

Examine and analyze the impact of COVID-19 on the undergraduate learning environment

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Abstract

The Corona crisis has ultimately affected societies, affecting both young and elder and other economic and academic life aspects. The emergence of this crisis prevented millions of students from heading to the study benches, which negatively affected the educational level. Therefore, most countries resorted to quick solutions that were adjusted over time to suit the requirements of the stage. This paper focuses on studying the impact of the Corona crisis on the academic level of students and the rate of interaction with the course material. First, we designed questionnaires to collect data on the impact of the Corona crisis on students in terms of communication and the psychological impact of social distancing and not attending classrooms. The data analysis also helped in finding mathematical models that show the impact of Corona on students. The results of the ANOVA test related to the academic level showed that there is a significant discrepancy between the two samples by 3.925. The (sig.) value is 0.002, confirming a significant difference between the academic level groups and the postgraduate students, who faced more difficulties in studying online with an average of 3.925 compared to diploma level students (3.52). The study also proved that the participants were more aware of following the procedures in dealing with COVID (based on the Sig value of 0.003), and the largest number of female participants was with an average square (14,184). In addition, COVID-19 reduced the contact between relatives based on the Sig value of 0.004.

Keywords: college teaching; student evaluations of teaching; online administration; response rate; assessment



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1. Introduction

Recently, the Covid-19 virus disease has spread all over the world, affecting humans greatly (Haleem et al., 2020). Since Covid-19 is a new type of Coronavirus, as the first case of this virus was discovered on December 31, 2019 in Wuhan, the People's Republic of China (Coronavirus Disease (COVID-19). We conducted a study of how Covid-19 affected the student's educational aspect. This crisis situation requires an emergency response from everyone to save thousands of lives, industries and financial institutions by increasing community awareness and solidarity in support of society to deal with the effects of the current epidemic. The effects that resulted after the emergence of Covid-19 in the Sultanate of Oman, as this pandemic affected the human and economy in reducing the number of jobs and tourists (Yousif et al., 2021a). The social dimensions in Oman have been affected by the Corona epidemic in various categories, including small and medium-sized companies (Al Farsi & Alattar, 2021). And it leads to the closure of places of worship, entertainment, sports and tourism. It also leads to the suspension of education and the exemption of employees from going to the workplace. Also, from the negative effects of Covid-19 on the psychological state of society and their behaviors, by sitting in their homes and not doing outside activities, also the health isolation of the infected causes them to feel lonely, depressed and anxious (Zia et al., 2021). Therefore, we need a specialized study that analyzes and identifies the variables that help in controlling the social, economic and psychological effects on individuals and society. People who are infected with COVID-19 have different effects on people based on the level of symptoms. People that are infected at a slight to moderate level recover without hospitalization. Others with high end up in the hospital due to their inability to breathe properly (Al Rawahi et al., 2022).

The Covid-19 pandemic has expanded in strategic sectors such as the information and technology sectors to overcome this virus, and the learning process is technically complementary (Yousif J, 2011). New technologies in information technology and the virtual environment will also enhance societal awareness by offering methods to prevent COVID-19 and providing free medical and psychological consultations. Covid-19 has caused to close schools and stop in campus teaching; therefore, students and individuals must follow precautions to protect themselves using new teaching methods like online of using a social and telepresence robot (Yousif J., 2021; Yousif M.,2021a; Yousif M.,2021b; Yousif J., 2020; Yousif et al., 2018).

The paper adopted qualitative and quantitative research approach for examining the impact of Covid-19 on Omani society and how to increase awareness among people. It is developed a well-designed questionnaire to collect a needed data to study the impact of COVID-19 on the Omani students (Yousif et al., 2021b). SETs.

2. Literature Review

Many researches were discussed and explored the impact of COVID-19. Blake (Blake & Wadhwa, 2020) discussed and reviewed the 2020 Harvest. The Impact of the Novel Coronavirus on the Economy. As the results showed that this epidemic has led to an increase in the poverty rate, as 88 million people have reached poverty, and a percentage has emerged that women lose their jobs faster than men, and also the percentage of children who suffer poverty. The lack of food security increased more than before as shown in Figure 1.

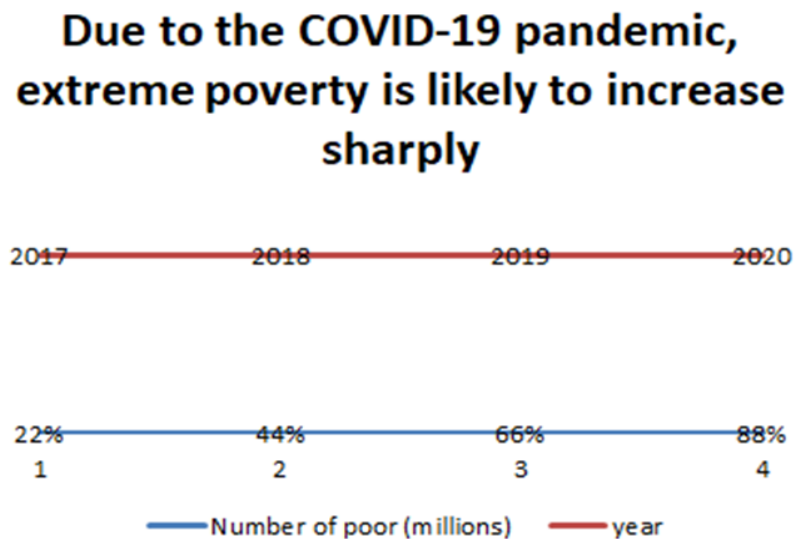


Figure 1: Results source (Blake & Wadhwa, 2020).

The study by Burgess (Burgess & Sievertsen, 2020) discussed and shed light on the problems and impacts facing families and students of COVID-19. This disruption affects students' learning, so they replace it with fewer alternatives and disruptions to internal assessments. And graduates were affected by Covid-19 in terms of poor labor market conditions that led graduates to accept work with lower wages. It also found that an increase in average school hours leads to an increase in average scores in documenters by 6%. The study by Lopez-Leon (Lopez-Leon et al, 2021), performed meta-analyses using metaxyl software to estimate the combined diffusion of 95% CI. Where the prevalence rate showed long-term effects to 55, and 910 patients between 17 and 87 years were included, as results showed that the percentage of patients who had long-term symptoms reached 80% and the most common symptoms were fatigue 58%, headache 44%, disorders. Attention 27%, hair loss 25%.

The study by Owusu-Fordjour (Owusu-Fordjour et al, 2020) deployed a questionnaire on Ghanaian students, this study used a simple technique of random sampling selection of respondents for the study. In light of the Covid-19 period, he discussed the impacts and changes in education that occurred, as it became remote education in order to stop the spread of Covid-19, but there are some developing countries that have been affected more and difficulties due to poverty, such as Ghana, the results showed that there are many Families and parents who do not have a good education, enough to help and educate their children, and a large percentage of students' homes do not have a good internet and a suitable place to learn, and the lack of smart devices for learning for most students, which has formed a problem of poor education in Ghana. The study by Muhammad (Mahdy, M., 2020) examined the impact of the pandemic on students of his veterinary specialization. The number of participants were 1,392 from 92 different nations who answered the questionnaire with a response rate of 94.1%. The results shows that COVID-19 pandemic negativity affected the academic performance of most participants with rate of 96.7%. The mean evaluation score for the participants in the online education was about 5.1 ± 2.4 , but is reduced in the practical parts to be about 3.6 ± 2.6 . Wang (Wang et al., 2020) used data from a network-based poll conducted during the COVID-19 Outbreak (A Network-Based Survey), which received 17,876 responses (72% female, 28% male). In a t-test, one-way ANOVA model, and multiple linear regression model, the PANAS score (positive and negative affect scale) was employed as the dependent variable. The results shows that the spread of Covid affects university and college students, so it must be. Satisfactory response, to reinforce the wonderful guidance of the negative impact and pay attention to improving the positive of university students in facing the epidemic and how to deal with it.

Baloran (Baloran E., 2020) conducted a cross-sectional study and a questionnaire to examine students' knowledge, attitudes, and anxiety during the COVID-19 pandemic for two local private colleges. Non-medical preventive measures were regarded as highly effective. Students were pleased with the government's efforts to address issues.

Table 1: The summary of literature survey

Author/Year	Location	Method	Finding
Paul Blake et al.,2020	United States of America	Harvest 2020 Review	The impact of Covid-19 on the economy and the increase in poverty, the pandemic has pushed another 88 million people into poverty.

Burgess & Sievertsen, 2020	Britain	Analysis of the impact of Covid on students	The effect of Covid 19 on education in schools, universities and families has led to the closure of educational institutions in most countries of the world, and this interruption affects students' learning, so they replaced it with a lower alternative and disturbances in internal assessments. Also, it found that an increase in the average of school hours leads to an increase in the average grades in the documented by 6%.
Lopez-Leon et al, 2021	United States of America	systematic review and meta-analysis	Covid-19 needs to be Diagnosis of a person according to the five accompanying, including: diseases associated with a person previously, the person's immunity, the extent of damage associated with injury, as well as to treat the person, diagnosing period to take caution and raise awareness of others people.
Owusu-Fordjour et al., 2020	Ghana	Descriptive survey with 11 item Likert-scale type of questionnaires.	In light of the Covid-19 period, there have been influences and changes in education, as it has become remote education. There are some developing countries that have been affected more, such as Ghana, many families and parents who do not have a good education, enough to help and teach their children, and also a large percentage of students' homes do not have a good internet and a suitable place to learn, and the lack of smart devices for learning for most students, which constituted a problem of poor education in Ghana.
Wang et al., 2020	China	used network-based survey, 17,876 participants, performed T-test, one- way ANOVA, and multiple linear regression models.	The positive and negative impact and radical changes for school and university students in facing the epidemic and how to deal with it.
Mahdy, M., 2020	Egypt	Used cross-sectional study to analyze the impact of the COVID-19 lockdown on the academic performance of veterinary students and researchers, and an online survey from Google	The results of the research showed a decrease in academic performance scores due to the lack of information on the Internet, the lack of interaction between students and lecturers, the slow speed of the Internet and its cost, Unavailability of clinical preparation application
Baloran E., 2020	Philippines	cross-sectional study conducted among two local private colleges and a questionnaire.	The percentage of students who had knowledge of the disease was 73.58% and knowledge of its primary symptom, which is fever. Students are concerned that the disease will affect students' mental health.

3. Research Methodology

The research is interdisciplinary and includes many activities related to information technology, system and data analysis, and building the virtual reality environment. The paper adopted qualitative and quantitative research approach for examining the impact of Covid-19 on Omani society and how to increase awareness among people. It is developed a well-designed questionnaire to collect a needed data to study the impact of COVID-19 on the Omani.

The research consists of four main stages as follows:

- **Stage 1:** Conduct a literature and related work survey. Literary survey takes great importance in our project because it works to build the entity of scientific research. Through it, the idea of the project can be clarified, as well as the subject of discussion and search for former researchers, and the location of the knowledge deficiency and the attempt to solve it in the correct way by focusing on the proposed methodology and results from several Various sources, information related to our topic is collected through taking some literature works of other researchers, from which their findings are taken and opinions are discussed and given.
- **Stage 2:** Investigate a suitable theoretical and practical solution. And creating an educational interactive solution that helps citizens and students. And also, the theoretical side provides information on Covid-19.
- **Stage 3:** Designing and implementing a well-designed questionnaire to collect the necessary data for the project. We conducted a questionnaire about the impact of Covid 19 on the student and on the study and how to increase awareness with the study for not stopping the study with the safety of the individual in the right way, by providing a questionnaire containing all the questions related to Our topic, which has been published, helps us get the largest number of opinions of people and students that help us understand and know the problems that face them and through it, solutions will be found.
- **Stage 4:** Analyze and discuss the results after appropriate testing and evaluate the data collected using statistical software and SPSS.

4. Results and Discussion

4.1. Questionnaire Design

The questionnaire was designed after analyzing a group of research papers to determine the most important factors and procedures that would help obtain the required information. The questionnaire was designed and published on the web and was sent randomly to a large group of students and researchers. A total of 254 people answered the

questionnaire. Table No. 2 shows the most important descriptive statistical data for the participants in the questionnaire.

Table 2: Descriptive Statistics of data

	N	Minimum	Maximum	Mean		Std. Deviation	Variance	Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error
Nationality:	254	1	2	1.07	.016	.257	.066	9.395	.304
Age:	254	1	4	2.64	.054	.854	.730	-.812	.304
gender:	254	1	2	1.69	.029	.462	.214	-1.302	.304
Academic level:	254	1	6	4.02	.085	1.348	1.818	-.152	.304
marital status:	254	1	5	1.57	.060	.950	.903	3.972	.304
Valid N (listwise)	254								

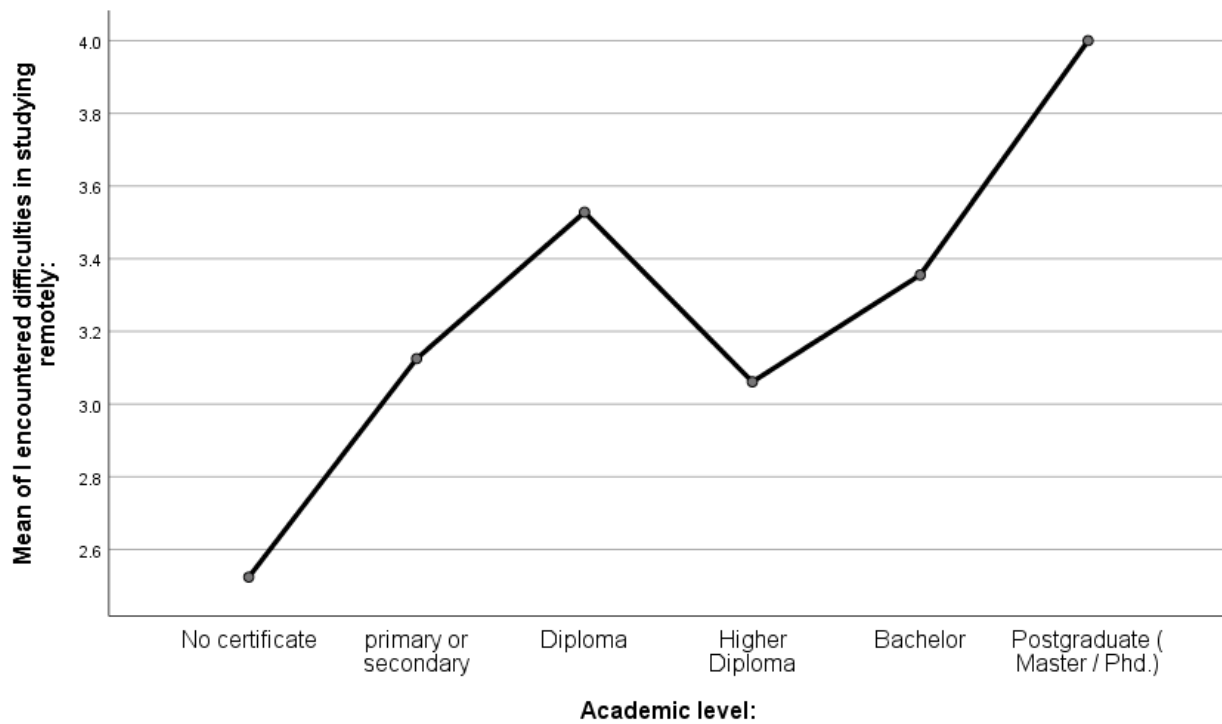
4.2. Questionnaire analysis

Table 3 shows the results of the ANOVA related to academic level, which examines the variation between samples' means (between groups and within groups). F value shows that there is a higher variation between the two samples (3.925). The response is significant if the value of (sig.) is below 0.05, which is 0.002). Then we will reject the null hypothesis of the ANOVA and accept the alternative hypothesis that there is a statistically significant difference between the two groups' means (the answer to the response is that the participants encountered difficulties in studying remotely). Figure 2 shows that the postgraduate students faced more difficulties in online studying with a rate of (3.925) compared to students at the diploma level (3.52).

Also, we compared the impact of gender on the result of the question "I encountered difficulties in distance studying". The results show that the highest percentage of the females who answered it, while the lowest percentage of the male category, where the standard significance value of the test appeared by (0.003) as shown in Table 4. Figure 3 shows the ANOVA result for the gender impact on the response to the question "I encountered difficulties in distance studying".

Table 3: ANOVA test result for academic level

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	22.761	5	4.552	3.925	0.002
Within Groups	286.496	247	1.160		
Total	309.257	252			

**Figure 2:** ANOVA result for the academic level impact on the question (I encountered difficulties in studying remotely)**Table 4:** ANOVA test result for the question (I encountered difficulties in studying remotely)

		Sum of Squares	Df	Mean Square	F	Sig.
I encountered difficulties in studying remotely:	Between Groups	10.948	1	10.948	9.211	.003
	Within Groups	298.309	251	1.188		
	Total	309.257	252			

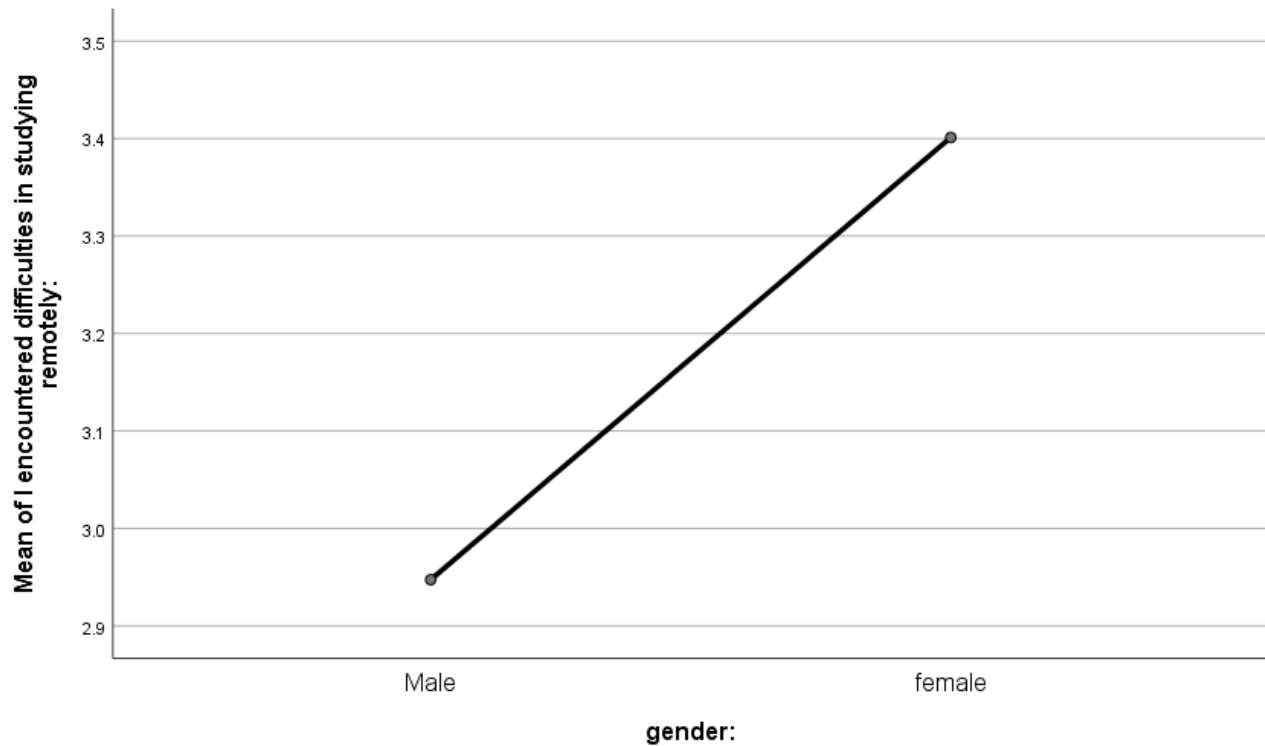


Figure 3: ANOVA test result for the question (I encountered difficulties in studying remotely)

A total of 252 participants answered the "(Isolate myself if you have been in close contact with someone with COVID-19)". There was a higher variation between the females and males in responding to this question, with a rate of (9.149). Table 5 presents significant responses of participants based on the value of Sig of 0.003), which means the participants were aware of the COVID 19 policies. Figure 4 shows the ANOVA test result for the question (Isolate myself if you have been in close contact with someone with COVID-19) based on the two classes (female, male). The highest number of participants were female, with a mean square of (14.184).

Table 5: ANOVA test result for the question (Isolate myself if you have been in close contact with someone with COVID-19)

		Sum of Squares	Df	Mean Square	F	Sig.
Isolate myself if you have been in close contact with someone with COVID-19.	Between Groups	14.184	1	14.184	9.149	.003
	Within Groups	389.144	251	1.550		
	Total	403.328	252			

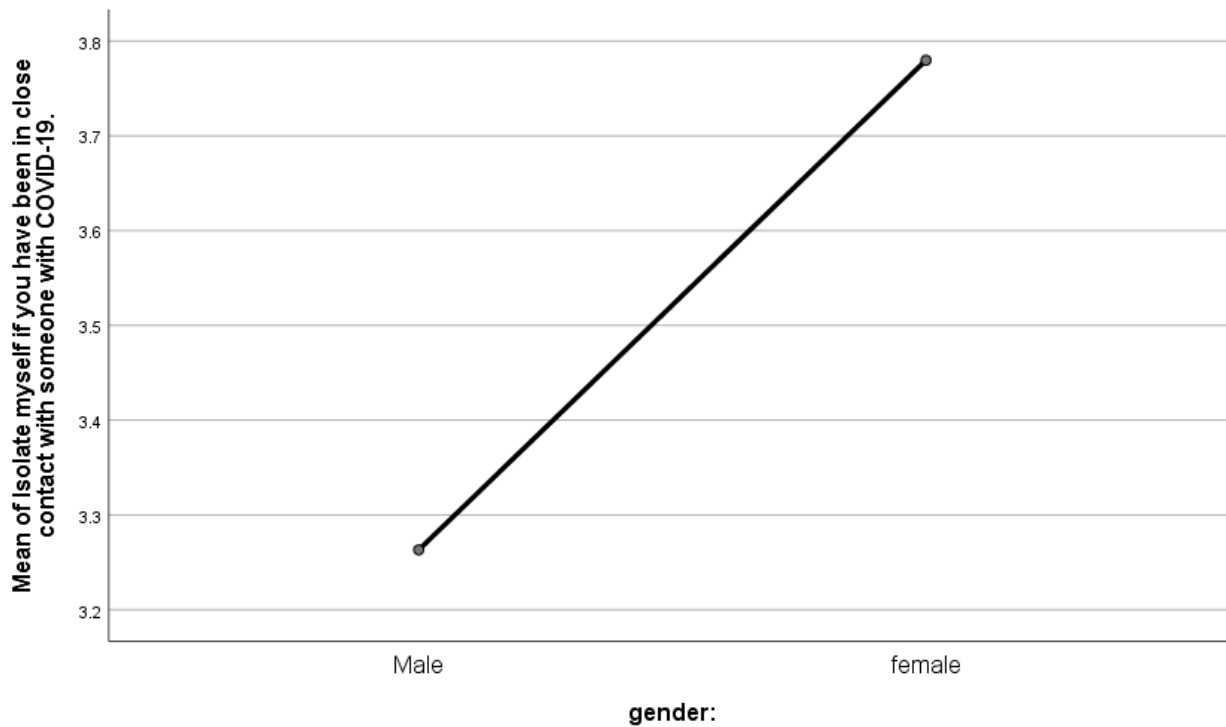


Figure 4: ANOVA test result for the question (Isolate myself if you have been in close contact with someone with COVID-19) based on gender (female, male).

A total of 252 participants answered the question "(The effects of COVID-19 reduced communication between relatives)". There was a small variation between groups in responding to this question, with a rate of 3.955. Table 6 shows significant responses of participants based on the value of Sig of 0.004), which means that the COVID-19 reduced communication between relatives during the COVID period. Figure 5 presents the ANOVA test result for the marital status. The highest number of participants were singles, with a mean square of 3.6, followed by married people.

Table 6: ANOVA test result for the question (The effects of Covid-19 reduced communication between relatives)

		Sum of Squares	Df	Mean Square	F	Sig.
The effects of Covid-19 reduced communication between relatives.	Between Groups	18.418	4	4.604	3.955	.004
	Within Groups	288.713	248	1.164		
	Total	307.130	252			

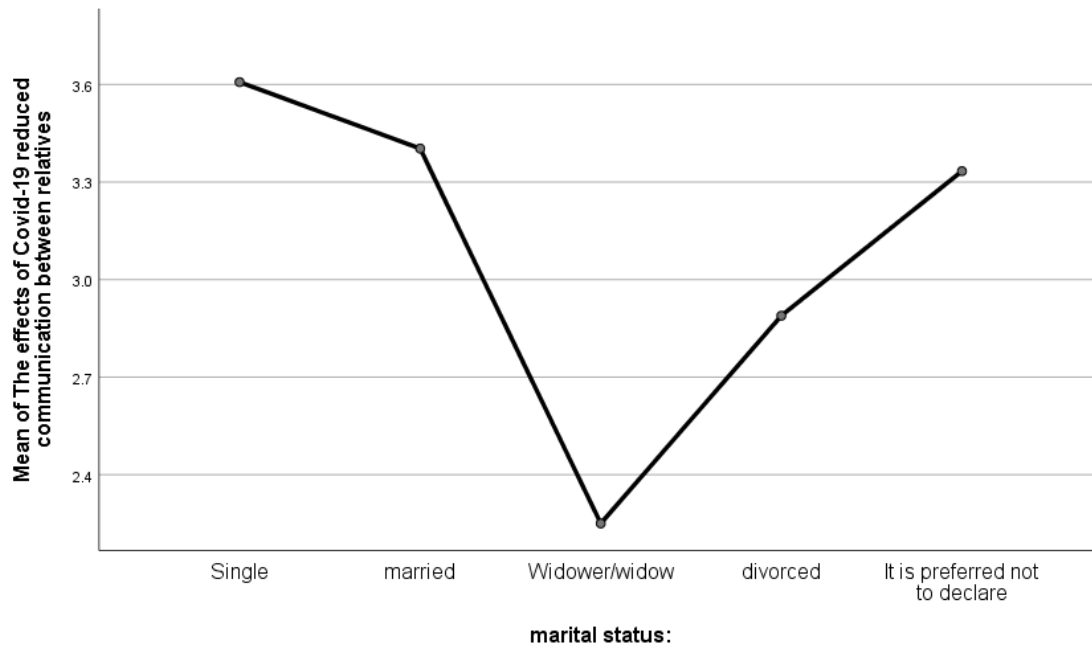


Figure 5: ANOVA test result for the question (The effects of Covid-19 reduced communication between relatives) based on marital status.

In a linear regression model, one or more independent variables (predictor/forecaster variables) will be described by a dependent variable (response variable) (Uraibi et al, 2009; Yousif et al, 2017; Yousif J., 2016; Yousif & Saini, 2020; Yousif & Saini, 2013). The linear regression model is used to determine the impact of (Age, gender, and academic level) on the results of the question “The impact of Covid-19 negatively on my study”. Table 7 presents the descriptive statistics data for the 254 participants. Table 8 shows the correlations statistics data that indicate the three variables (age, gender, and academic level) significantly impacting the results of the question “The impact of Covid-19 negatively on my study” based on the Sig. (1-tailed) test values < 0.05.

Table 7: descriptive statistics data

	Descriptive statistics data		N
	Mean	Std. Deviation	
The impact of Covid-19 negatively on my study.	3.27	1.103	254
Age:	2.64	.854	254
gender:	1.69	.462	254
Academic level:	4.02	1.348	254

Table 8: correlations statistics data

Correlations					
	The impact of Covid-19 negatively on my study.		Age:	gender:	Academic level:
Pearson Correlation	The impact of Covid-19 negatively on my study.	1.000	.040	.154	.181
	Age:	.040	1.000	.118	.231
	gender:	.154	.118	1.000	.300
	Academic level:	.181	.231	.300	1.000
Sig. (1-tailed)	The impact of Covid-19 negatively on my study.	.	.261	.007	.002
	Age:	.261	.	.031	.000
	gender:	.007	.031	.	.000
	Academic level:	.002	.000	.000	.
N	The impact of Covid-19 negatively on my study.	254	254	254	254
	Age:	254	254	254	254
	gender:	254	254	254	254
	Academic level:	254	254	254	254

The model summary shown in Table 9.

Table 9: the Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.209 ^a	.044	.032	1.085	.044	3.803	3	250	.011	1.848

a. Predictors: (Constant), Academic level:, Age:, gender:

b. Dependent Variable: The impact of Covid-19 negatively on my study.

5. Conclusion

The current study aims to test the impact of the Corona pandemic on the academic level of students and whether students prefer to study remotely or not. The study also discussed the impact of the pandemic on the amount of communication between students and their relatives. The questionnaire was published online and 254 people participated in it.

The results of the ANOVA test related to the academic level showed that there is a significant discrepancy between the two samples by 3.925. The (sig.) value was less than 0.05, which is 0.002, which confirms that there is a statistically

significant difference between the two groups and that postgraduate students faced more difficulties in studying online with an average of 3.925 compared to diploma level students (3.52). The results also showed that the highest percentage of females answered the question, while the lowest percentage of participation was from the male category, where the standard significance value of the test appeared to be by (0.003).

A total of 252 participants answered the question "Isolate myself if I have been in close contact with someone with COVID-19". There was a difference in the results between females and males in answering this question, with a percentage of (9.149). The study also proved that the participants were more aware of following the procedures in dealing with COVID (based on the Sig value of 0.003), and the largest number of female participants was with an average square (14,184).

A total of 252 participants answered the question "(Have the effects of COVID-19 reduced contact between relatives)?" There was little difference between groups in answering this question, with an average of 3.955. Based on a Sig value of 0.004), which means that COVID-19 has reduced contact between students and relatives during the COVID period. The largest number of participants was singles, with a mean square of 3.6, followed by married people.

The biggest challenge that we faced when completing the study was the small number of participants from different age and school groups. As well, the time specified for the completion of the study was short, which reduced the number of results we obtained. Among the future goals of the study is the application of linear and non-linear mathematical models to predict the results of the impact of COVID on students and their academic level.

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