Manage Awareness Attitude Anxiety Experience and E-learning during COVID-19 Pandemic Evidence from ASU University

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Abstract

A statistical study was conducted on the impact of the global epidemic of the COVID-19 virus on undergraduate students at the Applied Science Private University in Jordan. The items were divided into five main items; the general knowledge of the epidemic, information among students from a scientific perspective, the impact of the epidemic on psychological and physical health, the impact on academic achievement, and the future expectations. The total number of students was 361 students. The results among the items were positive except for the effect on academic achievement, which was negative. The difference in outcomes between males and females was slight, also, between colleges. However, the difference was clear between the school years, it was found that the higher the student in the academic year, the more cognitive analyzes and awareness of this epidemic. The study found that students had a medium to a high level of anxiety, and the majority of information on this epidemic was obtained by students from social media and not from official authorities. An effective partnership of governments and their educational institutions is must ensure limiting the spread of disease and finding accurate scientific methods to contain problems that arisein society to ensure prosperity.

Keywords: *Education, GPA, Anxiety, COVID- 19, prosperity, partnership, E-learning.*

Introduction

During the pandemic, most of the educated people and health professionals are aware of this infection, possible preventive measures and the importance of social distancing [(1)] The WHO advised measures; first avoiding close contact with persons suffering from acute respiratory infections, second frequent hand-washing mainly after direct contact with ill people or their environment, and infected people must practice cough protocol (to maintain distance, cover coughs and sneezes with disposable tissues or clothing and wash hands) [(1,2)].

The world wide web (Internet sites, social media) is the main source of information for the global in this pandemic. Even though the improvement of internet communication expands the accessibility and broadcasting of knowledge, it also has the possibility for the growth and spread of propaganda or fake news. Governments should be responsible for providing accurate information and clarifying misinformation to help the public facing this pandemic [(2)].

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Countries around the world are struggling to stop the spread of the COVID-19 pandemic in several steps; including a total or partial ban and prevent travel between countries. The continuous spread of the epidemic (strict isolation measures) workflow malfunctionin schools, colleges, and universities [3,4].

To reduce the spread of COVID-19, many universities have suspended any on-campus activities, classes are being held online [5]. Across the country it is expected to influence the mental health of college students [3,4]

Although it seems that old age increases the risk of COVID-19-related infection and mortality [6,7], many researchers found that the anxiety level is significantly higher in 21–40 age groups comparing to the older ages, which is due to the concern about the future and economic consequences [4,6–8].

Cao et al showed that about 24.9% of college students have suffered anxiety in COVID-19 outbreak. The COVID-19- related stressors including economic stressors, effects on daily-life, and academic delays [3,4]. The mental health of college students is considerably affected, they require attention, and support. It is suggested that universities should collaborate to resolve this dilemma [3].

The closing of the educational institutions affected more than 70% of the world's student population. Consequently, all teaching activities, suddenly, had to be moved within virtual settings. The exchange from physical to virtual have been quite fast. This situation can be considered, in fact, a unique experiment, because without the COVID-19 pandemic it would not be ever possible to force institutions, professors and students to swap in a so short time [9]

The aim of this study is to measure the awareness of the Applied Science Private University ASU in Jordan students on the COVID-19 pandemic, their worries, and their point of view on the e-learning process.

What is e-learning?

The rapid development in computer technologies and software, the increasing impact of the internet on our lives and using different teaching applications and platforms have affected the learning process. That shows that teachers and students recently have started to depend heavily on using PowerPoint files, PDF files and emails to share notes, homework and sometimes doing online exams.

E- Learning is a broad concept that may include many aspects of teaching and learning activities using technology based- e-learning, for example: computers and web-based platforms. This kind of activity could be distance learning or face-to-face learning in classes. It has been discussed that this term does not have a common definition [10]. E- Learning may be referred to as virtual learning, digital learning or web-based learning. It could be used partially as part of the traditional teaching/learning process or completely, depending on the material delivered to students [11]. Therefore, e-Learning can be of several kinds that involve three types depending on the range of interaction abilities as shown in table1.

Table 1: Types of e- learning depending on their interactive capabilities[11]

Type of E-Learning	Example
E-learning process with low interactive use, which mainly consist of texts or multimedia materials.	1. power point presentations 2. e-books 3. videos or audio podcasts
E-learning process with moderate interactive capabilities	1. quizzes with feedback, 2. interactive resources 3. learning by using simulators or demonstrations
E-learning process with high interactive capabilities	1. virtual classrooms 2. video conferencing 3. streaming medias 4. online blogs, Wikipedia or social media groups

Academically, e-learning is characterized by using multimediawhich made this process more active and

interesting,depending on the speed, quality and the cost of such multimedia constructs. According to Borstorff and Lowe(2007), e-learning is flexible, meaning that students at higher educational levels can go throughout the learning process focusing on different objectives, whether they are personal, educational or career goals at the same time, because they do not have to be restricted to rigorous schedules[12].

Algahtani, (2011) proposed three models of use of e-learning: adjunct, blended and online. The adjunct e-learning means that e-learning is used as an assistant method next to the traditional ones used in the classroom. In the case of blended e-learning, or sometimes called the hybrid learning, the e-learning strategies are totally essential in the learning process, that is the delivering the teaching material depends on e-learning methods, shared between traditional ways of teaching in the classroom. The third type is totally online, without classroom participation. The third type is totally online, without classroom participation[13].

Advantages and disadvantages:

Recently, e-learning is considered as one of the best learning methods, specifically in higher education [13–15]. There are many benefits of such method: flexibility related to time and place: that students have the freedom to choose when and where to learn using technology. Secondly, in some cases, students are able to enhance communication using forums and discussion groups to exchange different views. Another advantage of e-learning is that it facilitates learning from distance, that many students can learn without the need to travel abroad as well as it enables to have the maximum number of students without the need for more expenses and facilities. However, other researchers argue that e-learning also has a negative impact on the learning process[10]. One of the most noticeable disadvantages of e-learning is the absence of the personal interaction among teachers and students on one hand and among students on the other. Thus, younger learners, school students, find it very difficult to handle such method of learning. Doing exams online is considered as a disadvantage of e-learning, because many academic subjects cannot be tested using a multiple-choice questions or short answer questions. Some subjects need an essay writing or short paragraphs, which might be found difficult by the majority of students to be done online.in addition to that, those exams might be misled to plagiarism and piracy which will cause a lot of harm for the learning process. For scientific fields, e-learning is considered inadequate because they are learned through practice.

Anxiety of COVID-19:

With the drastic outbreak of COVID-19 worldwide, to cope with the virus, governments around the world have carried out severe measurements to reduce the number of the infected cases such as: quarantine lasting for weeks, immediate lockdowns, mobility of people through airports, seaports and land ports is controlled with critical procedures, as well as social distancing is encouraged. Students and teachers around the world are also affected with the epidemic situation. Little attention was paid for the side effects of closing academic institutions and how that led to many serious problems with students.

Since there has been several waves of COVID-19, most research has been conducted on vaccines and recovery procedures, whereas little research has been directed to the coping strategies should be followed by academic staff and students. With the beginning of the first wave, most college students faced a lot of problems with distance learning, because the majority of college teacher depend on the traditional methods of teaching. They faced difficulties with adapting distance learning, therefore they depended more on sending PPT files and PDF documents via the electronic platforms. Moreover, the weakness of the internet network is considered as another major problem for both college students who stayed at home or in the dormitory during the lockdown. It has been suggested that closing the academic institutions left a huge negative impact and feelings of anxietythreatening the mental health of students, as a result that affected their academic performance negatively [16].

Recently, many researchers have conducted several studies about the impact of COVID-19 over the overall achievement of students. Nurunnabi et al (2020) conducted a study, related to the coping strategies by higher education students in China during the virus

spreading and the continuous lockdown of universities, through an online questionnaire that included questions about students' lives and feelings of anxiety during the pandemic. The sample included 559 responses. To measure the relationship between the strategies those students followed to control anxiety levels, the researchers used ANOVA procedure, and SPSS statistics v27 was used for statistical analysis. The results showed that students suffered from lack of sleep and psychological problems such as the need for emotional and mental support.

Alyamiet al (2020) attempted to measure the rates of anxiety and depression among individuals in Saudi Arabia during COVID-19, using the Patient Health questionnaire (PHQ-9) and Generalized Anxiety Disorder-7 (GAD-7)[17]. The finding illustrated that the percentage of the spreading of depression and anxiety among the participants was 9.4% and 7.3%. Participants were categorized into two groups: Saudi individuals and non- Saudi individuals. The findings showed that the first group including married, unemployed and those with high income faced higher risk of anxiety and depression. On the other hand, non-Saudi residents (university students, divorced, retired and 50 years old and above) were at higher risk to suffer from anxiety and mental illness[17].

Another research has been conducted by Sundarasen et al (2020) about the effect of COVID-19 on the anxiety levels of university students in Malaysia, using Zung's self-rating anxiety online questionnaire including 983 respondents. The results showed that 20% of the respondents suffered from a minimal level of anxiety, whereas 2.8% only had severe levels of anxiety[18]. Age, gender and academic major are related to the levels of anxiety students suffered from. The main stressors the respondents reported are: financial problems, online learning and their academic performance. A similar study about university students in Bangladesh by Islam et al (2020) including 476 students using a cross-sectional online survey. The questionnaire was build using Google Forms and shared on Facebook. Data were categorized into three levels: univariate, bivariate, and multivariate analysis. The finding illustrated that the majority of the students suffered from different levels of depression: minimal, moderate and severe. Another result clarified that older students had greater level of anxiety and depression[19].

The aim of this study is to measure the awareness of the Applied Science Private University ASU in Jordan students on the COVID-19 pandemic, their worries, and their point of view on the e-learning process.

Method

A. Participants

This cross-sectional survey was conducted from the 10th of May 2020 to 30th of May 2020. At Applied Private University in Amman/ Jordan. A total of 361 were recruited to the study, more than 50% were aged 20-22 years, 202 (56.0%) are males. 97(26.9%) studies in the faculty of Arts and Science. Nearly one third of the sample are in their first year and 101(28.0%) have cumulative average of ≥ 84.

B. Constructs of the study

To measure levels of awareness of anxiety of university students in the Hashemite Kingdom of Jordan, specifically ASU, five categories are used as the main structure to gather data from students: i. knowledge about the Corona virus, ii. Awareness of viruses in a chemical or biological fashion, iii. Impact of measures to protect against the spread of the epidemic on physical and mental health, iv. Impact of measures to protect against the spread of the epidemic on academic achievement, v. Future developments from the spread of Corona virus. Each category includes several variable: age, gender and university specialization.

C. Statistical analysis

Knowledge scores, attitudes and practices of different persons according to demographic characteristics were compared with independent- samples t-test and the one-way analysis of variance (ANOVA) also is calculated. The reliability coefficient (Cronbach's Alpha) of the study is 0.744. Multivariable linear regression analysis using all the demographic variables as independent variables and knowledge score as the outcome variable was conducted to identify factors associated with knowledge. Similarly, binary logistic regression

analyses were used to identify factors associated with attitudes and practices. Factors were selected with a backward stepwise method. Unstandardized regression coefficients (β) and odds ratios (ORs) and their 95% confidence intervals (CIs) were used to quantify the associations between variables and KAP. Data analyses were conducted with SPSS version 17.0. The statistical significance level was set at $p < 0.05$ (two-sided).

Results

A. Sample description

A total of 361 were recruited to the study, a little more than half of them aged 20-22 years, 202 (56.0%) are males. 97(26.9%) studies in the faculty of Arts and Science. Nearly one third of the sample are in their first year and 101(28.0%) have cumulative average of ≥ 84. Majority of the sample have their information about Covid-19 from multimedia.

B. Reliability coefficient

The reliability coefficient (Cronbach's Alpha) of the study is 0.744, which is a good value reflecting a reliable measure of the study tool.

C. Study of items' means

The following part shows responses to the levels of the variables. Here, mean and standard deviation are calculated for each item then they are ranked in descending order according to mean. Higher mean value indicates more agreement on that item.

i. knowledge about the Corona virus

"In your view, it is considered one of the fastest spreading viruses" has the highest mean value of 4.62(SD=0.66) with 'strongly agree' attitude. In the second rank is item 3 "In your view, the best way to protect against it is social separation" with mean 4.44(SD=0.81) with 'strongly agree' attitude. Item 1 " In your view, this virus is dangerous and deadly" has the lowest mean with 3.65(SD=1.04) with 'agree' attitude. In general, knowledge about Corona virus is of 'strongly agree' attitude with mean 4.21(SD=0.61).

ii. Awareness of viruses in a chemical or biological fashion

"Water and soap kill viruses by destroying their vital membranes" has the highest mean of 3.76(SD=0.96) with attitude of 'agree'. In the second rank is item 2 "Viruses can only reproduce within the organism" with mean 3.70(SD=1.15). The minimum mean is for item 5 "Alcohol sterilizers are less efficient than soap for killing virus" with only 2.60(SD=1.15). In general, Awareness of viruses in a chemical or biological fashion is of 'agree' attitude with mean 3.42(SD=0.62).

iii. Impact of measures to protect against the spread of the epidemic on physical and mental health

"The current procedures affected your sleep disorder" with mean 4.38(SD=0.97), while item 2 "The current procedures have affected your lack of movement" is in the second rank with mean of 4.20(SD=0.96) both with 'strongly agree' attitude. Item 1 "The current procedures affected your weight gain" has the lowest mean of 3.10(SD=1.35) with 'neutral' attitude. In general, impact of measures to protect against the spread of the epidemic on physical and mental health has a mean of 3.77(SD=0.77) with 'agree' attitude**.**

iv. Impact of measures to protect against the spread of the epidemic on academic achievement

Studying using e-learning is convenient" has the highest mean of 2.78(SD=1.43) with 'neutral' attitude. All other items in this construct are of 'disagree' attitude where item 3 "From your viewpoint, studying using e-learning is provided with the same quality as direct education" has the lowest mean among all items of the study with only 1.97(SD=1.21). In general, impact of measures to protect against the spread of the epidemic on academic achievement is of 'disagree' attitude and has a mean of 2.42(SD=1.07)

v. Future developments from the spread of Corona virus

Cooperation between individuals and official bodies is necessary to ensure success in ending this disease" has the highest mean of 4.63(SD=0.68) which is in fact the highest among all items of the study. Item 4 "In your view, the preventive measures must be continued for a period of time to ensure protection for individuals" is in the second place with mean of 4.40(SD=0.91). Both

item 4 and 5 have an attitude of 'strongly agree'. All other items are of 'agree' attitude with item 2 "In your view, I feel that public life will return as it was before" is last with mean of 3.60(SD=1.17). In general, Future developments from the spread of Corona virus is of 'agree' attitude with mean of 4.09(SD=0.58).

vi. Summary

Table 2 General mean, standard deviation, and attitude for all constructs of the study

No.	Construct	Mean	SD	Attitude
A	knowledge about the Corona virus	4.21	0.61	strongly agree
B	Awareness of viruses in a chemical or biological fashion	3.42	0.62	agree
C	Impact of measures to protect against the spread of the epidemic on physical and mental health	3.77	0.77	agree
D	Impact of measures to protect against the spread of the epidemic on academic achievement	2.42	1.07	disagree
E	Future developments from the spread of Corona virus	4.09	0.58	agree

From table 2, construct A "knowledge about theCorona virus" has the highest general mean of 4.21 with 'strongly agree'. In the second rank is construct E "Future developments from the spread of Corona virus" with general mean of 4.09 and an attitude of 'agree'. On the other hand, construct D has the lowest general mean of 2.42 and an attitude of 'disagree'.

D. Correlation analysis

All relations are positively significant except for the relation of D "Impact of measures to protect against the spread of the epidemic on academic achievement" with E "Future developments from the spread of Corona virus" which is non-significant (r=0.069) and the relation of construct C "Impact of measures to protect against the spread of the epidemic on physical and mental health" with construct D "Impact of measures to protect against the spread of the epidemic on academic achievement" which is negative (r=-0.199).

The strongest relation is between construct A "knowledge about the Corona virus" and construct E "Future developments from the spread of Corona virus" (r=0.454) which is a moderate value. The second strongest relation is between construct A "knowledge about the Corona virus" and construct B "Awareness of viruses in a chemical or biological fashion" (r=0.364) which is relatively weak value.

Table 3 Pearson's correlation coefficients

Construct	A	B	C	D	E
A	1	0.364*	0.164*	0.190*	0.454
B	0.364*	1	0.173*	0.188*	0.239*
C	0.164*	0.173*	1	-0.199*	0.185*
D	0.190*	0.188*	-0.199*	1	0.069
E	0.454*	0.239*	0.185*	0.069	1

E. T tests and Analysis of variance

Are there significant differences in the levels of the study constructs that can be attributed to age, gender, faculty, class, cumulative average and information source. Independent samples t-test will be used to test for gender while, analysis of variance (ANOVA) will be used to test for other personal variables. **Gender, Age, Faculty, Class, Cumulative average and Information source**

Discussion

The COVID-19 is the most prevalent among the viruses around us and this has been proven in a number of researches [2,6,20], because of the rapid spread of

this disease, many people have fear of infection. This epidemic of international concern is a public health emergency and postures a challenge to psychological resilience [8].

Several studies aimed to understand the levels of psychological impact, anxiety, depression, and stress during the COVID-19 outbreak [8] Wang et al. found that female gender, student status, have physical symptoms associated with higher levels of stress, anxiety, and depression in the outbreak [8]. Ahmad et al. mentioned that 29 % of respondents are suffering from different forms of anxiety due to lockdown in the outbreak [21]

Most of the information was obtained from the means of communication. Governments and health authorities need to provide accurate health information during the epidemic to reduce the impact of rumors[8,21]. Higher health information received is associated with lower levels of stress, anxiety, and depression [4,8,22]. The content of health information needs to be based on evidence to avoid adverse psychological reactions. Wang et al. results showed that accurate health information was associated with lower stress levels [8].

Wang et al. reported that the Internet with 93.5% was the primary health information channel for the public during the COVID-19 epidemic in China, while >70% of respondents were satisfied with the amount of health information available [8].

Accordingly, it is preferred for individuals to obtain various methods of prevention. Studies have been conducted in the social spacing of the best method, which was agreed with the results of the questionnaire. Whereas, the participants considered that the method of prohibition (one of the formal methods that it adopted) is a strict method for solving this crisis and that sterilization is less important compared to the social divergence.

The highest arithmetic mean was the rapid spread of the virus that the participants considered the most prevalent and appended to it that the best way to protect against infection is social spacing. The lowest mean was for the serious and fatality of the disease.

The highest percentage of respondents was from first-year students. Students have sufficient awareness of the nature of viruses, as the highest average arithmetic was about the principle of the action of water and soap in destroying the biological membrane of the virus, which helps greatly to get rid of it on surfaces, and the efficiency of removal with water and soap is much more than the use of sterilizers.

The highest mean arithmetic relative to the impact of the pandemic on students 'health and psychological state was sleep disturbance, followed by reduced mobility. Moderate value. It was thus regarding consideration and frustration about the pandemic with a moderate mean.

On the question about the efficiency of e-learning compared to direct education for students, the answer was in general about dissatisfaction with the method, where the burden for students was more and more evaluation is more difficult and unpleasant.

Hasan found that 89% of the respondents agreed that online education is the alternative measure for conversational in-class teaching and learning for future occurrences of any pandemic [5] and slightly more than 70% agree that the swap to distance education did not increase their working load. In Fact, some of them feel that they are affording time that usually spent in commuting and/or in waiting for lectures due to a not optimized timetable of the face-to-face activities [9]. Also, the technological and educational adequacy of the teachers have been judged positively. Even though the face to face contact with the teacher is still considered very relevant.

Mostly the main reasons to prefer face to face contact are i) the fear about possible malfunctioning of the connection; ii) a possible decrease in attention that could be induced by other concurrent stimuli; iii) the concern about the frigidness of the interaction with the teachers, this despite the familiar comfort offered by connecting from home.

The future expectations of the spread of the virus and the disease were overall among the students based on what was transmitted from the official authorities, where the students agreed that cooperation with the official authorities is the most successful way to control the epidemic. And that the measures remain for a period to set matters while maintaining some optimistic

attitude about the near future of the epidemic. Zhong et al. reported that majority of the participants held an optimistic towards the COVID-19 epidemic [23].

Conclusion

The results showed that the main source of information was the multimedia putting in concern that the public should seek the correct information from the most reliable source.

There was no significant difference in the means between gender and faculty, meanwhile, the class (academic year) showed a significant difference. the students suffer from anxiety which could go worse as the measures of the ban continues.

The study found that students had a medium to high level of anxiety, the reasons for which were places of poor knowledge of what was happening around them, anxiety associated with academic achievement and also unclear economic conditions for all. The vast majority of information on this epidemic was obtained by students from social media and not from official authorities.

Recommendations

instructing educational institutions (universities) first to find programs to reduce stress among students, where one of the reasons was for the e-learning process, and secondly to establish communication platforms with its students to provide them with fresh and correct information about this epidemic. With the aim of raising awareness for students in general. As the scientific information was somewhat wrong with the students, knowing that the highest percentage of students were from the faculties of science.

It is important to take into account that educational institutions possess scientific and technical capabilities that can significantly help to raise awareness about this epidemic in general and any problem facing countries, especially since the age group that they are affiliated with is the vital and major category of state development. Effective partnership of governments and their educational institutions has a distinctive impact to ensure limiting the spread of disease, and finding accurate scientific methods to contain any problem that arises in society and prosperity.

Declaration of Competing Interest

The authors declare that they have no conflicts of interest to disclose.

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