

Generalized Anxiety Disorder in University of Technology Undergraduate Students during COVID-19 Pandemic, Iraq

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Abstract

Background: Since the start of the COVID-19 outbreak in December 2019, the quarantine measures taken, including closing the markets, taking long leave from work, closing worship places, social distancing, and even affecting education by closing schools and universities, quarantine, self-isolation, and sudden fear of death, have increased the level of anxiety in general, and on students in particular. **Objectives:** To find out the prevalence of anxiety among undergraduate students at Technology University during COVID-19, to find out whether COVID-19 affected the student's performance, and to find the association between anxiety and certain demographic characteristics during the outbreak. **Method & Cases:** A cross-sectional study with analysis elements, was conducted from 1 February to 1 July 2022 by collecting online questionnaire answers from students from Technology University. **Results:** There were 703 responses received, and more than half of the participants had received psychological support 385 (54.76%). The total GAD-7 screening tool was mild anxiety 140 (19.9%), moderate anxiety 317 (45.1%), moderate-severe anxiety 171 (24.3%), and only severe anxiety found in 75 (10.7%). This study found a significant association between participants' anxiety level with their sex, COVID-19 infection, presence of chronic disease, complicated participants' lives, increase financial needs, taking long leave, isolation from people, and impact on their performance. **Conclusion:** Although undergraduate students' anxiety levels rose as a result of COVID-19, the outbreak had no negative effects on their academic performance. This study found a significant association between participants' anxiety levels and some demographics, their plans, and the impact on their performance.

Keywords

Anxiety, COVID-19, Technology of University, Students, Iraq

1. Introduction

In December 2019, COVID-19 broke out as unexplained viral pneumonia in Wuhan Province, China [1]. WHO declared the novel coronavirus (COVID-19) a global pandemic on March 11, 2020 [2]. Iraq discovered the first case of SARS-CoV-2 in February 2020 [3] and since then, quarantine has taken place by closing the markets, taking long leaves from work, closing worship places, creating social distance, and even affecting education by closing schools and universities, and attending classes, online education was the fundamental way of studying until 2021, during which online courses were still partially included in the educational process.

All people were subjected to the infection with COVID-19, but the focus was on those who are more susceptible to complication from the infection (those with chronic diseases, immune-compromised people, mentally unstable people, advanced age people, etc.) [4]-[6].

Closing educational institutes (schools, universities) has been proven to be effective in containing the infection with COVID-19 but it carried a lot of debate on mental health, social life [7], and the educational process for students, families, and teachers [8].

Quarantine, self-isolation, and sudden fear of death have an impact on the increased level of anxiety in general [9], and on students in particular [10].

Many students had to face personal financial issues due to the loss of student jobs and worries about their financial situation, future education, and career, resulting in emotional health issues, such as fears, frustrations, anxiety, anger, and boredom [11]-[14].

Anxiety is a feeling of unease, such as worry or fear, that can be mild or severe. Their feelings of anxiety are more constant and can often affect their daily lives [15].

(3.6%) globally live with anxiety [16], in a WHO report that surveyed international college students at 19 colleges across eight countries (Australia, Belgium, Germany, Mexico, Northern Ireland, South Africa, Spain, USA), about 35% of first-year college students reported mental health disorders [17]. In a study in Iraq among healthcare medical students, more than one-half (52.1%) of the participants had scores that indicated anxiety symptoms, while 20.1% had scores that indicated anxiety borderline symptoms [18]. Anxiety may cause personal, health, societal, and occupational problems [19].

A cause of concern globally is poor mental health among university students. A previous systematic review indicated that university students have higher rates of depression than the general population. Academic load, health concerns, heavy

workloads, financial concerns, and student abuse and mistreatment are only a few factors that contribute to psychological morbidity among students [20].

It's important to understand whether the COVID-19 outbreak has had an impact on increasing the level of anxiety among students, affecting their performance and quality of life, or whether it increased the impact of different types of burdens added to students during the outbreak.

2. Objectives

1) To find out the prevalence of anxiety among undergraduate students at Technical University during COVID-19.

2) To find out whether COVID-19 affected the students' performance.

3) To find the association between anxiety and some demographic characteristic during the outbreak.

3. Method

3.1. Study Design

A cross-sectional study with analysis elements was conducted from 1st Feb. to 1st July 2022 by collecting online questionnaire answers from students at Technology University.

3.2. Ethical Approval

The study protocol has been approved by the research committee of the Al-Resafa Health Directorate using the code of ethics of the Ministry of Health in Iraq. Also, the University of Technology's vice president for scientific affairs and graduate studies gave their approval. The study's goals were stated to every participant, and the consent notice at the start of the computerized questionnaire makes it clear that the data will be kept private.

The researcher's mission of facilitating orders was delivered to all the departments and centers of the University of Technology and centers, mentioning the electronic questionnaire link.

3.3. Study Population

3.3.1. Included Criteria

Its enrollment All the students studying at Technology University from all departments, (engineering departments: Electrical, Electromechanical, Chemical, Civil, Architecture, Mechanical, Computer, Industrial, and Metallurgy; Control & Systems; Biotechnology; Laser Engineering & Nanotechnology; Materials Engineering; Applied Sciences; Computer Science; and research centers) of all ages & both sexes, also on the Facebook sites of the university departments.

3.3.2. Excluded Criteria

Anyone not answering the online (google form).

The tool and questionnaire will not be included.

3.4. The Questionnaire

The questionnaire consists of four parts: the first part (demographic-features) was consists of seven questions (age, sex, marital status, department & presence of chronic diseases).

The second part was the COVID-19 diagnosis: which consisted of five questions (infection history and date of this infection and the diagnostic procedure of COVID-19, whether any psychological support received & from whom).

The third part consists of an anxiety test from the GAD-7 screening tool (generalized anxiety disorder) from the Mental Health American Organization (MHAO) [9], which consists of seven questions. 1—Feeling nervous, anxious, or on edge. 2—Not being able to stop or control worrying. 3—Worrying too much about different things. 4—Having trouble relaxing. 5—Being so restless that it's hard to sit still. 6—Becoming easily annoyed or irritable. 7—Feeling afraid, as if something awful might happen.

The fourth part consists of eight questions about the student's life changes & future plan; "Did you felt that COVID-19 complicated your life", "Did you felt that COVID-19 increase your financial need", "Did your taking long leaving", "Did you isolated from people", "Did you felt that COVID-19 impact on your academic performance", "Did you felt that COVID-19 let you spend more time with your family", "Did you felt that COVID-19 let you spend More time finishing delayed works", "Did you felt that COVID-19 let you spend More time with God".

3.5. Sampling Technique

The online questionnaire site was distributed to all the students in technology-university of all departments, all ages & both sexes. Anyone can be involved in this study, and 703 students' responses received from them

3.6. Statistical Analysis Outcomes and Procedures

The answers were downloaded from the electronic form of the Questionnaire (Google-form) to the computer as an excel file and imported to SPSS ver. 26 to be analyzed. An analysis of the data; frequencies, percentages, and a chi-square test, the data were examined.; P-value is regarded as significant if it's less than 0.05.

The scoring of the GAD-7 screening tool

The answers & its score (Not at all = 0, Several days = 1, More than half the days = 2, Nearly every day = 3) total score is a guide to how severe your anxiety disorder may be:

- 0 to 4 = mild anxiety;
- 5 to 9 = moderate anxiety;
- 10 to 14 = moderately severe anxiety;
- 15 to 21 = severe anxiety.

4. Results

There were 703 responses received, with the highest percentage coming from

Chemical Engineering 205 (29.2%), followed by Biotechnology Engineering 81 (11.5%), aged 20 - 29 years 468 (66.6%), male 397 (56.5%), never married 654 (93.0%), 257 (36.6%) thought they were infected by COVID-19, while only 161 (22.9%) had a nasal and/or oral swab, only 62 (8.8%) had a rapid blood test, and 177 (25.2%) were based only 62 (8.8%) had Rapid blood test, and 177 (25.2%) depending on the symptoms only which in Iraq not consider a diagnostic tool. Near half of the students who participated in the study mentioned the presence of chronic diseases 338 (48.1%), most of them had Osteoporosis &/or Vitamin D defiance 217 (30.9%), and psychological problems mentioned by 78 (11.1%) students, shown in **Table 1**.

Table 1. Distribution of participants according to their department, age, sex, marital status, Job description, COVID-19 infection, Diagnostic test, and Chronic disease.

		Frequency	%
Department	Chemical Engineering	205	29.2
	Biotechnology	81	11.5
	Electrical Engineering	80	11.4
	Civil & Architecture Engineering	72	10.2
	Computer Science & Computers Engineering	65	9.2
	Applied Sciences	61	8.7
	Electromechanical Engineering	36	5.1
	Materials Engineering	35	5.0
	research centers & administration	15	2.1
	Laser & Optoelectronics Eng. & Nanotechnology	19	2.7
	Mechanical Engineering	17	2.4
	Control and Systems Engineering	14	2.0
	Industrial and Metallurgy Engineering	3	0.4
Age	≤19 years	212	30.2
	20 - 29 years	468	66.6
	≥30 years	23	3.3
Sex	male	397	56.5
	female	306	43.5
Marital status	currently married	49	7.0
	never married	654	93.0
COVID-19 infection	No	318	45.2
	maybe	128	18.2
	Yes	257	36.6
Diagnostic test	Nasal &/or oral swab (diagnostic test/Iraq)	161	22.9
	Rapid blood test	62	8.8

Continued

	Lung CT scan	12	1.7
	On the symptoms	177	25.2
	No answer	291	41.4
Chronic disease	No chronic disease	365	51.9
	had chronic disease	338	48.1
Chronic disease N= 338	Osteoporosis &/or Vitamin D defiance	217	30.9
	Asthma or COPA	87	12.4
	Psychological problems	78	11.1
	Cardiovascular disease	44	6.3
	allergies	34	4.8
	hypertension	30	4.3
	hematological disease	18	2.6
	Diabetes mellitus	11	1.6
	gastrointestinal & hepatic disease	7	1.0
	Others (Cancer, thyroid disease, & renal disease)	7	1.0

More than half of the participants had received psychological support 385 (54.76%), all received it from their family, relatives, & neighbors additionally; friends including friends on social media give psychological support to 158 (22.5%), Mosque, Husseinia, or Church had support to 24 (3.4%), the government gives psychological support to 7 (1%) the NGOs give psychologically to 8 (1.1%), and lastly 13 (1.8%) of the participants seeking Psychological support from Psychiatrist (Figure 1).

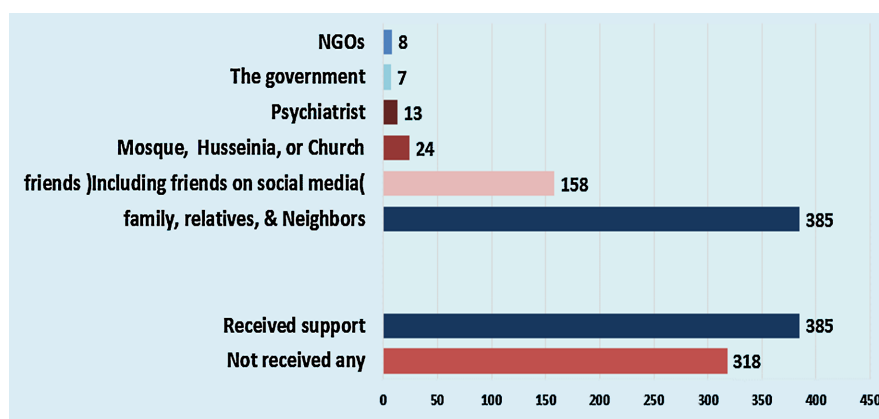


Figure 1. Distribution of sources of psychological support received by participants according during COVID-19 pandemic.

The participants chose mostly “several days” in 1st question 360 (51.2%), 2nd question 286 (40.7%), 3rd question 259 (36.8%), and 4th question 313 (44.5%), while choosing “not at all” in 5th question 340 (48.4%), 6th question 314 (44.7%),

7th question 351 (49.9%). That appeared in **Table 2**.

Table 2. Distribution of participants' generalized anxiety disorder GAD-7 screening tool.

Generalized Anxiety Disorder GAD-7 screening tool		Frequency	Percent
1- Feeling nervous anxious or on edge	not at all	127	18.1
	several days	360	51.2
	more than half the days	121	17.2
	nearly every day	95	13.5
2- Not being able to stop or control worrying	not at all	86	12.2
	several days	286	40.7
	more than half the days	180	25.6
	nearly every day	151	21.5
3- Worrying too much about different things	not at all	93	13.2
	several days	259	36.8
	more than half the days	175	24.9
	nearly every day	176	25.0
4- Trouble relaxing	not at all	89	12.7
	several days	313	44.5
	more than half the days	134	19.1
	nearly every day	167	23.8
5- Being so restless that it is hard to sit still	not at all	340	48.4
	several days	253	36.0
	more than half the days	58	8.3
	nearly every day	52	7.4
6- Becoming easily annoyed or irritable	not at all	314	44.7
	several days	268	38.1
	more than half the days	74	10.5
	nearly every day	47	6.7
7- Feeling afraid as if something awful might happen	not at all	351	49.9
	several days	235	33.4
	more than half the days	59	8.4
	nearly every day	58	8.3

The total GAD-7 screening tool was mild anxiety 140 (19.9%), moderate anxiety 317 (45.1%), moderate-severe anxiety 171 (24.3%), and only severe anxiety found in 75 (10.7%), as shown in **Figure 2**.

Figure 3 shows that 397 (56.5%) of the Participants' performance had not to

impact by COVID-19, and nearly quarter 173 (24.6%) of them mention that their performance may be impacted by COVID-19, while 133 (18.9%) of their performance was impacted by COVID-19.

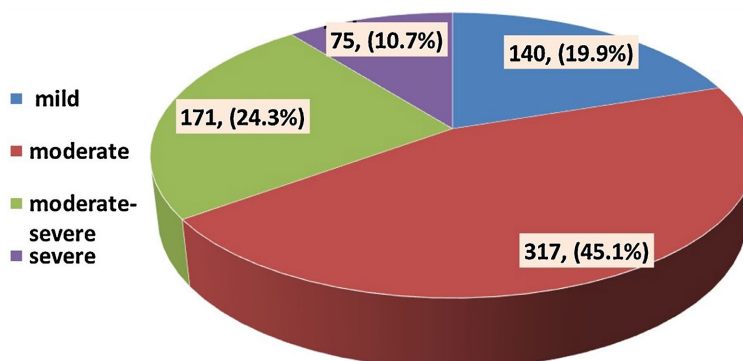


Figure 2. Distribution of participants according to their answer to generalized anxiety disorder the GAD-7 screening tool.

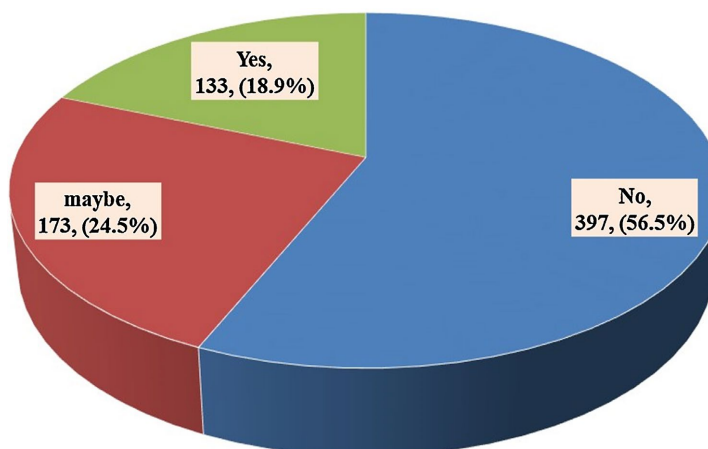


Figure 3. Distribution of participants according to COVID-19 impact on their performance.

The study found a significant association between participants' anxiety level with their sex, Job description COVID-19 infection, and presence of chronic disease as the p-value = 0.000, in all, but not significant with their age & marital status as the p-value (0.620, & 0.428 correspondingly).

Table 3: association between participants feeling in their previous three months with some of their demographic variables.

PT Serif The highest percentage of participants' life 347 (49.4%) had not been complicated by the COVID-19 pandemic, and 343 (48.8%) of them had no additional financial need, 415 (59.0%) not thinking about taking long leave. 323 (56.5%) not thinking about Isolated from other people and lastly, 397 (56.5%) of students had not-effect on their performance.

In conceding to benefits from COVID-19 to having more time with participant's family 383 (54.5%), also to have more time to finish delayed work 256 (36.4%), and to be more time with God (praying, reading Quran or Engel) in 357 (50.8%).

Also, the study found a significant relationship between participants' anxiety levels with complicated participants' life, Increase Financial needs, taking long leave, isolation from people, and impact on their performance (p-values = 0.000, 0.000, 0.019, 0.000, and 0.000 respectively). But participants' anxiety level has no significant relationship with spending more time with their family, spending more time finishing delayed work, spend more time with God, (p-value 0.112, 0.226, & 0.613 correspondingly). All that appeared in **Table 4**.

Table 3. Association between participants feeling in their previous three months with some of their demographic variables.

		In general, describe your saturation in the 3 months ago						Total	P-value
		normal &/or coping	sad, bad, & depression	anxiety, stress & fear	Boring &/or tired	good feeling	no comments		
Total		190	88	55	39	145	186	703	
age	≤ 9 years	70	11	17	8	49	57	212	0.001
	20 - 29 years	116	76	35	30	86	125	468	
	≥30 years	4	1	3	1	10	4	23	
sex	male	102	50	24	22	101	98	397	0.008
	female	88	38	31	17	44	88	306	
Marital status	currently married	11	7	4	4	15	8	49	0.327
	never married	179	81	51	35	130	178	654	
COVID-19 infection	No	87	37	19	12	72	91	318	0.391
	maybe	37	13	11	9	24	34	128	
	Yes	66	38	25	18	49	61	257	

Table 4. Association between participants' anxiety level and some of their life changes & future plan.

		Total	%	anxiety				p-value
				No or mild	Moderate	Moderate-severe	severe	
Complicated participants' life	No	347	49.4	92	168	67	20	0.000
	maybe	207	29.4	28	90	67	22	
	Yes	149	21.2	20	59	37	33	
Increase Financial need	No	343	48.8	87	161	71	24	0.000
	maybe	140	19.9	17	73	33	17	
	Yes	220	31.3	36	83	67	34	
Taking long leaving	No	415	59.0	97	191	89	38	0.019
	maybe	104	14.8	17	49	29	9	
	Yes	184	26.2	26	77	53	28	
Isolation from people	No	323	45.9	89	159	52	23	0.000
	maybe	164	23.3	23	76	48	17	

Continued

	Yes	216	30.7	28	82	71	35	
Impact on my performance	No	397	56.5	96	180	88	33	0.000
	maybe	173	24.6	31	82	44	16	
	Yes	133	18.9	13	55	39	26	
Spend More time with my family	No	171	24.3	42	80	28	21	0.112
	maybe	149	21.2	26	70	36	17	
	Yes	383	54.5	72	167	107	37	
Spend More time finishing delayed works	No	280	39.8	54	120	70	36	0.226
	maybe	167	23.8	41	69	44	13	
	Yes	256	36.4	45	128	57	26	
Spend More time with God	No	186	26.5	45	82	38	21	0.613
	maybe	160	22.8	32	71	40	17	
	Yes	357	50.8	63	164	93	37	

5. Discussion

In our study, about 80% of our sample had anxiety (about 24% had moderate-to-severe anxiety), which is a high rate of anxiety. According to Karim *et al.*, being younger and being a student may have an impact on increasing the rate of anxiety in these categories [21].

55% of our sample had psychological support from family members, neighbors, and relatives, which may be beneficial to decrease the effect of anxiety on the students (45% of our sample has moderate anxiety) [22].

There's significant association between effect on my performance and anxiety. COVID-19 has direct effect on academic performance and mental health [23]. Although 54.8% of the participants had COVID-19 infection with or without confirmatory test, more than half the sample stated that there was no effect on performance and 65% of them had minimal to moderate anxiety. The education in Iraqi universities returned near normal after the second wave of COVID-19 and attending lessons have been returned to fewer hours beside online lessons. This can give idea of returning of social life gradually with friends and increase social activities which might decrease level of anxiety on students [22] and improve their performance [24].

The study results showed a strong association between anxiety and gender during COVID-19. Female students are more likely than male students to experience anxiety when under stress, which may be due to their jobs or household responsibilities [25]. Risk perception is different between sex; this may be due to entrenched sex roles that create dissimilarities in aspects of power relations and labor, in addition to different trusting of authority issues and institutions [26].

A positive COVID-19 infection is also strongly associated with an elevated anx-

xiety level. Several reports suggest that COVID-19 survivors are at increased risk of mood and anxiety disorders 3 months-post-infection [27]-[30]. This can be explained by the fear of another infection or the fear of infecting other family members or beloved ones with SARS-COV-2 and being subjected to the same severe, unusual symptoms of it.

Chronic diseases are also associated with the presence of anxiety. Our study stated that 30% of chronic diseases are caused by vitamin D deficiency. In certain studies, men and women with anxiety have lower levels of calcidiol [31].

The only psychiatric disorder significantly associated with asthma is anxiety, asthma is present in 12% of students. The anxiety-asthma relationship is bidirectional; each can cause or result from the other [32].

Because of the strong association between anxiety and whether COVID-19 complicated participant life, the governments have imposed measures of social isolation and quarantine, banned religious celebrations, closed specific types of establishments, and reduced the activity of others (e.g., restaurants and shops), with serious consequences for entire populations and economies. All these measures together can make life uneasy for people and affect their level of anxiety. This agrees with a study in Portugal, which stated that anxiety and other factors can decrease people's quality of life in conjunction with the pandemic's social and economic consequences [33].

Another association was found between anxiety and an increase in financial needs. Students may be afraid of adverse outcomes due to decreased finances for them and their families, which could affect their life and study as well. This agrees with another study that concluded that GAD in adolescents is closely related to perceived decreased family finances due to COVID-19 [34]. Another study states that social support and government aid financially were associated with better mental health symptoms among women [35].

Taking long leave and anxiety are also significantly associated. Even though Iraqi institutions have embraced online learning for the first and second COVID-19 waves, the prolonged lockdown has had an impact on all areas of education [36]. This may have happened because online education is not available to all, its resources are limited, and there are problems with access, networking, or even knowing how to use a platform. In addition, online education is not set up for practical lessons, which are important for the graduation of students. This agrees with a study in Bangladesh, which states that extended closure may lead to postponing graduation, increasing the chances of stress among students [37].

Isolation from people and anxiety are associated. Social isolation and anxiety are a two-way street it is likely that both things are true. People who experience significant social anxiety commonly withdraw from social situations to reduce their stress. However, over time this can make their anxiety even worse, which only makes them more isolated. The same explanation has been given in a study that showed that loneliness impairs the process by which fears are diminished [38].

Performance and anxiety are associated, students with high levels of anxiety may have low academic performance and, as a result, low graduation marks. This agrees with a study in Malaysia that confirms the relationship between anxiety and academic performance [39].

6. Limitations

The study relies on a convenient sample from an online survey from one university in Baghdad that is specialized in engineering, and may not represent the entire student population in Iraq, so we cannot measure the real effect of COVID-19 on mental health of Iraqi students. Also, the cross-sectional design cannot demonstrate the cause and effect between anxiety and other demographic variables or outcomes, so it's hard to evaluate effect of these psychological aspects and students' achievements in the future.

7. Conclusion

Although undergraduate students' anxiety levels rose as a result of COVID-19, the outbreak had no negative effects on their academic performance. This study found a significant association between participants' anxiety level and their sex, COVID-19 infection, presence of chronic disease, complicated participant life, increased financial needs, taking long leave, isolation from people, and impact on their performance.

8. Recommendation

Improve communication between the university administration and the Iraqi MOH in order to launch a program to handle anxiety among students. Mass media programs must be initiated to limit and decrease anxiety throughout the community. Increase the ability of university health workers to early diagnose cases of anxiety and early referral of complicated cases by developing training programs for GAD-7 screening tools.

Also, developing targeted training for university health services staff on using the GAD-7 for early screening in students.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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