

Quality of Life and Psychological Health during Covid-19 Pandemic among Medical Students of Suez Canal University

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Abstract

Background: University students are a particular social group with an active life. The pandemic emergency drastically changed their lives, considering university restrictions. The call to stay at home during the COVID-19 pandemic is one of the causes of social isolation, anxiety, stress, and depression. **Objective:** This study was conducted to assess the effect of the COVID-19 pandemic on the quality of life and psychological health of medical students at Suez Canal University, Egypt. **Material and Methods:** A descriptive cross-sectional study, including 305 medical students, was conducted using multistage sampling. Data was collected using the adapted version of the WHOQOL-BREF scale and the shorter version of the Depression Anxiety Stress Scale (DASS-21). **Results:** Among 305 medical students who were enrolled in the study, (64.6%) were females, single (85.2%), with good to excellent general health status (36.4% - 35.4%). Regarding the WHOQOL-BREF scale, it was found that only the environmental dimension of QoL had a higher mean with mean \pm SD (14.85 \pm 3.10). The percentage of participants rated abnormal regarding depression, anxiety, and stress (26.2%, 29.2%, 8.2%) respectively. **Conclusion:** The study highlights that the COVID-19 pandemic had little effect on medical students' quality of life and psychological health.

Keywords: anxiety, covid-19, depression, health, social

Background

The burden of COVID-19 in terms of the number of confirmed cases and deaths differs between countries. Globally, as of Jan 17, 2023, there have been 662,735,182 confirmed cases of COVID-19, including 6,706,305 deaths.⁽¹⁾ The total number of deaths in Egypt was 12,738 by April 2020, as reported by WHO.⁽²⁾

Quality of Life (QoL) is a multidimensional discipline that involves five categories: physical well-being, material well-being, social well-being, emotional well-being, development, and

activity.⁽³⁾ QoL assessment helps us identify the range of problems that can influence people's everyday lives.⁽⁴⁾

During pandemics, the population's psychological responses to infection play an essential role in spreading and containing the disease.⁽⁵⁾ The pandemics are associated with many psychosocial stressors, including health threats to oneself and loved ones, Separation from family and friends, shortages of food and medicine, and significant changes in daily routine.⁽⁶⁾

A recent study from Morocco in 2021 declared that the COVID-19 pandemic

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negatively affected health-related quality of life.⁽⁷⁾ Implementing preventive measures such as social distancing and online learning affects people's daily life activities and certainly influences individuals' quality of life (QOL) badly.⁽⁸⁾

Many researchers studied the adverse psychological effects of quarantine, and the term "corona phobia" was introduced to describe stress and anxiety among general populations.⁽⁹⁾

Medical student anxiety has increased after the onset of the COVID-19 epidemic. A survey of 741 medical students across the USA evaluated students' anxiety with a 7-point Likert scale. There was a statistically significant increase in self-reported emotional exhaustion and burnout from before the pandemic and since the pandemic started ($p < 0.001$).⁽¹⁰⁾

Not only has COVID-19 impacted day-to-day learning in both the academic and clinical settings for medical students, but it has also had a significant impact on the specialties they are considering going into, as well as their confidence in themselves as future physicians.

A survey of 337 allopathic medical students found that 20.2% of respondents thought the pandemic would affect their choice of specialty, with the most common

reason being the inability to explore specialties they were interested in ($p < 0.0001$).⁽¹¹⁾

Family physicians are in the best position to study the effect of COVID-19 on QoL and psychological health, as they are the first gate of contact for medical students with the health care system. Moreover, medical students are one of the critical and vulnerable population segments that will affect general health in the future, and they are most exposed to many stressors that can affect their QoL and psychological health as they work in a clinical field. Therefore, this study assessed QoL and psychological health during the COVID-19 pandemic among Suez Canal University medical students.

Methods

Research design: An observational cross-sectional study was conducted to assess the effect of the COVID-19 pandemic on quality of life and psychological health among medical students of Suez Canal University, Egypt.

Study setting: Recruitment took place at the Faculty of Medicine, Suez Canal University, in the Ismailia Governorate. Ismailia Governorate is one of the Canal Zone governorates of Egypt. It is located on the eastern border of Egypt, 5066 Km², in the middle of the Suez Canal.



Study time: The study was conducted from February 2021 to December 2022.

Study population: The study was conducted on 305 medical students who fulfilled the inclusion criteria.

Inclusion criteria and exclusion criteria: Our sample included both genders of medical students who accepted to participate in the study. Exclusion criteria included medical students diagnosed with any psychological conditions.

Sampling

Sample size: The researcher used two different proportions as a reference to calculate and get a higher sample size.

- P1= The proportion of pharmacy students in the United Arab Emirates who perceived an impaired quality of life during the COVID-19 pandemic was 7.4%.⁽¹²⁾
- P2= the proportion of the general population of Saudi Arabia with the perception of psychological distress during COVID-19 was 23.6%.⁽¹³⁾

So, the sample size was selected based on the outcome measure with the higher proportion (psychological distress during COVID-19): 277 participants. By adding the 10% dropout, the sample size was extended to 305 subjects.

Sample technique: Participants in this research were recruited using a multistage sampling technique.

In the first step, a proportional stratified sampling technique was used to obtain a sample size representing the whole population. There were 1919 medical students during the 2021–2022 academic year. Among them were 517 students in the first year, 529 students in the second year, 371 students in the third year, 213 students in the fourth year, 125 students in the fifth year, and 164 students in the sixth year. To ensure that each academic year was represented equally, 16% of the participants were selected from each year (82 students from the first year, 84 students from the second year, 59 students from the third year, 34 students from the fourth year, 20 students from the fifth year and 26 students from sixth year) respectively.

In the second step, the participants in each academic year were selected by systematic sampling technique with a fixed interval calculated according to this equation: $K = N/n$. where k was the interval, N was the population size, and n was the sample size. So, according to this equation, every ^{sixth} student was selected from the list for each academic year.

Study tools & questionnaires:

Data was collected using a self-administered semi-structured questionnaire through direct interviews. It consists of 3 parts:

Part 1: Data regarding the students' socio-demographic and health status characteristics using the El-Gilani Socio-economic Status Questionnaire.⁽¹⁴⁾

Part 2: Twelve items from the WHOQOL-BREF scale were adopted to assess the effects of COVID-19 on QoL during the lockdown^(15,16,17). The adapted version of the WHOQOL-BREF scale consisted of 12 items, with five-point ratings on each item from 1 to 5; therefore, the lowest possible score was 12, and the highest possible score was 60 for the total scale.

Part 3: The shorter version of the Depression Anxiety Stress Scales (DASS-21) was used to assess the effects of COVID-19 on psychological health during the period of lockdown.⁽¹⁸⁾ Each subscale included seven items rated on a 4-point Likert scale ranging from 0 (did not apply to me) to 3 (applied to me very much) that assessed the levels of depression, anxiety, and stress.

The cutoff scores for depression were 0–9 for normal, 10–13 for mild, 14–20 for moderate, 21–27 for severe, and 28–42 for extremely severe levels. For anxiety, the

scores ranged from 0–7 for normal, 8–9 for mild, 10–14 for moderate, 15–19 for severe, and 20–42 for extremely severe levels. For stress, the scores ranged from 0–14 for normal, 15–18 for mild, 19–25 for moderate, 26–33 for severe, and 34–42 for extremely severe levels.

A pilot study was conducted on 12 medical students who were excluded from the study to assess the understandability, clarity, acceptability, and meaning of the questionnaire items.

Outcome variables

- Quality of life of those students during the COVID-19 pandemic.
- Psychological health of students as a consequence of COVID-19.

Data management:

Data was analyzed using the Statistical Package for Social Sciences (SPSS) version 25. Descriptive characteristics were outlined as means, standard deviations (SD) or median, and interquartile range (IQR) for continuous variables according to the sample distribution tested using the Shapiro-Wilk test, and the categorical variables were outlined as frequency and percentages. Mann-Whitney test was used to compare the two groups for not normally distributed quantitative variables. Logistic regression was conducted to detect the most

independent factors affecting psychological health. Results were considered statistically significant at a p-value of less than or equal to 0.05.

Ethical consideration:

All procedures performed in the study were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments. Administrative permissions were obtained from the dean of the faculty of medicine, who informed us of the aim of the study. The confidentiality of data was assured. Ethical approval for the study was obtained from the Ethics Committee (code 4867#) on 14/3/2022.

Results

Table 1 demonstrates descriptive statistics of the main study variables regarding socio-demographic characteristics; our study included 305 adult students distributed over six academic years; the majority of them were females (64.6%), single (85.2%), have middle socio-economic status (59%), lives in urban areas (74.4%), with good to very good general health status (36.4% - 35.4%), have no chronic diseases (92.5%). Moreover, regarding the WHOQOL-BREF scale, the environmental dimension of QoL had a higher mean with a

mean of \pm SD (14.85 \pm 3.10), while stress had a higher mean with a mean of \pm SD (6.79 \pm 4.67) regarding the depression anxiety stress scale.

Table 2 shows that the participants rated abnormal regarding depression, anxiety, and stress were (26.2%, 29.2%, 8.2%) respectively.

Table 3 shows no significant association between quality of life and different characteristics of participants ($p > .005$) except for socio-economic status, as students with middle or high Socio-economic status have higher QOL scores than those with low or very low socio-economic status. On the other hand, there was a significant association between Depression Anxiety Stress Scales (DASS-21) and different characteristics of participants as it was observed that higher DASS-21 score was recorded in participants who were in the last three grades, were females, lived in urban, had chronic, mental or psychological diseases.

Table 4 shows a significant correlation between the Spiritual dimension of QoL and Depression Anxiety Stress scores.

Table 5 shows the results of hierarchical multiple linear regression conducted to investigate the factors associated with psychological health during the lockdown

period. The analysis was initially adjusted for grade, gender, residence, general health status, mental diseases, and psychological diseases (model 1).

In model 2, variables such as the environmental dimension of QOL, the social dimension of QOL, the spiritual dimension of QOL, and WHOQOL-BREF were added. Both model 1 and model were significant (r-square= 0.169, $p < 0.001$), (r-square= 0.213, $p < 0.001$) respectively.

Discussion

The present study was designed to assess the effect of the COVID-19 pandemic on the quality of life and psychological health of medical students at Suez Canal University, Egypt.

In the recent research, participants assessed the influence of the COVID-19 pandemic on their quality of life, ranging from poor to abysmal (29.6%). They also evaluated the pandemic's effects on their relationships with friends and family, with 30.2% indicating little impact and 37.7% reporting no significant effect. Additionally, participants rated the pandemic's impact on their spiritual connections, and the comfort faith provides during difficult times, with 24.6% experiencing little effect and 11.2% reporting no effect. These results align with the Italian study, which was conducted by

Epifanio *et al.* in 2021 among 2251 Italian adults; it showed poorer QoL during the Covid-19 pandemic.⁽¹⁹⁾

In this study, regarding the WHOQOL-BREF scale, it was found that the environmental dimension of QoL had a higher mean \pm SD (14.85 ± 3.10). These findings disagreed with the findings of the study that was conducted in Brazil by Filipe *et al.* among 210 medical students through a web-based survey between February and March 2021; he reported that the psychological domain was the most affected, showing lower scores during COVID-19 second wave, this can be explained by the difference in the socio-demographic characteristics of the Egyptian and the Brazilian students and the difference in the burden of the disease and time at which data were collected as the data of the current study was collected late in 2022 and the data of the other research was collected early in 2021.⁽²⁰⁾

In the current study regarding psychological health, it was observed that the participants rated abnormal regarding depression, anxiety, and stress (26.2%, 29.2%, 8.2%), respectively.

Among the current study attendants, it was observed that there was a significant association between Depression Anxiety Stress Scales (DASS-21) and different



characteristics of participants as it was observed that higher DASS-21 score was recorded in participants who were in the last three grades, being females, live in urban and had chronic diseases.

These results were consistent with the results of a Moroccan study in 2021, which was conducted by Essangri *et al.*, among 549 medical students; the study found that Females were more likely to report severe symptoms of anxiety ($P = 0.042$), depression ($P < 0.001$), insomnia ($P = 0.007$), and distress ($P = 0.007$).⁽²¹⁾

Moreover, our results agreed with an online Egyptian survey among Egyptian university students during the first week of May 2020 in El-Mansoura city using a short version of the Depression Anxiety Stress Scale-21 (DASS-21) and socio-demographic data. Overall, 70.5, 53.6, and 47.8% of Egyptian students had depression, anxiety, and stress, respectively, and being a female and having a preexisting chronic disease increases the risk of depression, anxiety, and stress among Egyptian students.⁽²²⁾

The current study demonstrated that there was a significant negative correlation between the Spiritual dimension of QoL and Depression Anxiety Stress scores. Our finding comes in line with the findings of Fahad D *et al.*, who reported that participants

who had experienced anxiety, depression, and stress were at an increased risk of having lower QoL scores.⁽²³⁾

Moreover, our observations were somewhat consistent with a previous study from KSA in 2020, conducted by Lee *et al.*, who found that higher distress levels were expected among people who rated their health as poor.⁽²⁴⁾

In the present study, hierarchical multiple linear regression was conducted to investigate the factors associated with psychological health during the lockdown period. It showed that gender, residence (model 1), and spiritual dimension of QOL (model 2) significantly affected psychological health.

This result was consistent with the finding of Rahman *et al.*, who conducted a cross-sectional study across 17 countries from 2020 to Jan-2021; he declared that being female, perceived distress due to change of employment status, comorbidity with chronic health conditions were associated with higher levels of psychological distress and fear among covid-19 pandemic.⁽²⁵⁾

Conclusion:

The study highlights that the COVID-19 pandemic had little effect on medical students' quality of life and psychological

health. To complete and confirm our findings, more large-scale cohort studies should be performed on medical students.

Declarations

Competing interests: The authors declare that they have no conflict of interest.

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Informed Consent: Informed consent was obtained from all participants included in the study.

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Table 1. Characteristics of the study sample (n = 305).

Variables	Number (305)
Grade, n (%)	
1st year	82 (26.9%)
2nd year	84 (27.5%)
3rd year	59 (19.3%)
4th year	34 (11.1%)
5th year	20 (6.6%)
6th year	26 (8.5%)
Gender, n (%)	
Male	108 (35.4%)
Female	198 (64.6%)
Social status, n (%)	
Single	255 (83.6%)
Married	45 (17.8%)
Divorced/Widow	5 (1.6%)
Socio-economic status (SES), n (%)	
Very Low	4 (1.3%)
Low	47 (15.4%)
Middle	180 (59.0%)
High	74 (24.3%)
Residence, n (%)	
Urban	227 (74.4%)
Rural	78 (25.6%)
Special habits, n (%)	
Coffee or tea	163 (53.4%)
Smoking	7 (2.3%)
Others	18 (5.9%)
None	117 (38.4%)
General health status, n (%)	
Excellent	58 (19.0%)
Very good	108 (35.4%)
Good	111 (36.4%)
Fair	25 (8.2%)
Poor	3 (1.0%)
Chronic diseases	
Yes	23(7.5%)
No	282(92.5%)
Variables	Mean ± SD
WHOQOL-BREF scale, Means ±SD	36.93±5.97
▪ Environmental dimension of QoL	14.85±3.10
▪ Social Relations dimension of QoL	9.33±2.12
▪ Religious/Spiritual dimension of QoL	6.7±1.61
Depression Anxiety Stress Scales (DASS-21), Means ±SD	18.26±13.25
▪ Depression	6.18±4.78
▪ Anxiety	5.28±4.86
▪ Stress	6.79±4.67

Table 2. The effects of COVID-19 on psychological health during the period of lockdown (n = 305).

Variables	Number (305)	Frequency (%)
Depression		
▪ Normal	225	73.8
▪ Mild	53	17.4
▪ Moderate	25	8.2
▪ Severe	2	0.7
▪ Extremely severe	0	0.0
Anxiety		
▪ Normal	216	70.8
▪ Mild	23	7.5
▪ Moderate	57	18.7
▪ Severe	9	3.0
▪ Extremely severe	0	0.0
Stress		
▪ Normal	280	91.8
▪ Mild	23	7.5
▪ Moderate	2	0.7
▪ Severe	0	0.0
▪ Extremely severe	0	0.0



Table 3. Association between different characteristics of participants and both quality of life and Depression Anxiety Stress Scales (DASS-21)

Variables	Quality of Life domains				Depression Anxiety Stress Scales (DASS-21)			
	The environmental dimension of QoL Median [IQR]	The social dimension of QoL Median [IQR]	The spiritual dimension of QoL Median [IQR]	WHOQOL-BREF total score Median [IQR]	Depression Median [IQR]	Anxiety Median [IQR]	Stress Median [IQR]	DASS-21 Median [IQR]
Grade								
▪ 1st three years	15[12-17]	9[8-11]	7[6-8]	36[33-41]	5[2-9]	4[1-8.5]	7[3-10]	17[6-25]
▪ Last 3years	15[14-17]	9[8-11]	6[6-8]	36[34-40]	7[3-10]	6[2-10]	7[4-10.8]	21[10-31.5]
U	8412.5	8816.5	8181.0	8893.5	8069.0	7573.5	7963.5	7797.0
P	0.382	0.783	0.215	0.875	0.167	0.034*	0.124	0.037*
Gender								
▪ Male	15[12-17]	9[8-11]	7[6-8]	36[32-41]	4[0.25-7.15]	2[0-7]	5[1-9]	12[3.25-21]
▪ Female	15[13-17]	9[8-11]	7[6-8]	37[34-41]	7[3-10]	6[2-10]	7[4-10.5]	19[11.5-29.5]
U	10571.5	9482.5	10596.0	10121.50	8488.5	7679.5	8181.5	7880.0
P	0.927	0.112	0.953	0.48	0.003*	<0.001*	<0.001*	<0.001
SES								
▪ Very Low/Low	15[12-17]	9[7-10]	6[6-8]	36[32-40]	6[3-8]	5[1-9]	7[4-10]	19[8-28]
▪ Middle /High	15[13-17]	9[8-11]	7[6-8]	37[34-41]	6[2-9]	4[1-9]	7[3-10]	17[7-27]
U	6435.0	5420.0	5922.0	5804.0	6359.5	6094.0	6359.5	6310.0
P	0.941	0.062	0.322	0.240	0.837	0.502	0.837	0.771
Social status								
▪ Un Married	15[13-17]	9[8-11]	7[6-8]	36[33-40]	6[2-9]	4[1-9]	7[3-10]	17[7-27.8]
▪ Married	16[13.5-18]	10[8.5-12]	7[6-8]	38[34-42]	7[3-10]	5[2-8]	7[4.5-10]	19[10-27.5]
U	4741.5	4785.0	5025.0	4859.5	5103.0	5563.5	5525.5	5342.0
P	0.04*	0.048*	0.121	0.069	0.169	0.597	0.55	0.351
Residence								
▪ Urban	15[13-17]	9[8-10.3]	7[6-8]	36[33-41]	7[3-11]	6.5[1-11]	7[4-10]	21[9.8-32]
▪ Rural	15[12-17]	9[8-11]	7[6-8]	37[34-41]	6[2-9]	4[1-8]	7[2-10]	17[6-25]
U	8585.0	8388.0	8619.0	8339.0	7582.5	7289.0	7942.5	7444.5
P	0.687	0.483	0.721	0.443	0.05*	0.019*	0.173	0.035*
Special habits								
▪ yes	15[11-17]	9[8-11]	7[6-8]	36[33.3-41]	6[3-9]	5[1-9]	7[4-10]	18.5[9-28]
▪ None	15[10.8-17]	9[8-11]	7[6-8]	36[33-41]	5[2-9.5]	4[1-9]	6[2-10]	16[6-26]
U	9967.0	10874.0	10958.0	10656.5	10378.5	10422.0	9815.0	10171.5
P	0.165	0.866	0.956	0.647	0.405	0.438	0.112	0.269
General health status								
▪ Excellent /Very good/Good	15[13-17]	9[8-11]	7[6-8]	36[33.5-41]	6[2-9]	4[1-9]	7[3-10]	17[7-25.5]
▪ Fair/ Poor	15[11-18.7]	9[7-10]	6.5[6-8]	35[30.3-40]	9[4.3-11.8]	7[2-11]	7[4-9]	21.5[15-33.3]
U	3755.0	3067.0	3710.5	3250.5	2931.0	3289.0	3116.5	3067.0
P	0.780	0.064	0.699	0.157	0.032*	0.182	0.085	0.07
Chronic diseases								
▪ Yes	16[14-19]	9[9-11]	7[6-8]	38[36-41]	7[4-13]	5[3-11]	9[6-14]	21[13-38]
▪ No	15[13-17]	9[8-11]	7[6-8]	36[33-41]	6[2-9]	4[1-9]	7[3-10]	17[7-27]
U	2506.0	2951.5	2981.0	2791.0	2499.5	2501.5	2279.5	2387.0
P	0.067	0.467	0.509	0.265	0.033*	0.066	0.017*	0.035*

Abbreviations: IQR, interquartile range, QoL Quality of life.

U: Mann–Whitney U test, SES: Socioeconomic status

*P: Statistically significant at $p \leq 0.05$ 

Table 4. Correlation between Quality of Life (WHOQOL-BREF) and Depression Anxiety Stress Scales (DASS-21).

Variables	DASS-21	Depression	Anxiety	Stress
WHOQOL-BREF				
r	0.023	0.031	-0.036	0.080
p	0.684	0.582	0.520	0.159
The environmental dimension of QoL				
r	0.105	-	-	-
p	0.066			
Social dimension of QoL				
r	0.058	-	-	-
p	0.31			
Spiritual dimension of QoL				
r	-0.143	-	-	-
p	0.012*			

P values are based on Spearman's correlation test as appropriate. Statistical significance at $P < .05$
 r: correlation coefficient

Table 5. Hierarchical linear regression of psychological health during the period of lockdown (n = 305).

Variable	Model 1			Model 2		
	B (SE)	OR (95% CI)	P	B (SE)	OR (95% CI)	P
Grade	2.8(1.6)	0.1(-0.37- 5.9)	0.08	2.04(1.6)	0.07(-1.0- 5.14)	0.19
Gender	4.8(1.4)	0.17(1.8- 7.7)	0.001*	4.8(1.4)	0.17(1.9- 7.7)	0.001*
Residence	-4.4(1.6)	-0.1(-7.6- -1.2)	0.007*	-4.4(1.5)	-0.14(-7.5- -1.3)	0.005*
General health status	1.1(2.5)	0.03(-3.8- 6.1)	0.649	1.9(2.4)	0.04(-2.9- 6.79)	0.44
The environmental dimension of QoL				0.4(0.2)	0.09(-0.1-0.82)	0.124
The social dimension of QoL				0.5(0.42)	0.09(-0.26-1.4)	0.181
The spiritual dimension of QoL				-1.85(0.4)	-0.2(-2.8--0.89)	<0.001*
WHOQOL-BREF				0.04(0.11)	0.01(-0.18- 0.27)	0.72

Abbreviations: B, Beta; SE, Standard Error; OR, Odds Ratio; CI, Confidence Interval. WHOQOL-BREF

Dependent Variable: Depression Anxiety Stress Scales (DASS-21)

Model 1: [r-square= 0.169; Model ANOVA: $F= 10.11$; $p<0.001$]

Model 2: [r-square= 0.213; Model ANOVA: $F= 8.86$; $p<0.001$]

المخلص العربي

جودة الحياة اثناء جائحة كوفيد-١٩ بين طلاب الطب بجامعة قناة السويس

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الخلفية: تلعب الاستجابات النفسية للسكان اثناء الاوبئة دورا هاما في انتشار الوباء او احتوائه وهذا يؤثر بشكل مباشر على جودة حياة السكان مما تؤدي الى خطر الإصابة بالاكنتاب وقد تؤثر بالسلب على جوده الحياة. اهداف الدراسة تحسين جودة الحياة بين طلاب كلية الطب جامعة قناة السويس اثناء جائحة كوفيد-١٩. طرق الدراسة: تم اعداد دراسة وصفية مقطعية تضمنت ٣٠٥ طالب من كلية الطب البشرى بجامعة قناة السويس وقد قام المشاركون بمليء استبيان منظمة الصحة العالمية الخاص بجودة الحياة (WHOQOL-BREF) بالإضافة الى استبيان مقياس الاكنتاب والقلق والضغوط (DASS-21). النتائج: صنف المشاركون تأثير جائحة كوفيد-١٩ على نوعية حياتهم بأنها سيئة الى سيئة جدا بنسبة (٢٩,٦%) وكذلك صنف ٢٥,٦% من العينة المدروسة تأثير الجائحة على صحتهم العامة بنفس النتيجة. الخلاصة: وفقاً للدراسة الحالية لقد تكيف طلاب كلية الطب مع التغييرات التي حدثت اثناء الوباء لدرجة لا تؤثر على جودة حياتهم وبيئتهم الصحية بشكل ملحوظ.