

E-learning: Depression, anxiety, and stress symptomatology among Lebanese university students during COVID-19 quarantine

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Abstract

Background: E-learning has been adopted internationally as the alternative teaching or learning strategy during the coronavirus disease 2019 (COVID-19) quarantine to fill the academic gap that has been created by the existing reality of the pandemic due to nationwide closures.

Aim: This study aims at evaluating the prevalence of depression, anxiety, and stress symptomatology among Lebanese University Students during the COVID-19 Quarantine.

Methodology: A quantitative cross sectional research design, where 520 undergraduate university students were surveyed regarding their satisfaction with e-learning and the prevalence of depression, anxiety, and stress symptomatology using depression, anxiety, and stress scale-21 elements.

Results: Learning through online platforms have given rise to depression and anxiety disorders among undergraduate university students, where there was a significant correlation between student satisfaction and prevalence of depression, anxiety, and stress.

Conclusion: The sudden shift to exclusive e-learning methods of instruction have produced anxiety and depression symptoms among a significant portion of the students due to the stressful load of work required.

KEYWORDS

anxiety, COVID-19, depression, e-learning, stress

1 | INTRODUCTION

Since the novel coronavirus or what is known as coronavirus disease 2019 (COVID-19), has been declared as a global pandemic, governments all around the world have taken strict public health measures to contain the outbreak and yield in the least numbers of mortalities possible. Entire countries have been put under lockdown, where all public and private institutions have halted their activities and higher educational institutions have been forced to discontinue face to face teaching experiences. Therefore, with the widespread transmission of the virus between countries and even continents, and the

institutional closure have resulted in more than 80% of students all over the world not going to their universities and colleges.¹ It is expected that even after the epidemic is finally put under containment, the effects of the dangerous novel coronavirus "COVID-19" would undoubtedly resound through international higher education institutions.

Currently, universities face the risk of missing a whole term, or more, in the most distressed regions, where the quarantine period, the fate of the students, and the academic year are still undetermined. Several universities have shortened spring vacations to postpone students' return to campus so that university

administration may have ample flexibility to brace for a possible health care disaster and enforce measures for infection prevention and control. Many institutions canceled all activities, switched to online courses, or early terminated their term.²

In light of this situation, higher education institutions in Lebanon have been compelled to employ alternative instructional methods that might bridge the gap during these difficult times. Therefore, online learning or e-learning platforms have been put into use to simulate a virtual classroom in which the instructor and the student can interact and fulfill the learning outcomes of the curriculum remotely. Platforms, such as Zoom, Moodle, Blackboard, and Skype have been employed to deliver the content to the students, where faculty members have been challenged to make themselves familiar with new methods of teaching.³

In the past 20 years, there has been considerable research concerning online learning in higher educational institutions, where full courses to even full bachelor and masters programs have started to be delivered through online platforms. However, students who are enrolled in full instruction based programs and are not familiar with such experience were faced with a system shock.⁴

Although the preliminary digital transition generated a burst of confusion, an online class has advantages in quarantine times where students can still benefit from catching up on their courses. Yet, the reality is that certain topics are much more challenging to deliver online, especially those which entail practical or even clinical aspects in majors that relate to the health sciences for example.⁵

There are a plethora of factors that explain how university students can face specific difficulties and limitations through e-learning and thus placing them in a stressful learning experience.^{6,7} University students are characteristically susceptible to developing stress disorder and depression and the possibilities of such implications are expected to grow in the times of COVID-19 quarantine due to the psychologically challenges conditions that they are faced with every day.⁸ Such students will lack vital incentives for their progression in their education or career. During quarantine, social isolation and reduced activity can intensify procrastination and feelings of worthlessness. The conditions may exacerbate anxiety and depression understandably. The screen produces an intense isolation that makes it challenging for many individuals to engage in back-and-forth conversation so it is almost hard to have constructive input without looking like you're talking through a vacuum.⁹ Financial barriers can also impede their access to technologies that shall be used in order for them to keep up with their learning online.¹⁰ In Lebanon, infrastructural factors, such as the electricity and telecommunication deficit have been reported to be a significant barrier to e-learning.

Lebanese students are being faced with quite a unique reality where the economic, political and health circumstances are posing strenuous challenges to their social stability and therefore their professional development. However no research has been presented previously that examines the Lebanese students experience with strictly exclusive e-learning during the times of pandemic and economic recession. Therefore, this study aims at evaluating the

prevalence of depression, anxiety, and stress symptomatology among Lebanese university students during the COVID-19 quarantine.

2 | MATERIALS AND METHODS

This study paper adopted a quantitative cross-sectional research design, where an electronic survey has been sent to quarantined university students via email to fulfill. The study sample included 520 undergraduate university students from the four provinces of Lebanon, where they were included in the study based on that they have abided by home quarantine that was devised by the Ministry of Public Health in Lebanon and have been participating in exclusively online learning activities in line with their respective curricula. Home quarantine in Lebanon means that individuals can only go out for extreme need, such as going to the supermarket or pharmacy, they are subject to curfew hours from 7 p.m. to 5 a.m. of every day and can only use their private cars on predetermined dates, where law enforcement forces have been deemed responsible to oversee the implementation of the partial embargo. The online learning activities comprised of receiving instruction and delivering course requirements, such as assignments, presentations, reports, and exams via digital platforms, such as Zoom or Blackboard or any other online portals to meet their curricular demands.

The survey was sent to 613 eligible respondents on April 20, 2020, where they have been reminded one week after that date to fill the questionnaire, and it had received a response rate of 84.4%. The students were contacted via email, where they have received an explanation of the research purpose and were required to send back a written informed consent. The research has fulfilled the ethical guidelines requirements and therefore Institutional Review Board was acquired from the university from which data was collected (IRB number: ECO-R-27). In the email containing the link for the questionnaire the students were briefed about the aim of the research study, and they have been informed that all the data that would be collected will be unidentified, anonymous, and confidential as access to the data will be only granted to the researcher, noting that taking part in the study is voluntary, and they can pull out of the study at any time with no consequences. The questionnaire included a sociodemographic data sheet which included a question regarding their satisfaction with the e-learning experience during COVID-19 quarantine. The second section of the survey comprised of the depression, anxiety and stress scale-21 (DASS-21) questionnaire, which evaluated the psychological impressions of the students, highlighting symptoms of depression and anxiety which were tackled in the 21-item DASS Checklist.¹¹ The DASS-21 is a collection of three self-reported indicators intended to assess depression, anxiety, and stress. There are seven elements in each of the three DASS-21 scales, categorized into subscales of related information. The respondents rated their answers on a continuous scale from 0 (did not apply to me at all) to 3 (applied to me very much or most of the time), where total DASS-21 scores would range from 17 to 85, and subscales were computed by summing the questions relating to each dimension.

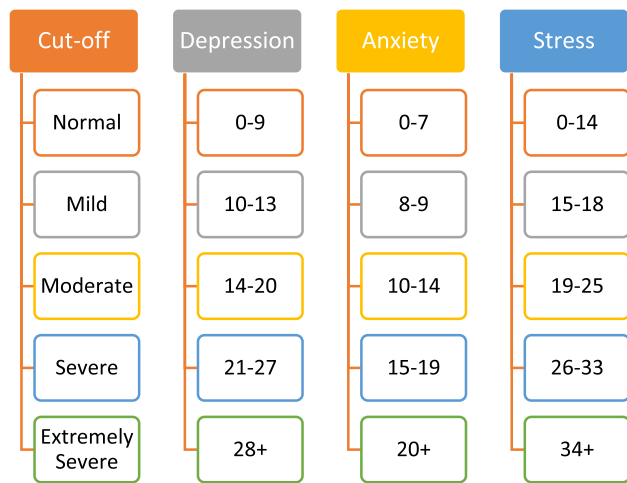


FIGURE 1 Cut-off points of DASS-21 dimensions. DASS-21, depression, anxiety and stress scale-21 [Color figure can be viewed at wileyonlinelibrary.com]

Cut-off points were assigned for each dimension of the DASS-21, to critically evaluate the prevalent levels of either, depression, anxiety or stress symptoms according to Lovibond and Lovibond (1995). The cut off points are delineated in the Figure 1. DASS-21 has been verified for use among various populations, where the results indicate that the DASS-21 has strong reliability and validity and is psychometrically accurate.¹² The data after that was entered into SPSS version 22 for analysis where descriptive and inferential statistics was carried out.

3 | RESULTS

3.1 | Sociodemographic data

The sample comprised of 520 undergraduate university students, where 201 (38.7%) were males while 319 (61.3%) were females. The age of the students ranged between 18 and 36 years where the mean age of the students was 21.03 years (± 2.66) (Table 1).

3.2 | Satisfaction with online learning during COVID-19 quarantine

Descriptive analysis was carried out to evaluate the students' satisfaction with the online learning experience during the

TABLE 1 Sociodemographic data

		N	%
Gender	Male	201	38.7
	Female	319	61.3
Age	Min-max	Mean	SD
	18–36 years	21.03	2.66

COVID-19 pandemic quarantine. The results showed that in total, almost half of the sample and namely 253 (48.65%) of the students were dissatisfied with the experience, 147 (28.3%) were neutral and only 120 (23.1%) of the students surveyed were satisfied with e-learning (Table 2).

3.3 | Depression, anxiety, and stress scale

Further descriptive analysis was carried out to evaluate the prevalence of depression, anxiety, and stress using the DASS-21 survey. The results showed that on the level of depression the students scored a mean of 7.67 (± 5.58), while on the level of the anxiety dimension the students scored a mean 7.25 (± 4.74) and finally on the level of the stress dimension, the students scored a mean of 8.37 (± 5.11) (Table 3).

The three DASS-21 dimensions were evaluated according to the previously mentioned cut-off points, where certain scores are indicative of varying levels of depression, stress or anxiety symptoms. The results of the descriptive analysis showed that 93 (17.9%) of the students had mild depressive symptoms, while 72 (13.8%) had moderate and 9 (1.7%) had severe depressive symptoms. In addition, the analysis indicated that 69 (3.3%) of the students had mild anxiety symptomatology, 114 (21.9%) had moderate, 33 (6.3%) had severe and 12 (2.3%) had extremely severe anxiety symptoms. Further, 57 (11%) of the students had mild stress while 9 (1.7%) had moderate stress (Table 4).

3.4 | Difference in student's satisfaction with online learning according to student characteristics

An independent *t* test was carried out to determine the difference between males and females according to satisfaction with online learning. The results showed no difference in satisfaction according to gender; however a significant difference between ages was regarded ($p = 0.00$) (Table 5).

3.5 | Difference in depression, anxiety, and stress scale according to student characteristics

An independent *t* test was carried out to determine the difference between males and females according to the recorded levels of

TABLE 2 Satisfaction with online learning during COVID-19

	N	%
Very dissatisfied	87	16.7
Dissatisfied	166	31.9
Neutral	147	28.3
Satisfied	120	23.1

Abbreviation: COVID-19, coronavirus disease 2019.

TABLE 3 Depression, anxiety, and stress scale

	Minimum	Maximum	Mean	SD
Depression	0	21	7.67	5.58
Anxiety	1	21	7.25	4.74
Stress	0	21	8.37	5.11

TABLE 4 Depression, anxiety, and stress levels

N	Depression		Anxiety		Stress	
	%	N	%	N	%	N
Normal	346	66.5	292	56.2	454	87.3
Mild	93	17.9	69	13.3	57	11.0
Moderate	72	13.8	114	21.9	9	1.7
Severe	9	1.7	33	6.3	0	0
Extremely severe	0	0	12	2.3	0	0

TABLE 5 Difference in students satisfaction with online learning according to student characteristics

		t	Mean	SD	p Value
Student satisfaction	Male	-1.23	2.51	1.03	0.66
	Female	-1.22	2.62	1.01	
		df	M	F	p Value
Student satisfaction	Between groups	12	3.94	4.05	0.00
	Within groups	507	0.97		

Note: Bold values are statistically significance $p < 0.05$.

depression, anxiety, and stress symptoms. The results showed that there was a significant difference between males and females on the level of stress where females recorded higher means of stress ($p = 0.00$). An analysis of variance test was carried out to determine the difference on the level of the three DAS dimensions according to age and the results have shown significant differences on the level of stress ($p = 0.00$), anxiety ($p = 0.0$), and depression ($p = 0.00$) (Table 6).

3.6 | Relationship between student satisfaction and depression, anxiety, and stress scale

A bivariate correlational analysis was carried out to determine if there is a relationship between student satisfaction with e-learning and depression, anxiety and stress scale. The results showed a highly significant negative relationship between the mentioned variables where they have all scored p value of $p = 0.00$ (Table 7).

TABLE 6 Difference in depression, anxiety, and stress scale according to student characteristics

		t	Mean	SD	p Value
Stress	Male	-3.90	1.06	0.24	0.00
	Female	-4.46	1.20	0.46	
Anxiety	Male	0.93	1.91	1.08	0.87
	Female	0.94	1.82	1.12	
Depression	Male	-0.01	1.51	0.72	0.08
	Female	-0.01	1.51	0.84	
		df	M	F	p Value
Stress	Between groups	12.00	0.68	4.67	0.00
	Within groups	507.00	0.15		
Anxiety	Between groups	12.00	5.28	4.68	0.00
	Within groups	507.00	1.13		
Depression	Between groups	12.00	3.44	6.09	0.00
	Within groups	507.00	0.57		

Note: Bold values are statistically significance $p < 0.05$.

TABLE 7 Relationship between student satisfaction and depression, anxiety, and stress

		Depression	Anxiety	Stress
Student satisfaction	R value	-0.30	-0.24	-0.27
	p Value	0.00	0.00	0.00

Note: Bold values are statistically significance $p < 0.05$.

3.7 | Student satisfaction predictor of depression, anxiety, and stress

Further, regression analysis was carried out and the results showed that student satisfaction with the online learning experience is a significant predictor of determine the prevalence of depressive symptoms ($p = 0.00$), anxiety symptoms ($p = 0.00$), and stress symptoms ($p = 0.00$) (Table 8).

4 | DISCUSSION

For the past 2 months at least, university students all around the world have been under lockdown due to the international phenomena of COVID-19. This shutdown has stimulated the growth of the virtual learning spaces within such establishments in order not to interrupt learning. The coronavirus outbreak has challenged the readiness of the global educational systems to cope with disasters that demand electronic and remote operation.

The results of this study have indicated that the sudden shift to exclusive online instruction and learning methods have rendered the students dissatisfied with their learning experience. This was explained by previous studies carried out by Beqiri et al.¹³ and Price¹⁴

TABLE 8 Predictors of depression, anxiety, and stress symptomatology

	<i>B</i>	Standard error	Beta	<i>T</i>	<i>p</i> Value
Depression	11.97	0.63	−0.30	18.85	0.00
Anxiety	10.13	0.54	−0.024	18.45	0.00
Stress	11.92	0.58	−0.27	20.33	0.00

Note: Bold values are statistically significance $p < 0.05$.

which highlighted the significance of the assessments and expectations of the students as being related to satisfaction whereby the more learners enjoyed the course, thought it was necessary, became more acquainted with online classes and eventually believed that the course achieved its targets, the more pleased the participants were with online learning methodology.^{13,14} One of the main reasons that might have influenced the dissatisfaction with online learning can be technological difficulties where the telecommunication infrastructure in Lebanon is proven to be below average and connection can break down during a class where students to leave and then relog into sessions, lose data, and not to mention the power outage schedule which can render the students unable to even catch the classes or even their exams online. This is consistent with Kasse and Balunywa¹⁵ disclosed significant structural vulnerabilities; in specific, the lack of internet access, technological ineptitude, and behavioral difficulties that restricted the full-scale implementation of e-learning in Uganda's higher education organizations.¹⁶ In Kenya, insufficient preparation and intense workloads were described by Odhiambo and Acosta¹⁷ as the key factors that made professors put so much focus on posting educational content to e-learning sites as opposed to actual online instruction.¹⁷ These findings can also be corroborated by numerous reports, which indicated that one of the problems confronting information and communication technologies and the online learning system is Internet consumption and accessibility to digital technology. Olaniran and Agnello¹⁸ reported that the expense of Internet connectivity and the World Wide Web prohibits students from navigating the e-learning program.¹⁸ Thus, a so-called digital divide is also described in academia as the diversity between students according to their ability to access the required technologies for online engagement.¹⁹ Furthermore, as per Warschauer,²⁰ the digital divide is dictated not only by material access to computers and telecommunications, but also by access to additional services that can contribute to greater access to the resources.

The results of the study have shown that the majority of the students did not report psychological symptoms, yet the situation have started to give rise to moderate levels of anxiety and depressive symptomatology among the students, where a significant relationship was found between the students' satisfaction with online learning and the prevalence of depression, anxiety, and stress symptoms, where satisfaction was also found to be a predictor. In a recent report, students proclaimed that they receive loads of emails every day, a lot of assignments and requirements to cover which

makes day to day living very stressful to deal with the heavy workload.²¹ In addition, a very recent report that has been also issued during the times of COVID-19 have emphasized the higher need for psychological counseling of students due to the increased levels of stress and moral distress of generation z students as a result of the drastic change in the learning environment and the future prospects of their careers.²² Also a recent paper have examined the stress on the students in accessing campus platforms due to high load of traffic and have shown that such a load posed a challenge for e-learning thus causing frustration among students to hand in requirements on time due to system crashes and thus contributing to more stressors.²³ Various previous studies have proven that student satisfaction with the learning process has significant relationship with the learning outcome, therefore the consequences of e-learning might affect the students' progress and academic achievement.^{24,25}

5 | LIMITATIONS

This study was conducted via convenient sample among a proportionally small sample, as researchers have not been able to more students from other universities that have been closed due to COVID-19 quarantine, which might have given a richer perspective into the research problem.

6 | CONCLUSION

Due to the global spread of the novel coronavirus, multitudes of academic institutions around the world have been forced to closed its doors and have adopted the use of online teaching and learning methods and employed various clouds and platforms to deliver the required material and attempt to salvage the academic year. This sudden leap in the method of instruction have impeded the students learning and caused stressful loads of work which started to give rise to anxiety and depressive symptomatology among undergraduate students.

7 | RECOMMENDATIONS

Academics are called upon to simulate and research certain scenarios in an attempt to create a suitable algorithm of action which, educational institutions might be able to adopt in case similar circumstances have risen again. Thus producing evidence based actions which would be able to reduce repercussions of university closure and shifts in educational strategies, enhance students' satisfaction and academic achievement as well as safeguard their health is recommended. Moreover, a subsequent qualitative research is recommended to profoundly evaluate the challenges that have been faced by undergraduate students while studying via e-learning techniques. The authors also recommend repeating this study on a wider national, regional, and international scale.

ACKNOWLEDGMENTS

The authors would like to acknowledge the efforts of the research assistant who helped in the data collection and publishing of this paper.

CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

ETHICS STATEMENT

The work described has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans; Uniform Requirements for manuscripts submitted to Biomedical journals.

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How to cite this article: Fawaz M, Samaha A. E-learning: Depression, anxiety, and stress symptomatology among Lebanese university students during COVID-19 quarantine. *Nurs Forum*. 2021;56:52–57. <https://doi.org/10.1111/nuf.12521>