



Association between COVID-19 Pandemic Conditions and Perceived Stress Level among College Students in Saudi Arabia

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JPRI/2021/v33i47A33030

Editor(s):

(1) Dr. Rafik Karaman, Al-Quds University, Palestine.

(2) Dr. Ana Cláudia Coelho, University of Trás-os-Montes and Alto Douro, Portugal.

Reviewers:

(1) Gerald Tumusiime, Uganda Christian University, Uganda.

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(3) Siniša Franjić, Croatia.

Complete Peer review History: <https://www.sdiarticle4.com/review-history/76208>

Original Research Article

Received 12 August 2021

Accepted 25 October 2021

Published 27 October 2021

ABSTRACT

Aims: To assess the levels of perceived stress among college students in Saudi Arabia after changing the learning protocols because of covid-19 pandemic.

Study Design: This was a cross-sectional study.

Place and Duration of Study: The study was conducted in Saudi Arabia, from May 2020 to October 2021.

Methodology: A cross-sectional survey study that was carried out in Saudi Arabia. A self-administered, pre-designed questionnaire, including Perceived Stress Scale of 10 items was used to measure the stress levels. The participants were selected randomly from different social media

users who lived and studied in Saudi Arabian universities. In this study, 10-item questions of the Perceived Stress Scale (PSS-10) was used based on a 5-point Likert scale to score each item (0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often).

Results: A total of 2034 students living in Saudi Arabia participated in the study. The results showed that 76.84% of total participants had strong stress, males reported higher score as compared to their Female counterparts. Also, students older than 28 years reported higher level of stress, the students in Qassim region showed highest scores of stress. In addition, excellent academic achievement was strongly associated with high level of stress.

Conclusion: The findings suggest that significant number of students had higher stress levels using the perceived stress scale. Therefore, this cross-sectional study identified a high stress level in COVID-19 crisis among university students in Saudi Arabia.

Keywords: Covid-19; Stress; Learning Protocols.

ABBREVIATIONS

COVID-19: CO' stands for corona, 'VI' for virus, and 'D' for disease. Formerly, this disease was referred to as '2019 novel coronavirus' or '2019-nCoV'

1. INTRODUCTION

Stress is a term that refers to "the sum of physical, mental and emotional strains or tensions on a person when there is a change in life" [1]. For a student, stress may be caused by academic failure, financial problems or health problems. Such events that bring stress are called stressors. A sudden change in life or stressors may affect a person's life style or even his/her physical and mental health. [2]. This crisis started at the end of December 2019 and "COVID-19 virus" became a stressor to all populations. This virus was rapidly spreading from its origin in Wuhan City of Hubei Province of China to the rest of the world [3]. In response to the pandemic, on the 8th of March Saudi government took many precautions such as: self-isolation for arrivals from other countries for 14 days, suspending activities in all life fields including: ministries, universities, schools, mosques, airports, social events, family meeting, etc [4]. On March 11th, WHO (world health organization) declared COVID19 as a pandemic disease [5]. This situation subsequently leads to various stressors revealed to increase the effect on students, such as sudden change in their lifestyle, the method of student's assessment, online courses and exams and postponement of practical parts of the courses [6,7].

A likelihood study done in Saudi Arabia to evaluate the impact that the COVID-19 pandemic had on the psychological well-being of physicians, showed that COVID-19 pandemic

had a negative psychological effect on physicians in Saudi Arabia. Gender, age and previous exposure to similar traumatic events were predictive of psychological reactions to the pandemic in this population [8]. Retrieving knowledge about presence of stress is therefore important to assess the association between COVID-19 pandemic and stress level among college students in Saudi Arabia. The aim of this study was to assess the association between COVID-19 pandemic and stress among college students in Saudi Arabia. Furtherly the stress to Covid-19 in relations to gender, age, social status, area, specialization, academic year, academic evaluation and self-infected [9].

2. MATERIAL AND METHODS

2.1 Study Design

A cross-sectional observational study was carried out in Saudi Arabia. A self-administered, pre-designed questionnaire, including Perceived Stress Scale-10 was used to measure the stress levels.

2.2 Participants

The participants were selected randomly from different social media users living and studying in Saudi Arabian universities. The total students were 162,0491 in all Saudi universities, then Simple random sampling method was used to select minimal sample which was set at 385 students, yet a total of 2597, but were excluded 563 who have visited psychiatrist from participated voluntarily in this research where 47of them have a family infected by COVID-19 and 4 of them infected by COVID-19. All respondents were students with active enrolment in different social media applications. The Table 1 below shows Sample description. The

participants included in this study were: Saudi University students who lived in Saudi Arabia, and had active social media applications. Students who had any psychological disorders or who declined to participate were excluded from the study.

2.3 Instruments

In this study, the level of stress was assessed by a 10-item questions of the Perceived Stress Scale (PSS-10) which uses a 5-point Likert scale to score each item (0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often. The PSS-10 was translated from English to Arabic, then back-translated to make ensure consistency. In previous studies, the PSS-10 was found to have good reliability, showing a Cronbach’s α coefficient above 0.70, even up to 0.91 [10]. So, PSS-10 measures is not limited to certain situations or settings [11].

2.4 Procedures

The PSS-10 was translated into Arabic by the authors. The translated version was then reviewed by the specialized in English language translator and linguistically re-check it by Arabic specialist. The final Arabic versions of the questionnaires were subsequently compared to the original versions. The translated versions of both questionnaires were considered comparable to the originals.

From May 2020 to October 2021, the questionnaires were distributed online via Google Forms to University students in all years of their studies. The authors followed up with each participant to confirm their participation in the study.

2.5 Statistical Analysis

The IBM SPSS Statistics ver. 20.0 software package (IBM Corp., Armonk, USA) was used for analysis. The validity of questionnaire was assessed by Pearson Correlation. The internal consistency validity values ranged between (0.69 – 0.21) and showed statically significant correlations ($\alpha \leq 0.01$) for items .For validity, the Cronbach’s α coefficients and Splite-half alphas (Guttman & Spearman – brown correction) were also calculated to confirm the reliability of the scale. The data distribution was examined and showed acceptable degree of reliability that range between (0.66-0.72) for the total scale items.

3. RESULTS AND DISCUSSION

The level of stress in COVID-19 crisis among university students in Saudi Arabia is 76.84% (M=3.842; SD=0.651), this degree according to Likert scale supposed to be (strong) stress. The stress towards COVID-19 among university students in Saudi Arabia according to gender was assessed using T-test which, showed there is statistically differences between male and female in stress level toward COVID-19 in favor of male ($\alpha \leq 0.01$) [Table 1]

The stress towards COVID-19 among university students in Saudi Arabia according to age was assessed using Kruskal-Wallis test which was showed, no statistically differences in stress level toward COVID-19 in favor of students who are more than 28 years old (Chi-Square $\alpha \leq 0.01$). [Table 2]

Table 1.T-test to determine the significance of differences in stress toward COVID-19 according to gender:(n=2034)

Gender	N	M	SD	T	Sig
Male	626	2.69	0.67	6.33	0.00
Female	1407	2.50	0.62		

Table 2. Kruskal-Wallis of differences in stress toward COVID-19 according to age

Age	N	Mean Rank	Chi-Square	Sig
18-21	1066	983.33	8.47	0.04
22-25	847	1052.17		
26-28	85	1064.30		
>28	35	1076.37		

The stress towards COVID-19 among university students in Saudi Arabia according to social status was assessed, using Kruskal-Wallis test which is showed no statically differences between groups in stress level toward COVID-19 according to social status (Chi-Square $\alpha \geq 0.05$) [Table 3].

The stress towards COVID-19 among university students in Saudi Arabia according to area was assessed using Kruskal-Wallis test, which was showed no statically differences between groups in stress level toward COVID-19 according to the area in favor of Qassim region (Chi-Square $\alpha \leq 0.01$) [Table 4].

The stress towards COVID-19 among university students in Saudi Arabia according to specialization was assessed using One Way ANOVA test which was showed no statistically differences between groups in stress level toward COVID-19 according to their specialization ($F \alpha \geq 0.01$) [Table 5].

The stress towards COVID-19 among university students in Saudi Arabia according to academic year was assessed using Kruskal-Wallis test which was showed no statistically differences between groups in stress level toward COVID-19

according to academic year (Chi-Square $\alpha \geq 0.05$). [Table 6]

The stress towards COVID-19 among university students in Saudi Arabia according to academic evaluation as shown above, there is statically differences between groups in stress level toward COVID-19 according to academic evaluation in favor of (excellent) students (Chi-Square $\alpha \leq 0.05$). [Table 7]

The stress towards COVID-19 among university students in Saudi Arabia according to self-infected was assessed using Mann-Whitney test to determine the significance of differences in stress toward COVID-19 according to self-infected: which was showed, no statically differences between groups in stress level toward COVID-19 according to self-infected ($\alpha \geq 0.05$). [Table 8]

The stress towards COVID-19 among university students in Saudi Arabia according to relative-infected was assessed using Mann-Whitney test, which was showed differences between groups in stress level toward COVID-19 according to relative-infected in favor of groups who haven't relative infected ($\alpha \leq 0.05$). [Table 9]

Table 3. Kruskal-Wallis test to determine the significance of differences in stress toward COVID-19 according to social status

Social status	N	Mean rank	Chi-square	Sig
Unmarried	1893	1014.96	4.57	0.20
Married	132	1019.87		
Divorced	7	1421.21		
Widow	1	1664		

Table 4. Kruskal-Wallis test to determine the significance of differences in stress toward COVID-19 according to area

Area	N	Mean Rank	Chi-Square	Sig
Qassim region	712	1069.06	32.76	0.00
Riyadh region	416	1035.97		
Makkah area	210	993.18		
Tabuk region	178	858.47		
Eastern Province	169	1074.72		
Asser region	114	1001.67		
Medina area	80	900.38		
Al-Jouf Region	40	1022.55		
Al Baha area	39	1008.42		
Jizan region	29	859.45		
Najran region	23	717.07		
Hail region	18	1091.25		
Northern border region	5	986.40		

Table 5. One Way ANOVA test to determine the significance of differences in stress toward COVID-19 according to specialization

Source	Sum of Squares	DF	Mean Square	F	Sig
Between groups	0.261	4	0.065	32.76	0.96
Within groups	849.22	2028	0.419		
Total	849.48	2032			

Table 6. Kruskal-Wallis test to determine the significance of differences in stress toward COVID-19 according to academic year

Academic year	N	Mean Rank	Chi-Square	Sig
First year	450	1016.45	12.46	0.18
Second Year	454	947.54		
Third Year	352	1044.18		
Fourth year	384	1056.80		
Fifth year	186	1036.56		
Sixth year	134	1045.54		
Seventh year	26	888.08		
Eighth year	35	1052.84		
Intern	4	1393.25		
Master	8	1024.94		

Table 7. Kruskal-Wallis test to determine the significance of differences in stress toward COVID-19 according to academic evaluation

Academic evaluation	N	Mean Rank	Chi-Square	Sig
Excellent	851	1043.98	10.66	0.04
Very good	769	1043.76		
Good	356	993.76		
Acceptable	46	840.35		
Weak	11	801.68		

Table 8. Mann-Whitney test to determine the significance of differences in stress toward COVID-19 according to self-infected

Group	N	Mean Rank	Sum of ranks	U	Z	Sig
Uninfected	2029	1017.85	2065224	2337	1.478	0.13
Infected	4	584.25	2337			

Table 9. Mann-Whitney test to determine the significance of differences in stress toward COVID-19 according to relative-infected

Group	N	Mean rank	Sum of rank	U	Z	Sig
Uninfected	1986	1020.98	2027669	38763.5	1.1991	0.04
Infected	47	848.76	39891.5			

4. DISCUSSION

The journey of students in the higher education, may be associated with some sort of stresses, more than one factor can contribute in adding more burden in the student's life. The emergence of COVID19 as an pandemics at the beginning of the year2020 ,has had a great deleterious effects in the world, and as the

students are not in isolation from what can be happened in this universe , this unexpected disaster ,contribute in making additional responsibilities due to change in courses' plan design and methods of students assessment, cancellation or postponement of practical part of the courses and compensation to it by increasing the theoretical assignments, homework and researches, with presence of short deadline for

submitting, fear of unknown future marks distribution, also absence of previous experience for most of students in online classes conduction and facing technical issues in connection with some students, availability of devices and quality of internet connection, all of that might increase the psychological pressure, mental tension and feeling of helplessness. Saudi Arabia is one of a few Country that decided to complete the academic year from homes using online sources of education [7]. Arguably this study can be considered as the first study to measure the level of stress among university students in Saudi Arabia during COVID-19 pandemic, which showed strong stress level (Table (3)). In concordance with this study, a similar study conducted on Chinese population, aiming to get a better understanding of the levels of psychological impact, anxiety, depression, and stress during the first wave of the COVID-19 outbreak showed that, more than half of the respondents rated the psychological impact as moderate-to-severe, and about one-third reported moderate-to-severe anxiety [8]. Another study done in Saudi Arabia to evaluate the impact that the COVID-19 pandemic had on the psychological well-being of physicians, showed that COVID-19 pandemic had a negative psychological effect on physicians in Saudi Arabia. Gender, age and previous exposure to similar traumatic events were predictive of psychological reactions to the pandemic in this population [9]. This study can be considered a unique one, as it covered and showed the relation of stress during this catastrophe with more than one element in the student's life (age, gender, marital status, academic, residency area, infection with the virus etc.). According to this study, gender had statistically significant difference between males and females in stress level toward COVID-19 in favor of males. Male students showed higher level of stress in comparison with female students (Table 4), whereas previous researches have shown the opposite results [12,13,14,15,16]. at the time of conducting the survey, the total number of confirmed cases of COVID-19 in Saudi Arabia was significantly in favor of male, the higher prevalence of stress could be related to the fact that COVID-19 is more fatal in males than in females in many parts of the word. [17,18,19]. The--Global Health 50/50 research collected COVID-19 sex-disaggregated data tracker from official governmental sources countries worldwide, that demonstrating similar morbidity between women and men, but showed an increased in mortality in men [20]. In addition,

this study reported significant differences in stress level favoring students who are more than 28 years old (Table 5) It may be because of vulnerability of disease in elderly, according to WHO, COVID-19 vulnerability is higher in people who are older in age or have health conditions [21]. In addition, a young population more dealing with smartphone application which could provide online psychotherapy support, meditation classes, entertainment games and good formal sources of information about the disease [22]. The study didn't show a significant difference in stress level among health fields students comparing to other specialties, whereas previous researches have shown the opposite results [15-16] ,this is might be because of reduction in physical load by cancellation or postponement of practical/clinical requirements and compensated by online lectures instead of physical onsite presence which is relatively easier also it might be provide more sleeping hours for them. [Table 3]

For the reason or other, Qassim area, which is located in the central part of KSA, according to this study Showed high level of stress comparing to the other parts of Saudi Kingdom. [Table 4] The students with excellent academic evaluation reported scientifically higher level of stress table 9, This is in agreement with previous studies which have categorized stressors into three major groups and the academic achievement was one of these groups [23,24]. On the other hand, the study displayed no significant increase in stress level among students who got infected with COVID-19, and also students whose families got infected compared to students who did not. This may be due to the perception that there is long-lasting immunization after the recovery from the disease. Unfortunately, longer-term immunity is not well documented [25].

Finally, this study did not find any significant association between the student's social status as well as the students' level in academic years with the stress level.

5. CONCLUSION

This cross-sectional study identified a high stress level in COVID-19 crisis among university students in Saudi Arabia. Differences in stress level according to different situations were reported, the highest stress levels were concentrated in male gender, and in those with academic evaluation, as well as students who

lived and studied in Qassim region. On the other hand, there were no statistically significant differences according to social status specialization, academic year, and whether the student or his / her family member had been infected with COVID-19 or not.

CONSENT AND ETHICAL APPROVAL

This study was approved by the Research Ethical Committee in Qassim University (No. EA/F-2020-4001). Institutional research ethics board approval was acquired before conducting any study-related procedures. Informed consents were obtained from all individual participants included in the study. A statement was included at the beginning of the questionnaire clarifying that the participation in this study is voluntary and that collected data will be anonymous and will only be used for this study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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<https://doi.org/10.1371/journal.pone.0244126>

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Peer-review history:

The peer review history for this paper can be accessed here:
<https://www.sdiarticle4.com/review-history/76208>