

## Original Research

# Psychological impact of COVID-19 pandemic on medical students: an online cross-sectional study

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### Abstract

COVID-19 pandemic has spread all over the world and has caused psychological impacts. Medical students are known to be vulnerable population, experiencing higher levels of anxiety, depression and other psychological disorders compared to non-medical students. The nature of life changes like what happened and still happening during the pandemic have its impact on mental health of the students. The aim of this study was to identify the psychological impacts of COVID-19 on medical students among different universities to develop profiles to characterize students' anticipated levels of psychological impacts during the pandemic. Also, to search for potential risk factors that could make students more likely to experience these impacts. An online survey was filled by medical students (n = 100) at faculties of medicine, dentistry, pharmacy and medical sciences of different universities: University of Benghazi, Libyan International Medical University, Omar Almokhtar University, Cairo University and Alexandria University. The students were taken to the further analysis. Thus, 55% of the participants had psychological impacts due to the pandemic and 17% had severe effect. Some of these impacts were actually positive as a large number (58%) of the participants felt relaxed during the pandemic. Multiple stressors were identified that contributed to the increased levels of stress, anxiety and depression. These included concern about academic performance (80%), concern about self/dear-one's health (90%), difficulty with concentration (46%), disruption to sleeping patterns (78%), increased social isolation (26%), disruption to eating patterns (48%), changing in the living environment (26%), financial difficulties (34%) increased class workload (20%) depressive thoughts (37%) and suicidal thoughts (07%). In conclusion, the study indicates that COVID-19 pandemic have positive and negative impacts on medical students. Thus, it is suggested that measures need to alleviate students' stress, which might have harmful effects in different aspects.

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**Keywords:** Anxiety, COVID-19, depression, medical students, psychological impact

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### Introduction

Psychological health problems are one of the highest subjects to investigation for these days. These problems can affect students' motivation, concentration and social interactions and the way they live their life [1]. The 2019

Annual Report of the Center for Collegiate Mental Health stated that anxiety is still the most common problem (62.7% of 82,685 respondents) among students who were subjected to Counseling Center Assessment of Psychological Symptoms [2]. Investigators also reported

that anxiety continues to be the most common problem of the students that seek services at university counseling centers. Despite the need for mental health care services at post-secondary institutions, surprisingly, a small number of students committing suicide contact these services [3]. Such negative ideas about mental health diagnosis and care have been found to be associated with decreasing the desire to be treated [4].

COVID-19 outbreak is posing a severe public health threat worldwide. The COVID-19 pandemic has increased the focus on the psychological health of many affected populations. The new changes can create new stressors including fear and worry for one-self or dear people or even about the lifestyle that will be changed. A recent study of coronavirus disease outbreaks and pandemics said stressors such as infection fears, frustration, boredom, inadequate supplies, inadequate information, financial loss and stigma are the reason for the psychological problems [5]. Although studies have assessed mental health issues during epidemics, most have focused on health workers, patients, children and the general population [6, 7]. For example, a recent poll by The Kaiser Family Foundation showed that 47% of those sheltering in place reported negative mental health effects resulting from worry or stress related to COVID-19 [8], also from China [9 - 11] and USA [12]. There is an evidence of the psychological effects of the current pandemic on college students who are known to be a vulnerable population [13]. In a current systematic review and meta-analysis, it is observed an overall high psychological impact of COVID-19 pandemic among healthcare workers, the general public, and patients with pre-existing conditions or COVID-19 [14]. However, to the best of our knowledge, there is no published data yet about the psychological impacts of the COVID19 among medical students. Hence, this study aimed to identify major stressors associated with the COVID-19 pandemic and to understand their effects on mental health status among medical students in different universities.

## Materials and methods

**Study design:** An online survey was made with the purpose of knowing the main psychological effects of COVID-19 on a selective sample of medical students at different universities. The survey aimed to search for the ways that students have been dealing with the pandemic and the lockdown. First, it was listed most of the psychological impacts that can happen due to COVID-19 and the students were asked if as an example (stress) increased, decreased or remained the same because of the

COVID-19 pandemic. For those who indicated increased stress during the pandemic, we questioned if it was mild, moderate or severe, after that it was listed the highest to the lowest changes that happened to the students. Second, it was asked about some changes in the lifestyle of the students during the lockdown and some personal data if they or their loved ones experienced the virus. Then, it was elicited pandemic-highest stressors and their manifestations across some academic-, health- and lifestyle-related categories as concern of academic performance, eating pattern, sleeping pattern, financial difficulties, changes to their living environment, academic workload, social isolation, concern about own/dear people health, difficulty in concentration, depressive and suicidal thoughts. These constructs were derived from existing literature identifying prominent factors affecting college students' mental health [15, 16]. Feedback on the severity of COVID-19's impact on these aspects were elicited using a 5-point scale: 1 = none, 2 = minimal or as before the virus, 3 = mild, 4 = moderate and 5 = severe.

**Participants:** A total of hundred students were involved in this online survey from various faculties: the faculties of medicine, dentistry, pharmacy and medical sciences from different universities: university of Benghazi, Libyan international medical university, Omar-Almokhtar university, Cairo university and Alexandria university. All the universities held-their classes in March, 2020 and as for Libyan universities, they stopped all the classes and did not even continue online. Benghazi and other cities ordered stay-at-home order on March and April, 2020, however, Libya in general had a loose lockdown. This survey was conducted during April 2021, but all the questions were asked about the time of the lockdown. Participants were recruited by medical student researchers through email, text messaging and social media.

**Procedure:** The survey was distributed via google forms and subsequently the data were transferred into excel and word documents. Prior to filling the forms, participants were messaged all the information required about the study and informed about the use of data for research studies as ethical considerations. All the students had agreed to participate in the study.

**Data analysis:** Descriptive statistics by SPSS package version 22 were used and compiled to describe participants' demographics (age, gender and academic year). Then, a degree of the different impacts and differentiated how they affected the participants from 0 to 5 according to the severity, then, percentage was made.

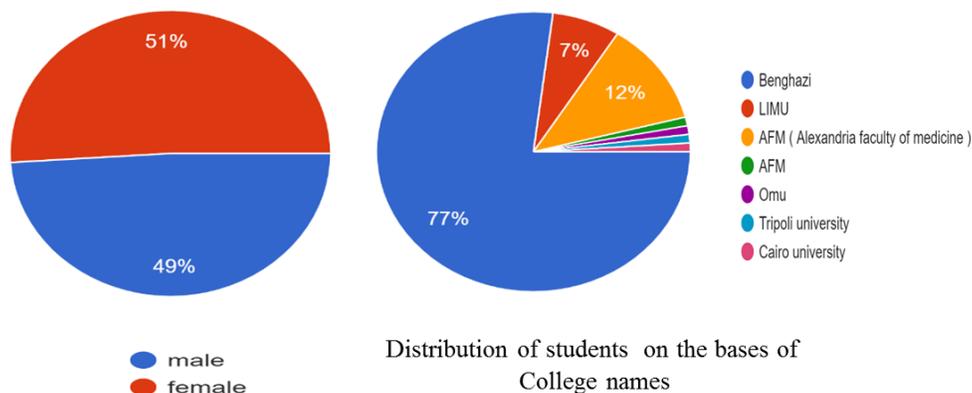
Participants answered 11 academics, health and lifestyle-related questions were analyzed to understand relative impacts of the pandemic on various aspects of medical students' mental health.

## Results

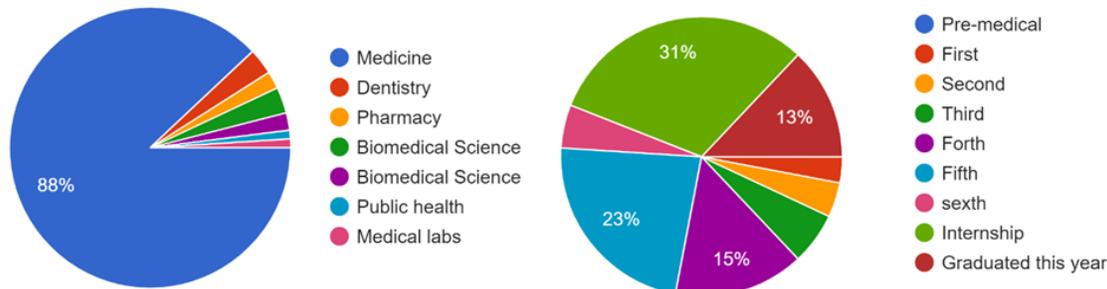
**Figure 1** shows the total of hundred participants that had fulfilled all the criteria. Thus, 49% of the participants were males and 51% were females. The mean age of the students was 25 years, 77% of the whole participants were

from university of Benghazi and the rest were from other universities. 88% of the total numbers were medical students (**Figure 2**). 31% of the students were interns and the others were from 5<sup>th</sup>, 4<sup>th</sup>, 3<sup>rd</sup>, 6<sup>th</sup>, 2<sup>nd</sup> and 1<sup>st</sup> year medicine and premedical (23%, 15%, 06%, 05%, 04%, 02% and 01%, respectively).

In addition to 13% of the participants were freshly graduate which means that they were interns during 2020 (**Figure 2**).



**Figure 1:** Percentage of male and female students (left) and distribution of the participants among various universities (right)



**Figure 2:** Percentage of the students in different faculties (left) and percentage of educational years of the participants (right)

With regard to the questions: Did you get COVID-19? If yes were you asymptomatic? Did you have mild, moderate infection or were you admitted to the hospital? Thus, 70% of the participants did not get COVID-19 virus or at least they were asymptomatic and did not know, 01% had it but was asymptomatic, 21% had mild symptoms, 07% had moderate symptoms and 01% was admitted to the hospital.

How do you feel about the pandemic in general? The collected data of some general information about how they felt or still feel about the pandemic in general revealed that 36% thought it is scary, 33% thought it is sad, 16% thought it is dramatic, 14% thought it did not deserve all the hype it got at first and only 01% thought it

would have been better if we dealt with it from the start more smartly. How do/did you feel about the lockdown? They also expressed their feeling about the lockdown we had during the first months of COVID-19. Thus, 30% thought it was a chance to study, learn a new skill or at least do some home activities like watching movies, 29% thought it was a chance to relax, 24% thought it was useless, 15% thought it was boring, 01% thought it was anxious and only 01% said it was not a real lockdown because nobody cared to stay home so he cannot really answer. The impact: out of the 100 students, 37% said they experienced a moderate to severe psychological problems by 48% (**Table 1**). The students said one of their families experienced COVID-19 virus and 34% from

them had someone dear died because of it. Stress and being bored from mild to severe were the main impact on the students with 72% of the participants, empathy towards others was the third with 68%, sadness was the fourth with 65%, fatigue was the fifth with 62%, relaxation was the sixth with 58%, feeling unsafe was the seventh with 57% and anxiety were 56%. The last of the highest tenth were the feeling of losing their freedom and losing motivation with both 55% of the participants. In addition to these impacts, there are ten more which are shown in **Table 2**.

**Table 1:** The COVID-19 knowledge and impact upon students

Q.N	Survey questions	Answers	
		Yes	No
1	Did you have any previous knowledge about Corona virus?	46%	54%
2	Do/Did you experience any psychological problem?	63%	37%
3	Did any of your family members get COVID-19 virus infection?	52%	48%
4	Did you lose someone dear due to COVID-19 virus infection?	66%	34%

**Table 2:** Percentage of students with psychological conditions

Effects	Students who experienced it	Students with severe effect
Stress	72%	29%
Being bored	72%	29%
Empathy toward others	68%	27%
Sadness	65%	17%
Fatigue	62%	25%
Relaxation	58%	16%
Unsafe	57%	11%
Anxiety	56%	18%
Loss of motivation	55%	21%
Loss of freedom	55%	19%
Disappointment	54%	14%
Anger	53%	20%
Depression	53%	13%
Loss of trust	53%	09%
Hopeless/Helpless	52%	20%
Happiness	51%	14%
Active	51%	08%
Optimism	40%	12%
Loneliness	36%	14%
Guilt	24%	08%
<b>Mean</b>	<b>54.35%</b>	<b>17.2%</b>

**Challenges to medical students' mental health during COVID-19:** Some constructs were derived from an existing literature identifying prominent factors affecting college students' mental health [20, 21] which are given in **Figure 3**. Concerns about academic performance: thus, 80% of the participants had no idea about what to expect during pandemic specially the majority were students at university of Benghazi which its classes were held

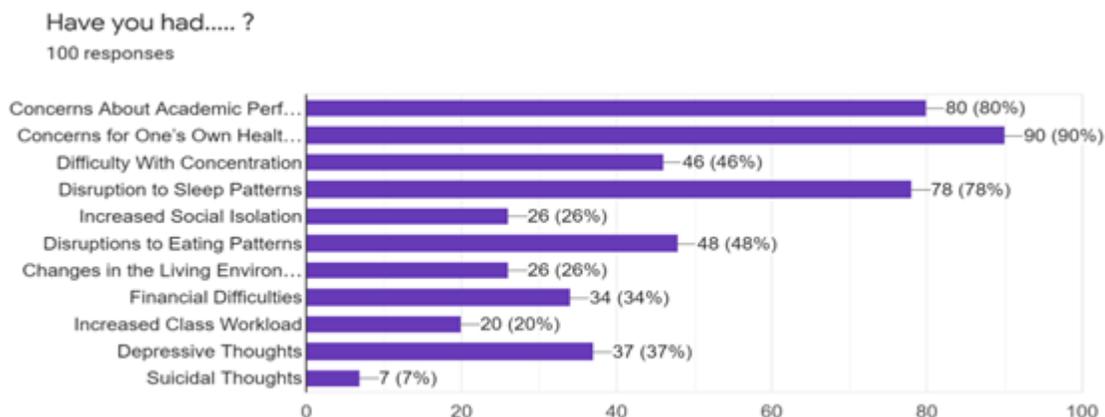
without knowing when to return during or most of 2020. Concerns for one's own health and the health of loved ones: it was expected that to be 100% but it was 90% that was due to some participants who think pandemic was not very dangerous and did not deserve all the hype. Difficulty with concentration: 54% of the participants had no difficulty with concentrations and was due to the relaxation that most of them had during the lockdown. Disruption to sleep patterns: most of the participants had problem with their sleep routine with a percentage of 78%. Increased social isolation: 26% of the participants experienced that and the loose lockdown is the reason for it. Disruptions to eating patterns: 48% of the participants had a problem with their eating pattern, some consumed more food than usual during the lockdown with percentage of 39% and 09% consumed less that reflected on their weight as 38% gained and 15% of the participants lost weight (**Figure 3**).

Financial difficulties (**Figure 3**): some of the participants had some worrying about their financial state. Thus, 17% of the participants were worried because they support their family financially and 29% were worried too but they do not support their family. From the 100 participants, 34% had actual financial difficulties. 12% had lost jobs and 06% of them lost and found another during the pandemic. Increased class workload: 20% had increase class workload and that is because of the full closing of University of Benghazi and most of the students did not use the time of lockdown to study. Changes in the living environment: 26% had a change in their environment. Depressive and suicidal thoughts: from the participants, 37% had different depressive thoughts and 07% had suicidal thoughts.

Coping mechanisms during COVID-19 pandemic: improvement of hygiene, wearing masks and social distancing: thus, 70% of the participants have improved their hygiene and 25% said that their hygiene has already been good. 68% wears masks and 31% wears it sometimes or at least at the first days. 52% of the participants respected the social distancing rules and 44% sometime did social distancing specially in very crowded or closed places. Activities: most of the participants spent their days coping with the pandemic stress by doing different activities, 72% spent extra time on social media and 68% spent it on watching different kind of shows, also 26% of the participated in volunteer work. Others spent it on studying, learning new skills, reading books and training and 15% did nothing but worrying or relaxation. Denial: as it is saw in the charts, some said they have not or

sometimes worn masks, did social distancing or even improved their hygiene and some said the pandemic did not deserve the hype and some did not even had worrying about their own/loved-one's health claiming that the pandemic is not dangerous or even real. Some travelled to see their relatives or friends outside the country (15%).

Others travelled inside the country to see relatives (16%). On the other hand, 69% of the students did not move to anywhere. The participants went out to see friends and relatives everyday (6.1%) or visited them sometimes (69.7%). In contrast, 24.2% of the students did not visit anyone during the loose lockdown.



**Figure 3:** Summary of the challenges to medical students' mental health during COVID-19 pandemic

## Discussion

Medical students represent a population that is considered vulnerable to mental health concerns. The results of this study focus on the effects of pandemic-related stressors on the mental health. The findings suggest a negative impact of COVID-19 pandemic on a variety of academic, health and lifestyle-related outcomes. However, due to the lesser effect of the virus on Libya population which are most of our participants and the loose lockdown in Libya which represent most of our participants. There is also a positive impact of the pandemic as most of the students were relaxed doing different types of activities mostly home activities as watching TV shows. By conducting online survey interviews during April, 2021, the majority of the participants were experiencing multiple problems which increased stress and feeling bored were the highest impacts. Among the effects of the pandemic, the most prominent was worries about one's own health and the health of loved ones, followed by concerns about academic performance and disruption to sleeping pattern, respectively. These findings are in a good line with recent published studies in China [9 - 11] and with USA study [12] that reported concerns related to health of one-self and of family members being highly prevalent among the general population during the pandemic, concern about academic performance, frequently expressed by the participants in current study. In comparison with stress

and anxiety in medical students' general life, it appears that COVID-19 had increased these problems. The findings on the impact of the pandemic on sleeping and eating pattern which have known correlations with depressive symptoms and anxiety [17]. Concerns regarding academic performance were second, this was due to holding the classes, without knowing the future of the academic year and without even continue it online. Unlike other non-Libyan universities which gave options like pass/fail exams or replacing the exams with an online as Egyptian universities and Libyan international medical university which continued it online and self-learning. Unfortunately, about 40% of the participants reported experiencing an increased level of depressive thoughts and only about 10% reported having suicidal thoughts associated with the COVID-19 pandemic. Previous study reported that about 05% of the college student population have suicidal thoughts outside of the pandemic situation [18]. Difficulty with concentration was chosen by about 50% of the students which is lesser than most studies that were conducted [9 - 12]. In particular, difficulty concentrating and changes in sleeping habits are associated with depression [17, 19, 20]. Thus, the current study identifies several coping mechanisms varying between adaptive and mal-adaptive methods. The mal-adaptive as denial and misjudgment have been shown to be significant predictors of depression among young adults [20]. In opposite, adaptive coping as acceptance

and pro-active behaviors are known to positively impact mental health.

The present findings suggest that the majority of the participants if it is going to calculate the participants who did not respect precautionary measures or the participants who used it sometimes, the mal-adaptive coping behaviors will be somehow more. Identifying students' coping behavior is important to inform the planning and design of support systems. For instance, Nastasi and others [21] used a participatory model to develop culture-specific mental health services for high school students in Sri Lanka. In Libya's culture which is the country with most participants, seeking a professional help as psychiatric or social consultant are not common and sometimes it considered a bad in some people's mind. In addition, there are a few people in these sectors to help the community, so participants had several barriers to seek help. However, only one study showed that only a minor fraction of students who screened positive for a mental health problem sought help [22].

### Conclusion

This study indicates that COVID-19 pandemic had positive and negative impacts on medical university students. The fear and the uncertain future of the social lives and academic life of the participants, the changes that happened to their life-style and the multiple death around the world was the reason for the negative psychological problems that most participants had. On the other hand, the positive impact increased more when the days have passed due to adoption and the lesser deaths and the relaxation during loose lockdown which participants were not fully locked in their homes.

### Ethical issues

Including plagiarism, Informed Consent, data fabrication or falsification and double publication or submission have completely been observed by authors.

### Author's contribution

All authors contributed equally and approved the final manuscript.

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### Conflict of interest

The authors have declared no competing interest.

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