritage, and many measures related to fear of COVID-19, the researchers translated and standardized the Ahorsu et al. (2020) scale. The scale consisted of (7) items. The student has to decide what suits his point of view, their grades are as follows: (5 strongly agree- 4 agree, 3 neutrals- 2 disagree - 1 strongly disagree). The researchers investigate the psychometric properties of the scale.

To verify the scale face validity, the researchers translated the scale from English into Arabic and presented it to three specialized faculty members to ensure the correctness of the translation. The researchers take all their observations and modifications into account. Moreover, the scale

**Fear of COVID-19 Scale (Ahorsu et al. (2020), standardized and translated by the researcher)** presented in its initial form to (5) professors from the mental health and psychology departments as jury members to determine the suitability of the scale items to measure fear of COVID-19 among university students. They do not suggest any modifications, but their observations regarding formulating appropriate language.

Construct validity was calculated through the correlation coefficients between each item degree and the scale overall degree- after deleting the item score from the total score of the dimension- on (136) male and female university students. The correlation coefficients ranged between (0.740-0.866) which were significant at the (0.01) level, indicating the internal consistency of the scale components (see table 1).

**Table 1. Correlation Coefficients between Each Item and the Total Degree of the Scale after Deleting the Item Score n= (136)**

Fear of COVID-19 Total Degree	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7
Correlation Coefficient	Correlation Coefficient	Correlation Coefficient	Correlation Coefficient	Correlation Coefficient	Correlation Coefficient	Correlation Coefficient	Correlation Coefficient
**0.776	**0.740	**0.785	**0.770	**0.808	**0.801	**0.866	

\*\* Significant at (0.01) level.

The researchers verified the scale validity statistically through factorial validity after confirming the appropriateness of the sample and the scale for this statistical method by using Kaiser-Meyer-Olkin (KMO) and Bartlett's formulations. The researchers conducted factor analysis for the (7) scale items by using the method of basic components of Hotelling. Moreover, the researchers followed the "Gutman" criterion to determine the number of factors, where the factor is essential if its' latent root is 1

or more. Then the factors were managed orthogonally for every four sections using the Varimax method. Factor analysis resulted in (1) factor interpreting (62.392%) of the total variance, where the factor load of this item was more than (0.30), and this item was the fear of COVID-19. Thus, the number of scale items in its final form was (7) items and the overall degree of the scale ranged from (7-35) according to the Likert five-point scale (see table 2 and 3).

**Table 2. Results of Kaiser-Meyer-Olkin (KMO) Equation to Verify the Suitability of the Research Sample to Perform Factor Analysis and Bartlett's Test to fit the Scale for the Factor Analysis**

Dimension	Kaiser-Meyer-Olkin (KMO)	Bartlett's Test
Fear of COVID-19	0.889	511.932

**Table 3. Results of Factorial Analysis of the Fear of COVID-19 Scale**

Factor	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7
Load	0.784	0.752	0.740	0.764	0.819	0.795	0.867

The previous tables indicated that the results of the factorial analysis closely match the theoretical perception on which the COVID-19 fear scale is based on.

To confirm the fear of COVID-19 scale reliability the researchers utilized Cronbach's Alpha and the

Split-half reliability methods on the research sample assigned for verifying the research tools that consisted of (136) Minia University students (see table 4).

**Table 4. The Cronbach's Alpha and the Split-Half Reliability Coefficients of the Fear of COVID-19 Scale**

Dimension	Item N.	Cronbach's Alpha reliability	Split-half reliability	
			Spearman-Brown equation	Spearman-Brown equation
Fear of COVID-19	7	0.897	0.895	0.889

Consequently, the scale achieves high validity and reliability that enables it to be applied in the basic study.

**Wisdom scale (prepared by Webster (2003), standardized and translated by the researchers)**

After reviewing the literature, psychological heritage, and many measures related to wisdom, the researchers translated and standardized the Webster (2003) scale. The scale consisted of (40) items. The student has to decide what suits his point of view and their grades are as follows: (1 strongly disagree- 2 somewhat disagree- 3 slightly disagree- 4 slightly agree- 5 somewhat agree- 6 strongly agree). The researchers investigate the psychometric properties of the scale.

To verify the scale face validity, the researchers translated the scale from English into Arabic and presented it to three specialized faculty members

to ensure the correctness of the translation. The researchers take all their observations and modifications into account. Moreover, the scale presented in its initial form to (5) professors from the mental health and psychology departments as jury members to determine the suitability of the scale items to measure fear of wisdom among university students. They do not suggest any modifications, but their observations regarding formulating appropriate language.

Construct Validity was also calculated through the correlation coefficients between each item degree and the scale overall degree- after deleting the item score from the total score of the dimension- and the correlation coefficient between the dimension and the total degree of the scale- after deleting the dimension degree of the total score on (136) male and female university students (see table 5 and 6).

**Table 5. The Correlation Coefficient between the item score and the Dimension Score belonging to in the Wisdom Scale (n= 136)**

Dimension	Item	Correlation Coefficient	Dimension	Item	Correlation Coefficient	Dimension	Item	Correlation Coefficient
	1	**0.571		3	**0.515		5	**0.552
	6	**0.593		8	**0.609		10	**0.573

	11	**0.658		13	**0.687		15	**0.577
	16	**0.460		18	**0.725		20	**0.591
<b>Experience</b>	21	**0.613	<b>Memories/ Setbacks</b>	23	**0.665	<b>Openness to Experience</b>	25	**0.561
	26	**0.745		28	**0.617		30	**0.332
	32	**0.592		33	**0.652		35	**0.457
	36	**0.515		38	**0.457		40	**0.576
	2	**0.532		4	**0.459			
	7	**0.567		9	**0.566			
<b>Organization</b>	12	**0.396	Humor	14	**0.672			
	17	**0.734		19	**0.653			
	22	**0.578		24	**0.664			
	27	**0.552		29	**0.555			
	32	**0.532		34	**0.386			
	37	**0.442		39	**0.364			

\*\* Significant at (0.01) level.

**Table 6. The Correlation Coefficients between the Dimension and the Total Degree of the Scale**

Correlation Coefficients	Experience	Organization	Memories/Setbacks	Humor	Openness to Experience
<b>Experience</b>					
<b>Organization</b>	**0.551				
<b>Memories/Setbacks</b>	**0.683	**0.477			
<b>Humor</b>	**0.519	**0.490	**0.565		
<b>Openness to Experience</b>	**0.593	**0.536	**0.530	**0.527	
<b>The Total Scale Degree</b>	**0.838	**0.763	**0.819	**0.772	**0.799

\*\* Significant at (0.01) level.

The researchers verified the scale validity statistically through factorial validity after confirming the appropriateness of the sample and the scale for this statistical method by using Kaiser-Meyer-Olkin (KMO) and Bartlett's formulations. The researchers conducted factor analysis for the (40) scale items by using the method of basic components of Hotelling. Moreover, the researchers followed the "Gutman" criterion to determine the number of factors, where the factor is essential if its' latent root is 1

or more. Then the factors were managed orthogonally for every four sections using the Varimax method. Factor analysis resulted in (5) factors interpreting (43.607%) of the total variance, where factor load of (36) item was more than (0.30), and these items were as follows: the experience with (8) items, the organization with (7) items, experience, and setbacks with (8) items, humor with (6) items, and openness to experience with (7) items. Thus, the number of scale items in its final form was (36) items distributed into the

five scale dimensions and the overall degree of the scale ranged from (36-216) according to the Likert

six-point scale (see table 7 and 8).

**Table 7. Results of Kaiser-Meyer-Olkin (KMO) Equation to Verify the Suitability of the Research Sample to Perform Factor Analysis and Bartlett's Test to fit the Scale for the Factor Analysis**

Dimension	Kaiser-Meyer-Olkin (KMO)	Bartlett's Test
Experience	0.740	214.914
Organization	0.678	153.147
Memories/Setbacks	0.756	264.514
Humor	0.703	182.517
Openness to Experience	0.687	119.306
The Total Degree of the Scale	0.765	2018.57

**Table 8. Results of Factorial Analysis of the Fear of Wisdom Scale**

Item	Dimension 1	Dimension 2	Dimension 3	Dimension 4	Dimension 5	Item	Dimension 1	Dimension 2	Dimension 3	Dimension 4	Dimension 5
1	0.568					21	0.650				
2		0.483				22		0.596			
3			0.465			23			0.695		
4						24				0.652	
5					0.537	25					0.564
6	0.594					26	0.776				
7		0.572				27		0.608			
8			0.574			28			0.652		
9				0.655		29				0.622	
10					0.599	30					
11	0.683					31	0.596				
12						32		0.543			
13			0.681			33			0.681		
14				0.776		34				0.498	
15					0.598	35					0.349
16	0.355					36	0.505				
17		0.787				37		0.417			
18			0.739			28			0.430		
19				0.652		39					
20					0.676	40					0.641
Latent Root	4.316	4.139	3.308	3.088	2.592						
Variance Percentage	10.789	10.349	8.270	7.720	6.479						

The previous tables indicated that the results of the factorial analysis closely match the theoretical perception on which the COVID-19 fear scale is based on.

Split-half reliability methods on the research sample assigned for verifying the research tools that consisted of (136) Minia University students (see table 9).

To confirm the fear of COVID-19 scale reliability the researchers utilized Cronbach's Alpha and the

**Table 9. The Cronbach's Alpha and the Split-Half Reliability Coefficients of the Fear of Wisdom Scale**

Dimension	Item N.	Cronbach's Alpha reliability	Split-half reliability	
			Spearman-Brown equation	Spearman-Brown equation
Experience	8	0.733	0.640	0.640
Organization	7	0.668	0.558	0.519
Memories/Setbacks	8	0.764	0.623	0.620
Humor	6	0.713	0.734	0.733
Openness to Experience	7	0.647	0.597	0.572
<b>The Total Degree of the Scale</b>	36	0.901	0.820	0.820

Consequently, the scale achieves high validity and reliability that enables it to be applied in the basic study.

#### Statistical Analysis Methods

To test the validity of the hypotheses, the SPSS statistical package was used to perform the statistical treatment. The t-test and Pearson correlation coefficient were used to verify the study hypotheses.

#### Results and Discussion

**Results of validating the first hypothesis "There are no statistically significant differences between the mean scores of male and female university students in both fear of COVID- 19 and wisdom ": To validate this hypothesis, the researchers utilized the t-test of two independent samples (see table 10).**

**Table 10. Arithmetic Mean, Standard Deviation, (t) value and Its Significance for the Differences between the Mean Scores of Males and Females in Fear of COVID-19 and Wisdom**

Dimension	Gender	No.	Mean	Std. Deviation	t-value	Sig.
<b>Fear of COVID-19</b>	Male	278	21.07	7.14	0.84	not significant
	Female	104	20.38	7.05		
<b>Experience</b>	Male	278	38.92	6.13	0.69	not significant
	Female	104	38.43	6.11		
<b>Organization</b>	Male	278	39.48	5.96	1.40	not significant
	Female	104	30.49	6.28		
<b>Memories/Setbacks</b>	Male	278	37.73	6.45	0.08	not significant
	Female	104	37.79	6.27		
<b>Humor</b>	Male	278	26.12	5.97	1.41	not significant
	Female	104	27.01	5.31		
<b>Openness to Experience</b>	Male	278	29.72	6.23	1.28	not significant
	Female	104	30.58	5.67		
<b>The Total Degree of the Scale</b>	Male	278	160.30	22.97	0.84	not significant
	Female	104	162.58	23.12		

**Tabular T = 1.98 at (0.05) level, Tabular T = 2.61 at (0.01) level.**

Table (12) indicates that there were no statistically significant differences between genders (male/female) in the overall degree of fear of COVID-19 and wisdom scale, revealing that the hypothesis has been achieved. This result can be interpreted in light of the findings of the previous studies, the facts demonstrated by the theories, and what was referred to by psychological, social, and educational contexts. Concerning the level of fear of COVID-19 among males and females, prior studies noted that females are afraid of SARS than males (Fisher, 1993; Grossman & Wood, 1993), while other studies failed to demonstrate such differences (Kring & Gordon, 1998; Philippot, 1993). Moreover, studies found that females showed severe levels of fear of COVID-19 compared to males (Cao et al., 2020; Lin, 2020).

Besides, the results of previous studies varied in the differences between genders in wisdom, as the current study results are consistent with the results of Al-Desouki (2007), Ardelt (2003), Shaheen

(2012), and Al-Ziabi (2017), indicating that there were no differences between male and female in wisdom. Whereas, the results are inconsistent with the results of Amer (2012) and Abu Khashaba (2016), illustrating that there were differences between genders in wisdom in favor of males.

The researchers interpreted this result due to the fact that most families-regardless of their children's gender- ensures developing their wisdom, behavioral flexibility, and independence in thinking at the same time, and their behaviors are governed by rules and laws that are wise and mature.

**Results of validating the second hypothesis "There is no statistically significant correlative relationship between the study sample scores on fear of COVID-19 scale and their scores on the wisdom scale and its dimensions":** To validate this hypothesis, the researchers utilized Pearson's simple linear correlation coefficient (see table 11).

**Table 11. Pearson Correlation Coefficient between Fear of COVID-19 and Wisdom among the Study Sample**

Dimension	Wisdom					
	Experience	Organization	Memories/Setbacks	Humor	Openness to Experience	The Total Degree
<b>Fear of COVID-19</b>	<b>**0.207</b>	<b>0.027</b>	<b>**0.202</b>	<b>0.087</b>	<b>**0.0221</b>	<b>**0.212</b>

Table 11 clarifies that this hypothesis is not achieved and that there is a statistically significant positive correlative relationship between experience, memories, openness to experience, the overall degree of wisdom, and fear of COVID-19; while there is no statistically a statistically significant correlative relationship between organization and humor as two dimensions of wisdom and fear of COVID-19.

The second hypothesis can be interpreted in light of the fact that a moderate level of fear of infection is necessary to develop a sense of self-preservation, as the individual's fear for himself and others is one of the wisdom characteristics. Besides, humans' fear stimulates reactions (mostly psychological) that prepare the individual to respond to threatening factors. In this regard, Harper (2020) approved that there is a positive correlative relationship between fear of COVID-

19 and positive behavior change (handwashing and social distance). In other words, negative emotions may have evolved on a large scale to serve more adaptive and protective functions and may in certain situations help to keep up safer. In the present context, negative emotions are protective ones (i.e. encouraging behaviors that promote public health) during the COVID-19 pandemic. Moreover, high concerns about contracting the virus may lead to less risky social behaviors (Kuper-Smith et al. 2020).

The results of the second hypothesis are consistent with Leppin & Aro's (2009) study results stating that there is a correlative relationship between awareness of the risk of exposure to a respiratory epidemic such as flu and between protective behaviors and avoiding contact with others. Besides, The Mortensen et al. (2010) study also showed that subjects who scored low on openness

to experience were more involved in avoiding viral infection.

Therefore, wise thinking according to the theory of balance in wisdom includes the ability to use both knowledge and creativity in order to achieve the common good through a balance between the individual's benefit and the benefit of others (Sternberg, 2007).

### Conclusion

The theoretical implications of the current research are adding more insight into the major role of wisdom and its components in handling fear of COVID-19, as the wise person seeks to take and make sound decisions that save himself and others as well. The research also has a practical implication for stakeholders and university staff members as the results shed the light on the significance of enhancing wisdom among students to encounter the challenges of this era.

### Limitation and Further Studies

A limitation of this research is its population, which was 382 post-graduate students from Minia University. Further studies are recommended to validate the current research results in various communities. The study also does not identify the mediated variables such as the socioeconomic status of the students. Therefore, further studies are recommended to examine the effectiveness of other variables on reducing fear of COVID-19.

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### Authors' Contributions

This article is the outcome of the two authors' combined labor. Each author is responsible for 50 percent of the outcome.

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