
CORRELATION BETWEEN COVID-19 PHOBIA, CONSPIRACY MENTALITY, INTOLERANCE OF UNCERTAINTY, AND VACCINE HESITANCY AMONG ASSIUT UNIVERSITY STUDENTS

Nadia Abd El-Ghany Abd EL-Hameed¹, Mervat Elshahat Ibrahim², Saleh Omar Abdullah³

Assistant professor of Psychiatric and Mental Health Nursing, Faculty of Nursing, Assiut University, Egypt¹

Assistant professor of Family and Community Health Nursing, Faculty of Nursing, Suez Canal University, Egypt²

Lecturer of Psychiatric and Mental Health Nursing, Faculty of Medicine & Health Science, Hodeidah University, Yemen³

ABSTRACT

Background: Coronavirus disease 2019 (COVID-19) pandemic management depends on public acceptance of vaccines and vaccine-induced herd immunity remains the best hope for putting a stop to the pandemic. However, vaccination reluctance for COVID-19 remains a significant issue. **Aim:** This study aimed to explore the correlation between COVID-19 phobia, intolerance of uncertainty, conspiracy mentality and vaccine hesitancy among Assiut University students. **Subjects and method: Design:** A correlational descriptive research design was used. **Setting:** this study conducted in six randomly selected faculties at Assiut University. **Subjects:** A convenient sample of 1300 male and female students from the selected faculties. **Tools:** Socio-demographic data, COVID-19 phobia scale, conspiracy mentality questionnaire, intolerance of uncertainty scale and vaccine conspiracy beliefs scale. **The results:** The participant's students' mean age was 20.52 ± 1.33 years. 80.9% had previously suffered from COVID-19. 73.1% of the students had first degree relatives with COVID-19. The total mean scores of the students regarding COVID-19 Phobia and intolerance of uncertainty scales were (50.30 ± 13.31 and 28.67 ± 9.35) respectively, whereas the mean scores of the conspiracy mentality and vaccine conspiracy beliefs among the students were (29.70 ± 13.12 and 25.98 ± 9.48) respectively. **Conclusion:** The current study revealed a strong correlation between COVID-19, intolerance of uncertainty, vaccine conspiracy and conspiracy mentality among studied students and moderate relation between COVID-19, intolerance of uncertainty, vaccine conspiracy and conspiracy mentality and socio-demographic data. **Recommendations:** Use a different way of social media to explain the importance of vaccines e.g. posters, brochures, gestures, educational videos and innovative technologies such as interactive mobile apps.

Keywords: Conspiracy mentality, COVID-19 phobia, Intolerance of uncertainty, University students, Vaccine hesitancy

INTRODUCTION

Coronavirus disease 2019 (COVID-19) is a contagious disease caused by the severe acute respiratory syndrome virus, coronavirus 2 (SARS-CoV-2). It is considered a worldwide health emergency with serious implications for public health and a global pandemic with serious public health implications around the world (Gorbalenya, et al., 2020; WHO, 2020a).

On 26 December 2021, the number of cases reported globally exceeds 278 million; globally mortality remains high with more than 10000 deaths reported each day and 5.4 million globally cumulative deaths (WHO, 2021). However, it is indisputable that a licensed vaccine is required to protect the community from these infections and preserve the economy from future disruptions and harm (Anderson, Heesterbeek, Klinkenberg, & Hollingsworth, et al., 2020).

Conspiracy theories are universal when it comes to illumination political happenings and societal marvels. People differ not simply in their level of belief in certain conspiracy theories, but also in their propensity to accept justifications based on these (Martin, Peter, Nick, Nina, & Roland, 2013). Individuals who embrace conspiracy theories and have a low tolerance for uncertainty amplify their hesitation or refusal to receive the coronavirus vaccine (Nazlı, Yiğman, Sevindik, & Deniz, 2022).

Vaccination is the safest and most cost-effective technique for containing the epidemic and promoting herd immunity. Access to vaccination services and vaccine availability is crucial; nevertheless, individuals' vaccination intentions, which include individual requirements, attitudes and vaccination circumstances are also significant drivers in ending the pandemic (Hwang, Kim, & Heo, 2021).

The World Health Organization considers "vaccine hesitancy" among the top ten threats to global health. The COVID-19 epidemic, which may be described as a worldwide emergency scenario, has raised questions about whether it will end the vaccine rejection issue that has worried the public health community for the past few years (Godlee, 2019).

The majority of recent research on vaccination hesitancy and resistance has concentrated on the specific reasons why people are resistant to a certain vaccine or immunization campaigns in general (Umakanthan, Patil, Subramaniam, & Sharma,

2021). A leading strategy will be to identify the psychological mechanisms that characterize vaccination apprehensive people. This method may also allow for the adaptation of public health messaging to these people's psychological characteristics (Cordina, Lauri, & Lauri, 2021).

To date, many psychological factors have been studied concerning vaccine hesitancy, such as altruistic views; personality traits conscientiousness and neuroticism; paranoid beliefs conspiracy and religion; negative attitudes against vaccination have been linked to a lack of trust in societal authorities such as scientists, medical professionals, and government officials (Habersaat & Jackson, 2020; Hornsey, Harris, & Fielding, 2018; Rieger, 2020).

Vaccine hesitancy is increasing globally; however, it differs by country. Given the rise in conspiracy theories around COVID-19, it is critical to uncover the causes of vaccination reluctance. Determining, comprehending managing vaccine acceptability, reluctance and resistance to COVID-19 are critical steps in ensuring the timely and essential administration of a final vaccine (Hornsey, et al., 2018; Kennedy, 2019; Nazh, et al., 2022).

SIGNIFICANCE OF THE STUDY:

Achieving a safe and effective vaccine for COVID-19 will be determined by uptake. If there are people who are hesitant or unwilling to be immunized, the uptake will be restricted. Vaccine hesitation may have consequences for both the individual (higher risk of disease) and possibly the community (greater transmission of the virus) and according to World Health Organization on 6 January 2022, Egypt has fully vaccinated slightly over 23 percent of their population (WHO, 2022).

Higher levels of hesitation about a vaccine have been linked to higher levels of coronavirus conspiracy theories. Preliminary studies have indicated that, approximately 55% of the public are likely to accept a COVID-19 vaccine with relative ease, 25% may be hesitant and 20% are unlikely to accept a (Bertin, Nera, & Delouvé, 2020; Freeman, et al., 2020; Policy Institute, 2020; Savoia, et al., 2021).

In this study, our primary focus is on identifying the correlation between COVID-19 phobia, intolerance of uncertainty, conspiracy mentality and vaccine hesitancy among Assiut University students. Essentially, we would like to estimate the

magnitude of the potential problem, identify pockets of pronounced hesitancy and determine the content of key cognitions driving vaccine hesitancy.

AIM OF THE STUDY:

This study aimed to explore the correlation between COVID-19 phobia, intolerance of uncertainty, conspiracy mentality and vaccine hesitancy among Assiut University students.

Research Questions:

Q1: Is there a correlation between COVID-19 phobia, intolerance of uncertainty, conspiracy mentality and vaccine hesitancy among Assiut University students?

Q2: Is there a relation between socio-demographic and clinical data and intolerance of uncertainty, conspiracy mentality, and “COVID-19 phobia with vaccine hesitancy?”

SUBJECTS AND METHOD:

I. Technical Design

Research design:

A correlational descriptive research design was utilized in this study.

Setting:

This study was carried out at six faculties which have been chosen randomly from the faculties of Assiut University, which includes 20 faculties (16 practical and 6 theoretical). These faculties are four practical faculties (Nursing, Agriculture, Physical Education and Sugar Industry Technology) and two theoretical faculties (Arts and Early Childhood Education) during the academic year 2021-2022.

Subjects:

The study subjects consisted of a convenient sample of 1300 male and female university students from all grades (first, second, third, fourth grades).

Inclusion criteria:

- Students who agree to participate in the study.
- Age from 18 to 24.

Exclusion criteria:

- Students were not accepting to participate in the study.
- Free from COVID-19 infection.

Sample size:

The total numbers of students in the selected faculties were 14451 students, by using the software EPI/Info, version 3,3 with 99.9% confidence interval (CI), the estimated sample size was found to be 1027 students, to compensate for the dropout (25%) was added to the sample size and the final sample size was 1300.

Faculty	Number of students	Sample size
Faculty of Nursing	3178	319
Faculty of Agriculture	1378	120
Physical Education	5402	352
Faculty of sugar industry technology	255	40
Faculty of Art	8578	380
Faculty of early childhood education	993	89
Total	19784	1300

Tools of data collection:

The following tools were used to collect data of the current study:

Tool I: Socio-demographic and clinical data:

These tool included data related to age, gender, marital state, residence, and religion, academic years, working status and living with or without family members. In addition, data on previous experience with COVID-19, treatments given to a COVID-19 patient, COVID-19 experiences between first degree relatives or close friends and deaths due to COVID-19

Tool II: The COVID-19 Phobia Scale (C19P-SE)

Based on the specific phobia criteria of the DSM-5, the C19P-SE was developed and validated in an English language as a self-report tool to measure the levels of COVID-19 phobias among a wide range of age groups (Arpaci, Karatas, Baloglu, & Haktanir, 2020). This scale translated to Arabic language by the researchers. The C19P-SE contains 20 items with four factors: "Psychological, psychosomatic, economic and social." The items are rated on a five-point Likert format from "strongly disagree (1)" to "strongly agree (5)." Total scale scores range between 20 and 100 and higher scores indicate greater phobia.

Tool III: Conspiracy Mentality Questionnaire (CMQ)

The Conspiracy Mentality Questionnaire (CMQ), an instrument designed in an English language by Bruder, Haffke, Neave, Nouripanah, & Imhoff (2013) and translated to Arabic language by the researchers this instrument used to efficiently assess differences in the generic tendency to engage in conspiracist ideation within and across cultures and consisting of five question Participants were asked to rate their certainty on an 11-point scale ranging from 0% (Certainly not) to 100% (Certain). The 11-point scale was coded from 0 to 10. Higher scores on this scale reflect greater generic conspiracist ideation.

Tool IV: Intolerance of Uncertainty Scale, Short Version (IUS-12)

The Intolerance of Uncertainty Scale – Short Version (IUS-12) was designed by Carleton, Norton, & Asmundson (2007) in an English language has 12 items with the five-point Likert scale response format and translated to Arabic language by the researchers. The IUS-12 is composed of two subscales: Prospective anxiety (items 1, 2, 4, 5, 8, 9 and 11), which relates to a desire for predictability, and debilitating anxiety (items 3, 6, 7, 10, and 12), which relates to paralysis caused by uncertainty.

Tool V: Vaccine Conspiracy Beliefs Scale (VCBS)

The VCBS is a brief, valid scale that was developed by Shapiro, Holding, Perez, Amsel, & Rosberger (2016) in an English language and translated to Arabic language by the researchers to assess vaccine-specific conspiracy beliefs and consists of seven items. Participants indicate how much they agree or disagree with a given statement on a seven point scale that ranges from ‘strongly disagree’ (1) to ‘strongly agree’ (7). Higher VCBS scores suggest greater belief in vaccine conspiracies.

II. Operational Design

It consists of the preparatory phase, validity, reliability, pilot study and field work.

Preparatory Phase

This phase involved review of current national and international related literature, articles, periodicals, and internet to acquire theoretical knowledge regarding the study variables.

Validity:

Validity was done for all tools by five experts from faculty members in the nursing and medical field from Assiut University. Three from psychiatric nursing and two from psychiatric medicine were from different academic categories, to confirm the accuracy and relevance of the information and tools. The study tools were independently translated into Arabic and then back into English. The translated and back-translated versions of the scale were compared to confirm comparability in meaning. Expressions of items that showed discrepancies in meaning were modified.

Reliability:

Reliability was carried out by utilizing the Cronbach's alpha coefficient test to the covid-19 phobia scale, conspiracy mentality questionnaire, intolerance of uncertainty scale and vaccine conspiracy beliefs scale. It was ($r= 0.87, 0.88, 0.84, \text{ and } 0.92$) respectively.

Pilot study:

A pilot study was carried out before starting data collection on (130) of University students to test and evaluate the clarity, feasibility, consistency and applicability of the research tools and to estimate the time needed for filling the form and approximate time to complete each questionnaire was 15 minutes. There was no change in the tools; also the tools were clear and understood by the student. So, subjects included in the pilot study were included in the study.

Field Work:

- Data were collected during the period from March to June 2022; each faculty took two weeks for data collated. The researcher took three days each week.
- A copy of the academic schedules for all grades of the faculties participating in this study was obtained.
- The researcher took oral permission from the teaching staff members who were responsible for lectures or sections and gave them a copy of an official approval letter, and then the researcher inquired as to the best time to collect data, either at the beginning or at the end of the lecture or section.
- The data was collected according to the researcher's work conditions and the students' study schedules.
- The researchers introduced themselves to the students and explained the aim and nature of the study in a simple manner. A verbal informed consent was obtained

from each student before collecting any data. It was emphasized to ensure the confidentiality of the data.

- The researcher explained the instructions on how to fill out the form and its main parts. After that, the printed questionnaire forms were distributed to each student wishing to participate in the study. Then students completed the questionnaires.
- The approximate time to complete each questionnaire was 15 minutes depending on the student's answer. The questionnaires were completed under the supervision of the researchers and under the guidance of the faculty staff that are responsible for students during the data collection period. The researcher checked the sheets to ensure the sheet was completely filled.

III. Administration Design:

Prior to data collection, formal permission was obtained from to the deans of the selected faculties to obtain their approval to conduct the research. The researchers introduced themselves to the vice - deans for students' affairs at each, and reminded them of the purpose and nature of the study. Informed consent was taken from the participants in the study, after clarifying the purpose and significance of the study

Ethical consideration:

1. Research proposal was approved by the research and ethics committee at the faculty of nursing Assiut University.
2. The ethical controls for the research were met by the Ethics Committee of the faculty on 25/1/2022 and the Ethics Committee number (IRB) is 2540032.
3. Oral consent was obtained from students who are willing to participate in the study, after clarifying aim of the study.
4. Privacy was provided during data collection.
5. Anonymity and confidentiality has been guaranteed.
6. Students have the right to join in the study.
7. Students have the rights to refuse or to withdraw from the study at any time without giving reason.

IV. Statistical design:

Data were entered and analyzed with the IBM SPSS 26.0 software. Categorical variables were described by number and percent (N, %), where continuous variables described by mean and standard deviation (Mean, SD), and after testing for normality by

Kolmogorov-Smirnov; t-test and ANOVA test used to compare between continuous variables. Pearson correlation coefficient used to assess the association between continuous variables. A two-tailed $p < 0.05$ was considered statistically significant.

RESULTS:

Table (1) shows that, the age of studied students ranged from 18 to 24 years old with mean age of 20.52 ± 1.33 , and 64.6% were males while 35.4% of them were females. 96.8% of students were single, while 3.2% of them were married. The mean score of the number of people living in the housing is 5.76 ± 2.13 (min= 1, max= 12). Nearly 2/3 of the students' were living with their families 68.9%, 80.9% of students have ever experienced COVID-19, 73.1 % of students had first degree relatives with COVID-19, whereas 9.7% of students experienced the death of COVID-19 in first-degree relatives or close friends.

Table (2) shows the total mean score COVID-19 Phobia Scale among studied students was 50.30 ± 13.31 , the highest mean score were related to “psychological” factors and “social” factors was 17.94 ± 5.19 and $12.92.6 \pm 4.71$ respectively. However, the lowest mean score were related to “somatic” factors and “economic” factors were $9.72 \pm 4.19.9$ and 9.72 ± 3.51 respectively. Regarding Intolerance of Uncertainty Scale (IUS-12) was 28.67 ± 9.35 , the highest mean score were related to “prospective anxiety” subscale was 17.71 ± 5 . However, the Lowest mean score were related to “debilitating anxiety” subscale was 10.96 ± 4.71 . According to Conspiracy Mentality Scale (CMS) the mean score was $29.70.0 \pm 13.12$. The mean score of Vaccine Conspiracy Beliefs Scale (VCBS) was 25.98 ± 9.48 .

Table (3) illustrates that, there are a positive, strong statistically significant correlations between the students' total score of COVID-19 Phobia Scale and Conspiracy Mentality Scale, Vaccine Conspiracy Beliefs Scale scores, Intolerance of Uncertainty Scale total score, prospective anxiety and debilitating anxiety subscale scores ($p < 0.000$). In addition there is a positive and strong statistically significant correlation between the students' total Uncertainty Scale score and Conspiracy Mentality Scale as well as Vaccine Conspiracy Beliefs Scale scores ($p < 0.000$). Moreover a positive, strong statistically significant correlation was found between the Conspiracy Mentality Scale score and the Vaccine Conspiracy Beliefs Scale score of the student ($P < 0.000$).

Table (4): shows the comparison between faculties' participant and mean score of the COVID-19 Phobia, Intolerance of Uncertainty, Vaccine conspiracy and Conspiracy Mentality among studied students. It illustrates that, there are significant differences between students of the participating faculties regarding the total scores of COVID-19 Phobia Scale ($P = 0.026$). There were no statistically significant differences between them regarding the total score of Intolerance of Uncertainty while there were statistically significant differences between students of the participated faculties and "Prospective anxiety" ($P = 0.020$). There were strong statistical significant differences found between students of the participated faculties and the total scores of CMS and VCBS ($p < 0.000$) respectively.

Table (5) Firstly, this table illustrates that there were no relationship between socio-demographic data and mean score of the COVID-19 Phobia Scale except the religious of the students, academic years, family diagnosed with COVID-19 and number of people live in the housing ($p = 0.018, 0.003, 0.032$ and 0.000) respectively. Secondly it was found that, there were no relationships between socio-demographic data and mean score of the IUS-12 scale except sex and number of people live in the housing ($p = 0.026$ and 0.003) respectively. Thirdly, there were no relationship between socio-demographic data and mean score of the VCBS scale except with Academic years ($p = 0.008$). Finally, illustrated that there were no relationships between socio-demographic data and mean score of the CMC scale except with diagnosed of COVID-19 and family member or friend died of COVID-19 ($p = 0.037$ and 0.006) respectively.

Table (1): Distribution of the socio-demographic and clinical data of the studied students (N=1300)

Socio-demographic and clinical data	Studied students (N=1300)	
	No	%
Age groups: Mean \pm SD (range)	20.52\pm1.33	18-24
• \leq 20 year	664	51.1
• $>$ 20 years	636	48.9
Gender		
• Male	460	35.4
• Female	840	64.6
Faculty		
• Nursing	319	24.5
• Arts	380	29.2
• Physical Education	352	27.1
• Sugar Industry Technology	40	3.1
• Early Childhood Education	89	6.9
• Agriculture	120	9.2
Academic years		
• First	323	24.8
• Second	340	26.2
• Third	401	30.8
• Fourth	236	18.2
Religious		
• Muslim	1204	92.6
• Christian	96	7.4
Marital Status		
• Single	1258	96.8
• Married	42	3.2
Residence		
• With Family	896	68.9
• External Housing	201	15.5
• University Housing	203	15.6
Number of people live in the housing: Mean \pm SD (range)	5.76\pm2.13	1-12
• \leq 5 person	645	49.6
• $>$ 5 person	655	50.4
Diagnosed with COVID-19		
• Yes	248	19.1
• No	1052	80.9
Family been diagnosed with COVID-19		
• Yes	350	26.9
• No	950	73.1
Family member or friend died of COVID-19		
• Yes	126	9.7
• No	1174	90.3
Working status		
• Working	196	15.1
• Not working	1104	84.9

Table (2): Mean and total scores COVID-19 phobia, intolerance of uncertainty, vaccine conspiracy and conspiracy mentality scores among studied students (N=1300)

Scales	Mini.-Max.	Mean ± SD
Total score COVID-19 Phobia	20-100	50.30±13.31
Psychological factors	6-30	17.94±5.19
Somatic factors	5-25	9.72±4.19
Economic factors	4-20	9.72±3.51
Social factors	5-25	12.92±4.17
Total score intolerance of uncertainty	12-60	28.67±9.35
Prospective anxiety	7-35	17.71±5.91
Debilitating anxiety	5-25	10.96±4.71
Total score Vaccine conspiracy	7-49	25.98±9.48
Total score Conspiracy Mentality	0-50	29.70±13.12

Table (3): Correlation between COVID-19 phobia, intolerance of uncertainty, vaccine conspiracy and conspiracy mentality among studied students (N=1300)

Scales	Studied students					
		Total score of conspiracy Mentality	Total score of vaccine conspiracy	Total score of intolerance of uncertainty	Total score of prospective anxiety subscale	Total score of debilitating anxiety subscale
Total score COVID-19 Phobia	r-value	0.161	0.215	0.335	0.313	0.272
	P-value	0.000**	0.000**	0.000**	0.000**	0.000**
Psychological factors	r-value	0.229	0.201	0.280	0.305	0.172
	P-value	0.000**	0.000**	0.000**	0.000**	0.000**
Somatic factors	r-value	-0.043	0.127	0.213	0.162	0.219
	P-value	0.124	0.000**	0.000**	0.000**	0.000**
Economic factors	r-value	0.154	0.178	0.259	0.226	0.231
	P-value	0.000**	0.000**	0.000**	0.000**	0.000**
Social factors	r-value	0.116	0.160	0.287	0.265	0.237
	P-value	0.000**	0.000**	0.000**	0.000**	0.000**
Total score intolerance of uncertainty	r-value	0.198	0.269			
	P-value	0.000**	0.000**			
Prospective anxiety	r-value	0.239	0.249			
	P-value	0.000**	0.000**			
Debilitating anxiety	r-value	0.093	0.221			
	P-value	0.001**	0.000**			
Vaccine conspiracy	r-value	0.453				
	P-value	0.000**				
Conspiracy Mentality	r-value					
	P-value					

Pearson correlation

(*) Significant P< 0.05

Table (4): Comparison between faculties studied students and mean score of the COVID-19 phobia, intolerance of uncertainty, vaccine conspiracy and conspiracy mentality (N=1300)

Scales	Studied students						
	Nursing	Arts	Physical Education	Sugar Industry Technology	Early childhood education	Agriculture	P-value
	Mean \pm SD	Mean \pm SD	Mean \pm SD	Mean \pm SD	Mean \pm SD	Mean \pm SD	
Total score of COVID-19 Phobia (C19P-SE)	51.88 \pm 11.96	49.59 \pm 13.92	50.07 \pm 13.07	46.23 \pm 15.35	48.39 \pm 15.40	51.77 \pm 12.61	0.026*
Psychological factors	18.49 \pm 4.45	17.92 \pm 5.60	18.16 \pm 5.24	15.18 \pm 5.57	17.00 \pm 5.71	17.49 \pm 4.58	0.002**
Somatic factors	10.12 \pm 4.31	9.39 \pm 4.00	9.45 \pm 3.96	9.23 \pm 4.23	9.48 \pm 4.60	10.84 \pm 4.59	0.006**
Economic factors	9.86 \pm 3.43	9.49 \pm 3.63	9.71 \pm 3.43	9.63 \pm 3.92	9.48 \pm 3.75	10.28 \pm 3.24	0.341
Social factors	13.42 \pm 3.65	12.79 \pm 4.51	12.75 \pm 4.22	12.20 \pm 4.62	12.43 \pm 4.27	13.15 \pm 3.93	0.139
Total score of intolerance of uncertainty (IUS-12)	29.03 \pm 9.07	27.86 \pm 9.74	29.05 \pm 9.23	25.78 \pm 7.45	28.60 \pm 10.05	30.16 \pm 8.90	0.055
Prospective anxiety	17.94 \pm 5.50	17.13 \pm 6.14	18.23 \pm 6.10	15.83 \pm 5.47	17.18 \pm 6.14	18.42 \pm 5.37	0.020*
Debilitating anxiety	11.09 \pm 4.80	10.73 \pm 4.72	10.82 \pm 4.60	9.95 \pm 3.67	11.42 \pm 5.32	11.74 \pm 4.55	0.192
Total score of Vaccine conspiracy (VCBS)	24.01 \pm 9.34	26.17 \pm 9.84	26.95 \pm 9.38	22.65 \pm 8.54	27.97 \pm 9.49	27.43 \pm 8.21	0.000**
Total score of Conspiracy Mentality (CMQ)	25.49 \pm 12.20	28.67 \pm 13.68	31.64 \pm 12.99	33.03 \pm 11.79	35.93 \pm 11.70	32.66 \pm 11.73	0.000**

ANOVA test

(*) Significant $P < 0.05$

Table (5): Relationship between socio-demographic, clinical data and mean score of the COVID-19 phobia, intolerance of uncertainty, vaccine conspiracy and conspiracy mentality among studied students (N=1300)

Socio-demographic and clinical data	No	C19P-SE	IUS-12	VCBS	CMQ
		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Age groups:					
• ≤ 20 year	664	49.72±13.01	28.70±9.68	25.84±9.41	29.06±13.11
• > 20 years	636	50.90±13.59	28.63±9.00	26.13±9.56	30.35±13.11
P. value		0.108	0.888	0.572	0.077
Gender					
• Male	460	49.82±13.33	29.45±9.11	25.63±9.41	29.65±13.20
• Female	840	50.56±13.30	28.24±9.45	26.17±9.52	29.72±13.08
P. value		0.334	0.026*	0.323	0.934
Academic years					
• First	323	49.28±12.57	28.70±9.92	24.76±9.61	28.67±14.04
• Second	340	49.86±13.60	28.31±9.30	25.50±9.16	29.37±12.29
• Third	401	49.79±12.37	29.18±8.90	26.87±9.47	30.94±12.88
• Fourth	236	53.18±14.99	28.27±9.37	26.85±9.60	29.45±13.30
P. value		0.003**	0.546	0.008**	0.117
Religious					
• Muslim	1204	50.05±13.20	28.57±9.42	25.97±9.47	29.71±13.20
• Christian	96	53.40±14.36	29.89±8.34	26.07±9.61	29.47±12.20
P. value		0.018*	0.185	0.922	0.860
Marital Status					
• Single	1258	50.32±13.29	28.71±9.31	26.00±9.46	29.73±13.08
• Married	42	49.62±13.86	27.36±10.52	25.36±10.08	28.60±14.41
P. value		0.737	0.356	0.665	0.581
Residence					
• With Family	896	50.29±13.62	28.63±9.32	26.08±9.54	29.83±13.01
• External Housing	201	49.53±11.96	28.55±9.30	25.53±9.23	28.17±13.77
• University Housing	203	51.07±13.21	28.97±9.57	26.00±9.50	30.63±12.89
P. value		0.508	0.876	0.758	0.149
Number of people live in the housing:					
• ≤ 5 person	645	48.89±13.71	27.90±8.95	25.60±9.43	29.45±13.28
• > 5 person	655	51.69±12.76	29.42±9.67	26.36±9.52	29.94±12.97
P. value		0.000**	0.003**	0.147	0.498
Diagnosed with COVID-19					
• Yes	248	51.35±12.65	28.72±8.41	25.50±8.90	28.13±12.73
• No	1052	50.05±13.45	28.66±9.56	26.10±9.61	30.06±13.19
P. value		0.164	0.925	0.370	0.037*
Family been diagnosed with COVID-19					
• Yes	350	51.60±13.28	28.83±8.97	26.06±9.49	29.56±13.25
• No	950	49.82±13.29	28.61±9.48	25.95±9.48	29.74±13.08
P. value		0.032*	0.712	0.856	0.825
Family member or friend died of COVID-19					
• Yes	126	51.52±15.06	29.85±10.16	26.98±9.86	32.73±12.51
• No	1174	50.17±13.11	28.54±9.25	25.87±9.44	29.37±13.15
P. value		0.279	0.135	0.215	0.006**
Working status					
• Working	196	49.59±13.64	29.84±9.22	26.71±9.88	30.81±13.88
• Not working	1104	50.42±13.25	28.46±9.36	25.85±9.41	29.50±12.98
P. value		0.418	0.057	0.241	0.197

t-test and ANOVA test

(*) Significant $P < 0.05$

DISCUSSION

An essential public health issue, vaccine hesitancy endangers the population's health, particularly during the current pandemic. Therefore, it's crucial to comprehend the psychological elements that contribute to vaccination reluctance. In this situation, it would be beneficial to explore methods of more healthfully disseminating factual information about the vaccination (Nazlı, et al., 2022). In this regard, this study aimed to explore the correlation between COVID-19 phobia, intolerance of uncertainty, conspiracy mentality and vaccine hesitancy among Assiut University students.

In the present study showed that, nearly three quarter of the students had first degree relatives with COVID-19 and more than two-thirds of students have close family members or friends died of COVID-19. This may be related to the rapid spread of the coronavirus and the lack of effective treatments. This study is also in line with Tang and Xing, (2021), who found that studied participant suffered most after death first degree relatives due to COVID-19. The online survey of Chinese participants, in January 2021, revealed that there were over 86 million COVID-19 confirmed cases, with over 1.8 million deaths. Based on a recent study, for every death due to COVID-19, about 9 family members will be affected and grieve. In addition to the previous studies, Nazlı, et al., (2022) who studied psychological factors affecting COVID-19 vaccine hesitancy and found that 13.5% had close friends or family members dying from COVID-19.

University students are vulnerable to psychological distress in the event of traumatic events. Uncertainty about the course of the pandemic can have long-term effects on mental health. The present study showed that most students have a COVID-19 phobia with mean score equal 50.30 ± 13.31 . This may be related to the university students are a unique social group with active lifestyle pattern based on contacts and relationships, physical activity and academic pursuits, travel and social gatherings. A previous study by Rahman, et al., (2021) who examined the extent and identified factors associated with psychological distress, fear of COVID-19 and coping in Bangladesh, and reported that around a quarter of people were very afraid of COVID-19.

These results are consistent with the study by Villani, et al., (2021) which demonstrated how the COVID-19 pandemic affected the mental health of students at an Italian university. Considering Italy, the COVID-19 pandemic was novel and caused fear, anxiety, and depression, especially in the young and elderly population. Uncertainties

about the virus' characteristics, the lack of available treatments, its rapid spread, and the absence of protective measures all contributed to a significant amount of stress that led to common health disorders.

The current study found a positive, strong statistically significant relation between students' total score for COVID-19 Phobia Scale and their overall IUS-12 score, which may be related to COVID-19 vaccine quality control and side effect profiles. This finding is supported by Nazlı, et al., (2022) who found that a positive, statistically significant relationship between individuals' overall COVID-19 Phobia Scale score and their overall IUS-12 score.

Furthermore, the current study showed that students presented higher levels of anxiety and there was a significant statistically relation between students' total score for COVID-19 Phobia Scale and their prospective anxiety. This can be explained by COVID-19 causing an emotionally disturbing process. This disturbing process and anti-vaccine theses emerging due to their nature may increase uncertainty and misperception.

This result is in line with Cao, et al., (2020) who studied the psychological impact of the COVID-19 epidemic on college students in China, and reported that, the anxiety about the COVID-19 vaccine was high among college students in China. This might have been connected to the virus' impact on their academic pursuits and future employment, while it is in congruent with another study by Gotlib, Jaworski, Wawrzuta, Sobierajski, and Panczyk (2021), who found in their research, that the level of anxiety among the students surveyed was low; more than one third of study participants reported no anxiety at all. COVID-19-related anxiety and health-related fears were associated with higher vaccine acceptance, whereas the fear of social and economic consequences showed the contrary direction.

The present study showed that there is a positive and strong significant statistical correlation was founded between students' total score for COVID-19 Phobia Scale and the Conspiracy Mentality Scale It may be related to vaccine uncertainty and potential conspiracy theories can be predicted to unhelpfully affect vaccine administration in this sense. This study is in the same line as Nazlı, et al., (2022) who found Strong significant statistical correlation between the COVID-19 Phobia Scale and conspiracy mentality (CMS).

The present study showed that there is a positive and strong significant statistical correlation between students' total score for COVID-19 Phobia Scale and total score on the vaccine conspiracy scale. This may be related to the belief that the virus is a synthetic product that may lead to a misjudgment of epidemiological situations and thus may cause a negative attitude towards vaccines. This result is against to the study of Nazlı, et al., (2022) who found a weak relationship between the overall score of COVID-19 Phobia Scale and the overall score of the vaccine conspiracy scale.

The current study found that strong significant statistical correlation between Conspiracy Mentality Scale scores (CMS) and vaccine conspiracy scale score (VCBS). This may be related to the relationship between 'anti-vaccine' beliefs and questioning of authority has been highlighted, and it has been highlighted as an expression of these people's "anti-authority" attitudes. This result is in the same line by Murphy, et al., (2021) who studied psychological characteristics associated with COVID-19 vaccine hesitancy, and stated that, based on their results, those who had COVID-19 vaccine resistance or reluctance were less likely to learn about the outbreak from dependable sources (such as healthcare, professionals, scientists, managers), and had a higher level of mistrust for these sources (conspiracist beliefs). This result also is in agreement with the study by Nazlı, et al., (2022) who found a moderate and significant statistical correlation between the Conspiracy Mentality Scale score and vaccine conspiracy scale score of the participants.

There was a positive, strong significant statistical correlation between students' total score intolerance of uncertainty scale and total score on the vaccine conspiracy scale. This may related to vaccine reluctance has been associated with conspiracy, mistrust, and spiritual beliefs, lack of available data regarding the long-term effects of the vaccine and the general distrust regarding its safety and effectiveness. This result is contrary to Nazlı, et al., (2022) who found statistically significant positive and slight association between the participants' total IUS-12 score and VCBS scores

Concerning relationship between socio-demographic data and mean score of the COVID-19 Phobia, Intolerance of Uncertainty, Vaccine conspiracy and Conspiracy Mentality among studied students, the present study showed that, there were statistical significant relations between COVID-19 Phobia Scale and students' academic years, family diagnosed with COVID-19 and number of people in the house. Also there was

only statistically significant relation between IUS-12 scale and number of people in the house; there was only statistically significant relation between vaccine hesitancy (VCBS) scale and students' academic years; and there were statistically significant relations between the Conspiracy Mentality Scale and diagnosed of COVID-19 and family member or friend died of COVID-19. This results may be due to non-using of suitable tools for study and we need to re-study it with other tools.

This result is against to study which was carried out in India and Saudi Arabia by Jayakumar, et al., (2022) who studied and analyzed the link between mental health and vaccine hesitancy before and after the introduction of COVID-19 vaccinations in India and Saudi Arabia's general populations and reported that Vaccine hesitancy has a negative impact on mental health and vice versa over and In addition to the effects of socioeconomic and demographic variables, coronavirus vaccination, infection status that varies according to the severity of an epidemic, and vaccine requirements. Vaccine hesitancy is a major obstacle to achieving herd immunity against COVID-19.

LIMITATION OF THE STUDY

The Limitation include waiting for students until the end of the lecture or laboratory work. Wasting some questionnaires with students. Students are warned until they have completed filling in the data.

CONCLUSION

Based on the results of it can conclude that, there were strong correlations between COVID-19, intolerance of uncertainty, vaccine conspiracy and conspiracy mentality among studied students and moderate relation between the COVID-19, intolerance of uncertainty, vaccine conspiracy, conspiracy mentality and socio-demographic and clinical data.

RECOMMENDATION

- Design and implement a psycho-education program about the importance of vaccination against COVID-19.
- Use a different way of social media to explain the importance of vaccines e.g. posters, brochures, gestures, educational videos and innovative technologies such as interactive mobile apps.
- Need further study in a large area

REFERENCES

Anderson, R. M., Heesterbeek, H., Klinkenberg, D., & Hollingsworth, T. D. (2020). How will country-based mitigation measures influence the course of the COVID-19 epidemic?. *The lancet*, 395(10228), 931-934.

Arpaci, I., Karatas, K., Baloglu, M., & Haktanir, A. (2020). COVID-19 phobia in the United States: Validation of the COVID-19 Phobia Scale (C19P-SE). *Death studies*, 46:3, 553-559, DOI: 10.1080/07481187.2020.1848945. <https://doi.org/10.1080/07481187.2020.1848945>

Bertin, P., Nera, K., & Delouvé, S. (2020). Conspiracy beliefs, rejection of vaccination, and support for hydroxychloroquine: A conceptual replication-extension in the COVID-19 pandemic context. *Frontiers in psychology*, 11, 2471

Bruder, M., Haffke, P., Neave, N., Nouripannah, N., & Imhoff, R. (2013). Measuring individual differences in generic beliefs in conspiracy theories across cultures: Conspiracy Mentality Questionnaire. *Frontiers in psychology*, 4, 225.

Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., & Zheng, J. (2020). The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry research*, 287, 112934. <https://doi.org/10.1016/j.psychres.2020.112934>

Carleton, R. N., Norton, M. P. J., & Asmundson, G. J. (2007). Fearing the unknown: A short version of the Intolerance of Uncertainty Scale. *Journal of anxiety disorders*, 21(1), 105-117.

Cordina, M., Lauri, M. A., & Lauri, J. (2021). Attitudes towards COVID-19 vaccination, vaccine hesitancy and intention to take the vaccine. *Pharmacy practice*, 19(1), 2317. <https://doi.org/10.18549/PharmPract.2021.1.2317>

Freeman, D., Loe, B. S., Chadwick, A., Vaccari, C., Waite, F., Rosebrock, L., ... & Lambe, S. (2020). COVID-19 vaccine hesitancy in the UK: the Oxford coronavirus explanations, attitudes, and narratives survey (Oceans) II. *Psychological medicine*, 1-15.

Godlee, F. (2019). What should we do about vaccine hesitancy? *British Medical Journal Publishing Group*, 6(7), 365. <https://doi.org/10.1136/bmj.l4044>

Gorbalenya, A. E., Baker, S. C., Baric, R. S., De Groot, R. J., Drosten, C., Gulyaeva, A. A., ... & Ziebuhr, J. (2020). The species Severe acute respiratory syndrome-related coronavirus: classifying 2019-nCoV and naming it SARS-CoV-2. *Nat. Microbiol.* 5, 536–544. *Link: <https://go.nature.com/3cW9qJR>*.

Gotlib, J., Jaworski, M., Wawrzuta, D., Sobierajski, T., & Panczyk, M. (2021). Impact of Anxiety on Readiness for COVID-19 Vaccination among Polish Nursing Undergraduate Students: Nationwide Cross-Sectional Study. *Vaccines*, 9(12), 1385. <https://doi.org/10.3390/vaccines9121385>

Habersaat, K. B., & Jackson, C. (2020). Understanding vaccine acceptance and demand- and ways to increase them. *Bundesgesundheitsblatt-Gesundheitsforschung-Gesundheitsschutz*, 63(1), 32-39. <https://link.springer.com/article/10.1007/s00103-019-03063-0>

Hornsey, M. J., Harris, E. A., & Fielding, K. S. (2018). The psychological roots of anti-vaccination attitudes: A 24-nation investigation. *Health psychology*, 37(4), 307-315.

Hwang, S. E., Kim, W. H., & Heo, J. (2021). Socio-demographic, psychological, and experiential predictors of COVID-19 vaccine hesitancy in South Korea, October-December 2020. *Human Vaccines and Immunotherapeutics*, 6(10) 1-8.

Jayakumar, S., Ilango, S., Kumar K, S., Alassaf, A., Aljabr, A., Paramasivam, A., Mickeymaray, S., Hawsah, Y. M., & Aldawish, A. S. (2022). Contrasting Association Between COVID-19 Vaccine Hesitancy and Mental Health Status in India and Saudi Arabia-A Preliminary Evidence Collected During the Second Wave of COVID-19 Pandemic. *Frontiers in medicine*, 9, 900026. <https://doi.org/10.3389/fmed.2022.900026>

Kennedy, J. (2019). Populist politics and vaccine hesitancy in Western Europe: an analysis of national-level data. *European journal of public health*, 29(3), 512-516.

Murphy, J., Vallières, F., Bentall, R. P., Shevlin, M., McBride, O., Hartman, T. K., McKay, R., Bennett, K., Mason, L., Gibson-Miller, J., Levita, L., Martinez, A. P., Stocks, T., Karatzias, T., & Hyland, P. (2021). Psychological characteristics associated with COVID-19 vaccine hesitancy and resistance in Ireland and the United Kingdom. *Nature communications*, 12(1), 29. <https://doi.org/10.1038/s41467-020-20226-9>

Martin, B., Peter, H., Nick, N., Nina, N. & Roland, I. (2013). Measuring individual differences in generic beliefs in conspiracy theories across cultures: Conspiracy Mentality Questionnaire; *Frontiers in Psychology*. April ;Volume(4) www.frontiersin.org.

Nazlı, Ş. B., Yiğman, F., Sevindik, M., & Deniz Ö. D. (2022). Psychological factors affecting COVID-19 vaccine hesitancy. *Irish journal of medical science*, 191(1), 71–80. <https://doi.org/10.1007/s11845-021-02640-0>

Policy Institute (2020). Coronavirus uncertainties: vaccines, symptoms and contested claims. King's College London. <https://www.kcl.ac.uk/policy-institute/assets/coronavirus-uncertainties.pdf>.

Rahman, M. A., Islam, S. M. S., Tungpunkom, P., Sultana, F., Alif, S. M., Banik, B., ... & Cross, W. M. (2021). COVID-19: Factors associated with psychological distress, fear, and coping strategies among community members across 17 countries. *Globalization and health*, 17(1), 1-19.

Rieger, M. O. (2020). Triggering altruism increases the willingness to get vaccinated against COVID-19. *Social Health and Behavior*, 3(3), 78.-82

Savoia, E., Pillich-Loeb, R., Goldberg, B., Miller-Idriss, C., Hughes, B., Montrond, A., ... & Testa, M. A. (2021). Predictors of COVID-19 vaccine hesitancy: socio-demographics, co-morbidity, and past experience of racial discrimination. *Vaccines*, 9(7), 767.

Shapiro, G. K., Holding, A., Perez, S., Amsel, R., & Rosberger, Z. (2016). Validation of the vaccine conspiracy beliefs scale. *Papillomavirus research*, 2, 167-172.

Tang S. & Xing Z. (2021): Who suffered most after deaths due to COVID-19? Prevalence and correlates of prolonged grief disorder in COVID-19 related bereaved adults, *Globalization and Health* volume 17, and Article number: 19 (2021).

Umakanthan, S., Patil, S., Subramaniam, N., & Sharma, R. (2021). COVID-19 Vaccine Hesitancy and Resistance in India Explored through a Population-Based Longitudinal Survey. *Vaccines*, 9(10), 1064. <https://doi.org/10.3390/vaccines9101064>

Villani, L., Pastorino, R., Molinari, E., Anelli, F., Ricciardi, W., Graffigna, G., & Boccia, S. (2021). Impact of the COVID-19 pandemic on psychological well-being of students in an Italian university: a web-based cross-sectional survey. *Globalization and health*, 17(1), 1-14.

World Health Organization. (2020a). Novel Coronavirus (2019-nCoV): situation report, 11. Available from: <https://apps.who.int/iris/bitstream/handle/10665/330776/nCoVsitrep31Jan2020-eng.pdf> [Accessed December 31, 2021]

World Health Organization. (2020b). Coronavirus disease 2019 (COVID-19): situation report, 130. World Health Organization. Available from: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200529-covid-19-sitrep-130.pdf?sfvrsn=bf7e7f0c_4 [Accessed December 31, 2021]

World Health Organization. (2021). COVID-19 Weekly Epidemiological Update, Edition 72, published 28 December 2021.

World Health Organization. (2022). *Egypt: WHO Coronavirus Disease (covid-19) Dashboard With Vaccination Data*. World Health Organization. Available from: <https://covid19.who.int/region/emro/country/eg> [Accessed January 7, 2022]

العلاقة بين الرهاب من مرض كوفيد-19 وعدم تحمل عدم اليقين وعقلية المؤامرة وتردد اللقاحات بين طلاب جامعة اسيوط

د. نادية عبد الغني عبد الحميد¹، د. مرفت الشحات إبراهيم²، د. صالح عمر عبد الله³

أستاذ مساعد التمريض النفسي والصحة العقلية ، كلية التمريض. جامعة اسيوط¹

أستاذ مساعد تمريض صحة الأسرة والمجتمع ، كلية التمريض، جامعة قناة السويس²

مدرس التمريض النفسي، كلية الطب والعلوم الصحية ، جامعة الحديدة ، اليمن³

الخلاصة

الخلفية: تعتمد إدارة جائحة مرض فيروس كورونا 2019 (كوفيد-19) على القبول العام للقاحات، ولا تزال مناعة القطيع التي يسببها اللقاح هي أفضل أمل لوضع حد للوباء. ومع ذلك، فإن الإحجام عن التطعيم ضد كوفيد-19 لا يزال يمثل مشكلة كبيرة. **هدف الدراسة:** هو الكشف عن العلاقة بين الرهاب من مرض كوفيد-19 وعدم تحمل عدم اليقين وعقلية المؤامرة وتردد اللقاحات بين طلاب جامعة اسيوط. **منهجية الدراسة: التصميم:** تم استخدام التصميم الوصفي الارتباطي. **المكان:** اجريت هذه الدراسة في ست كليات أختيرت عشوائياً بجامعة اسيوط. **عينة الدراسة:** عينة ملائمة مكونة من 1300 طالب وطالبة من تلك الكليات المختارة. **أدوات جمع البيانات:** تضمنت البيانات الاجتماعية والديموغرافية والسرييرية، مقياس رهاب فيروس كوفيد-19، استبيان عقلية المؤامرة، مقياس عدم تحمل عدم اليقين ومقياس معتقدات مؤامرة اللقاح. **النتائج:** كان متوسط عمر الطلاب المشاركين في الدراسة 20.52 ± 1.33 سنة، 80.9% منهم كانوا سابقاً من كوفيد-19، 73.1% من الطلاب لديهم أقارب من الدرجة الأولى اصابوا بمرض كوفيد-19، بلغ متوسط درجات الطلاب فيما يتعلق بالرهاب من مرض كوفيد-19 وعدم تحمل عدم اليقين (50.30 ± 13.31 و 28.67 ± 9.35) على التوالي ، بينما كان متوسط الدرجات فيما يتعلق بعقلية المؤامرة ومعتقدات مؤامرة اللقاح بين الطلاب ($29.70.0 \pm 13.12$ و 25.98 ± 9.48) على التوالي. **الاستنتاجات:** كشفت الدراسة عن وجود علاقة قوية بين الرهاب من مرض كوفيد-19، وعدم تحمل عدم اليقين، والتأمر على اللقاح وعقلية المؤامرة بين الطلاب الخاضعين للدراسة ، ووجود علاقة متوسطة بين الرهاب من مرض كوفيد-19، وعدم التسامح مع عدم اليقين، والتأمر على اللقاح وعقلية المؤامرة و البيانات الاجتماعية والديموغرافية. **التوصيات:** استخدم طرق مختلفة لوسائل التواصل الاجتماعي لشرح أهمية اللقاحات على سبيل المثال الملصقات والكتيبات والاشارات ومقاطع الفيديو التعليمية والتقنيات المبتكرة مثل تطبيقات الجوال التفاعلية.

الكلمات المرشدة: تردد اللقاح، رهاب كوفيد-19، عدم تحمل عدم اليقين، عقلية المؤامرة، طلاب الجامعات