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# Effect of COVID-19 Pandemic on Physical and Mental Health of College/University Students in Riyadh

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**Abstract**
Due to lockdown in COVID-19 health, mental and economic effects were observed in students. COVID-19 has a great impact on people's lifestyles, education, eating behaviors and physical activity. Individuals were also less physically involved, more sedentary and more depressed, which may pose severe protection and well-being risks. The aim of this present study was determine the impact of the COVID-19 pandemic on the physical and mental health of Riyadh medical students. This study was single-center, prospective Cross-sectional study, conducted in College of Medicine, Dar Al Uloom University, Riyadh, Kingdom of Saudi Arabia during1st January, 2022 to 15st January 2022. In present study, 171 students were participated. 105(61.4%) of participants were female and 66(38.6%) were male. Mejority of 164(95.9%) of participants were between 18-28 years old. There was significant association between physically active participants and before COVID-19 and during COVID-19 (P=0.023). During the pandemic more participants practice physical activity alone 89(52%) during the pandemic, whereas 78(45.6%) before pandemic. With friends decreased from 39(22.8%) before pandemic to 17(9.9%) during pandemic. Participant's physical activity was decreased during covid 19 as compared to before COVID-19. Also during COVID-19 pandemic frequency of physically active participants this percentage was reduced as compared to before COVID-19. Around 19.9% of participant's weight was gained during COVID-19. As per PHQ-9 depression severity score 66.1% participants were having dipression.

## INTRODUCTION

COVID-19, caused by the SARS-CoV-2 virus, typically leads to mild to moderate respiratory illness in most individuals, with the majority recovering without specialized treatment[1]. The first documented cases of COVID-19 emerged on December 31, 2019, when the World Health Organization (WHO) was alerted to pneumonia cases in Wuhan, China, of unknown origin. By January 7 2020, Chinese authorities identified a new corona virus, initially termed 2019-nCoV, as the culprit. In the early stages of the pandemic, global health authorities, governmental bodies and the public grappled with uncertainty regarding the disease's transmission and its impact on daily life, particularly due to the absence of effective treatments[2].

The imposition of COVID-19 lock downs brought about notable repercussions on health, mental well-being and the economy. These effects extended to people's lifestyles, encompassing remote education, eating habits, and physical activity[3,5]. Reduced physical activity directly contributed to changes in body weight, with a significant increase in body weight and BMI observed in the adult population post-lockdown[5]. Prolonged periods of physical inactivity and sedentary behavior during home confinement were found to have adverse consequences on overall well-being and quality of life. The widespread implementation of lockdown policies generated numerous psychological and physical challenges across various aspects of people's lives. Home confinement had lasting psychological effects, leading to emotions such as anger, boredom and loneliness, which, in turn, increased the incidence of mental health issues such as depression, stress and anxiety. The negative impact on mental health and quality of life among adults was evident. Home isolation had adverse socio-psychological effects, encompassing negative emotions, cognitive decline and discomfort. Restrictions on travel and outdoor leisure disrupted people's daily routines and lifestyles, resulting in reduced physical activity, increased sedentary behavior and heightened levels of depression, posing significant challenges to protection and well-being[6].

The COVID-19 outbreak had a severe impact on the mental and physical health of medical students. Their emotional well-being suffered due to the demanding transition to online learning, leading to feelings of loneliness and apprehension about their future, graduation prospects and the quality of their education. Existing evidence indicates that university closures had detrimental psychological consequences for students, particularly medical students who faced unique concerns regarding patient interaction, knowledge acquisition and involvement in pandemic containment efforts. Consequently, medical students have been extensively studied in this context[6]. Subsequent statistics on the psycho social well-being of medical students underscored the negative impact of the pandemic on this group. Fears and uncertainties related to their education, compounded by widespread lockdowns and economic hardships, raised concerns about rising suicide rates[6]. Closure of educational institutions in 150 countries took a toll on the mental health of nearly 80% of the global student population, as indicated by previous research. In an effort to mitigate these challenges, Saudi Arabia took the step of suspending schools and universities on March 11th, transitioning to online learning[1].

**Aim and Objective of Study:** This research aims to assess the influence of the COVID-19 pandemic on the physical and mental health of medical students in Riyadh. Additionally, it seeks to evaluate and establish connections between changes in physical and mental health before and after the pandemic. Furthermore, the study aims to provide strategies for coping with the physical and mental repercussions of the pandemic.

## MATERIALS AND METHODS

The present study is a single-center, prospective cross-sectional study conducted at the College of Medicine, Dar Al Uloom University, Riyadh, Kingdom of Saudi Arabia. The study involved students from the College of Medicine, Dar Al Uloom University, Riyadh, from January 1, 2022-January 15, 2022. Ethical approval for the study was obtained from the institutional ethical committee.

**Inclusion Criteria:**

- All university/college students in Riyadh of both gender and age-group.
- Student giving informed consent.

**Exclusion Criteria:** Student with attendance <seventy percent.

The data was collected with the help of an already standardized questionnaire (21) after obtaining the permission from concerned author. The demographic data of the respondents was collected without revealing the identity of respondents. The teaching and learning process adopted after the covid 19- lock down in Kingdom of Saudi Arabia was focused. (IRB) of College of Medicine, Dar Al Uloom University and other required authorities. The data was collected online with the help of Microsoft forms /Google form. The students were sent the forms using emails/ what's App/SMS/ compatible social media.

**Statistical Analysis:** Data was collected and compiled using Microsoft Excel, analysed using SPSS 23.0 version. Frequency, percentage, means and standard deviations (SD) was calculated for the continuous

variables, while ratios and proportions were calculated for the categorical variables.

## RESULTS AND DISCUSSIONS

In present study, 171 students were participated. 105(61.4%) of participants were female and 66(38.6%) were male. Mejority of 164(95.9%) of participants were between 18-28 years old.

There was not significant association between comorbid Diseases of participants and before COVID-19 and during COVID-19 (P=0.329).

(Table 3) shows three categories of participants active, moderately active and not active before and during COVID-19 pandemic. 58(33.9%) of participants were not active before COVID-19 and during the COVID-19 pandemic not active participants significantly increase up to 80(46.8%). There was significant association between physically active participants and before COVID-19 and during COVID-19 (P=0.023).

(Table 4) shows the comparison of how often participants were active before and during the COVID-19 pandemic. Participants who were active 2 or more time per week were 106(63%) before pandemic of COVID-19, whereas, during COVID-19 pandemic this percentage significantly reduced to 91(53.2%). There was significant association between frequency of physically active participants and before and during COVID-19 (P=0.043).

(Table 5) shows weight gain during the lockdown period. 34(19.1%) of participants weight gained during lockdown period. Mejority 18(10.5%) of participants weight gained during 6-10 kg. Whereas 04(2.3%) of participants weight gained more than 10kg.

Household work such as cleaning and cooking increased significantly during the COIVD-19 pandemic from 14(8.2%) before the pandemic to 26(15.2%) during the pandemic. Whereas workplace activity such as going to the university have drop significantly from 55(32.2%) before the pandemic to 23(13.5%) during the pandemic. There was significant association between physical activity have you done on a regular basis participants and before COVID-19 and during COVID-19 (P=0.0014).

(Table 7) shows comparison of where participants where primarily physically active before and during COVID-19 pandemic. During the pandemic being active primary at home increased significantly from 39(22.8%) before the pandemic to 78(45.6%) during the pandemic. However, at workplaces or at college decreased significantly from 44(25.7%) before the pandemic to 15(8.8%) during the pandemic. Also being physically active in sport and fitness centres decreased from 48(28.1%) before the pandemic to 33(19.9%) during the pandemic.

(Table 8) illustrates with whom participants practice physical activity before and during COVID-19 pandemic. During pandemic more participants practice physical activity alone 89(52%) during the pandemic, whereas 78(45.6%) before the pandemic. With friends decreased from 39(22.8%) before the pandemic to 17(9.9%) during the pandemic.

(Table 9) shows percentage of participants who started any physical activity during the lockdown. 85(49.7%) started new physical activity. 84(49.1%) started exercising in home during the lockdown.

(Table 10) shows the important factors for whether the participants were physically active during the shutdown. The mejority of participants 32(18.7%) said they luck time or will use time in something else followed by 25(14.9%) said they don't feel like it.

(Table 11) shows the result of PHQ-9 depression severity score. 58(33.9%) has no to minimal depression. 52(30.4%) of participants has mild depression. 27(15.8%) has moderate depression. 22 (12.9% ) has moderately severe depression. 12(7%) has severe depression.

There was not significant association between Gender and PHQ-9 score classification (P=0.70). Also there were not significant association between age-group and PHQ-9 score classification (P=0.50).

In this present study, 171 students were participated. Mejority of 61.4% of participants were female and 38.6% were male. Maximum 95.9% of participants were between age-group 18-28 years. The mean age of present study paticipants was 24.73±4.65 years. Simillar age-group was observed by Gewalt[7] 23.01±4.08 years of university students. Son[8] reported the mean age was 20.7±1.7 years.

The hyperlipidaemia has shown a marginal increase during COVID-19 but most of the comorbid conditions did not shows increase and there was not significant difference of comorbid Diseases of participants in before COVID-19 and during COVID-19 (P=0.329).

In present study 58(33.9%) of participants were not active before COVID-19 and during the COVID-19 pandemic not active participants significantly increase up to 80(46.8%). There was significant association between physically active participants and before COVID-19 and during COVID-19 (P=0.023). The mejority of participants 32(18.7%) said they luck time or will use time in something else followed by 25(14.9%) said they don't feel like it.

As per the literature, social context is one of the most influential factors for engagement in different aspects of physical activity. When people are with their friends or family, they are more likely to be involved in physical activity. In the COVID-19 lockdown, staying at home has disrupted routine daily activities of peoples[9]. In our study during the pandemic more participants practice physical activity alone 89(52%) during the pandemic, whereas 78(45.6%) before the pandemic. Simillar findings of Faisal A Barwais[9] found that who participated in physical activity alone, with

**Table 1: Demographic profile of patients**

| | | No. of participant [n=171] | Percentage |
|---|---|---|---|
| Gender | Male | 66 | 38.6 |
| | Female | 105 | 61.4 |
| Age-Group | 18-28 | 164 | 95.9 |
| | 29-38 | 04 | 2.3 |
| | 39-48 | 02 | 1.2 |
| | 49-58 | 01 | 0.6 |
| | Mean±SD | 24.73±4.65 years | |

**Table 2: Comparison of Comorbid Diseases in participants before and during COVID-19.**

| Comorbid Diseases | Before COVID-19 | During COVID-19 | Chi-square | | value | P-value |
|---|---|---|---|---|---|---|
| | NO | percent | NO | percent | | |
| Resperatory Disease | 12 | 7.0 | 5 | 2.9 | 3.29 | P=0.329 NS |
| Diabetes | 4 | 2.3 | 4 | 2.4 | | |
| Hypertension | 1 | 0.6 | 2 | 1.2 | | |
| Hyperlipidemia | 2 | 1.2 | 5 | 2.9 | | |
| Heart Diseases | 2 | 1.2 | 3 | 1.8 | | |
| No any Diseases | 151 | 88.3 | 153 | 89.5 | | |

**Table 3: Comparison of physically active of participant in before and during COVID-19**

| physically active | Before COVID-19 | | During COVID-19 | | Chi-square test | P-value |
|---|---|---|---|---|---|---|
| | No | percent | No | percent | | |
| Active | 39 | 22.8 | 40 | 23.4 | 7.75 | P=0.023 S |
| Moderatly active | 74 | 43.3 | 51 | 29.8 | | |
| Not active | 58 | 33.9 | 80 | 46.8 | | |
| Total | 171 | 100.0 | 171 | 100.0 | | |

**Table 4: Comparison of Frequency of physically active of participant in Before and during COVID-19**

| Frequency of physically active | Before COVID-19 | | During COVID-19 | | Chi-square test | P-value |
|---|---|---|---|---|---|---|
| | No | percent | No | percent | | |
| 1 time per week | 29 | 17.0 | 40 | 23.4 | 4.89 | P=0.043 S |
| 2-4 times per week | 76 | 45.5 | 57 | 33.3 | | |
| 5 times per week or more | 30 | 17.5 | 34 | 19.9 | | |
| Rarly/never | 36 | 21.1 | 40 | 23.4 | | |
| Total | 171 | 100 | 171 | 100 | | |

**Table 5: Weight Gain during lockdown of COVID-19**

| | No | percent |
|---|---|---|
| Gained 1-5kg | 12 | 7.0 |
| Gained 6-10kg | 18 | 10.5 |
| Gained more than 10kg | 4 | 2.3 |
| No weight gain | 137 | 80.1 |
| Total | 171 | 100.0 |

**Table 6: Comparison of types of physical activity done on a regular basis in before and during COVID-19**

| | Before COVID-19 | | During COVID-19 | | Chi-square test | P-value |
|---|---|---|---|---|---|---|
| | No | percent | No | percent | | |
| House hold work (Cleaning cooking etc) | 14 | 8.2 | 26 | 15.2 | 22.26 | P=0.0014 S |
| Outdoor activities (hiking, cycling) | 21 | 12.3 | 28 | 16.4 | | |
| Team ball games (Football, vollyball and baskt ball ) | 29 | 17.0 | 21 | 12.3 | | |
| Water related activities (swimming, diving) | 10 | 5.8 | 14 | 8.2 | | |
| Work place activity (Going to job/college/university etc) | 55 | 32.2 | 23 | 13.5 | | |
| Other activities | 24 | 14.0 | 32 | 18.7 | | |
| No Active | 18 | 10.5 | 26 | 15.2 | | |
| Total | 171 | 100.0 | 171 | 100.0 | | |

**Table 7: Comparison of primarily been physically active in Before and during COVID-19.**

| primarily been physically active | Before COVID-19 | | During COVID-19 | | Chi-square test | P-value |
|---|---|---|---|---|---|---|
| | No | percent | No | percent | | |
| At home | 39 | 22.8 | 78 | 45.6 | 30.49 | P<0.0001 S |
| At work places or School/ colleges | 44 | 25.7 | 15 | 8.8 | | |
| Sport and fitness centers | 48 | 28.1 | 33 | 19.9 | | |
| Other | 18 | 10.5 | 20 | 11.7 | | |
| Not active | 20 | 11.7 | 24 | 14.0 | | |
| Total | 171 | 100.0 | 171 | 100.0 | | |

**Table 8: Comparison of mostly physically active with in Before COVID-19 & during COVID-19**

| mostly physically active with | Before COVID- 19 | | During COVID-19 | | Chi-square test | P-value |
|---|---|---|---|---|---|---|
| | No | percent | No | percent | | |
| Alone | 78 | 45.6 | 89 | 52.0 | 15.26 | P=0.0093 S |
| With family | 22 | 12.9 | 29 | 17.0 | | |
| With colleages | 9 | 5.3 | 2 | 1.2 | | |
| With friends | 39 | 22.8 | 17 | 9.9 | | |
| With people I do not know | 4 | 2.3 | 4 | 2.3 | | |
| Not active | 19 | 11.1 | 24 | 14.1 | | |
| Total | 171 | 100.0 | 171 | 100.0 | | |

**Table 9: started any new physical activity during the lockdown**

| | No | percent |
|---|---|---|
| No new physical activity | 85 | 49.70 |
| started exercising in home | 84 | 49.10 |
| other physical activity | 2 | 1.20 |
| Total | 171 | 100.0 |

**Table 10: Which factors are important for whether you are physically active during the shutdown**

| | No | percent |
|---|---|---|
| Do not feel like it | 25 | 14.6 |
| Do not feel safe going outside my home | 9 | 5.3 |
| Do not have access to the right facilities | 8 | 4.7 |
| Lack someone to do physical activity with | 6 | 3.5 |
| Lack time/ use time in somthing else | 32 | 18.7 |
| Miss what I used to do | 17 | 9.9 |
| Other. | 19 | 11.1 |
| None | 55 | 32.2 |

**Table 11: PHQ-9 Score classification**

| PHQ-9 Score classification | No | percent |
|---|---|---|
| None-minimal [0-4] | 58 | 33.9 |
| Mild [5-9] | 52 | 30.4 |
| Moderate [10-14] | 27 | 15.8 |
| Moderately severe [15-19] | 22 | 12.9 |
| Severe [20-27] | 12 | 7.0 |
| Total | 171 | 100.0 |

**Table 12: Demographic profile of patients**

**PHQ-9 Score classification**

| | | None- minima l [0-4] | Mil d [5-9] | Moderat e [10-14] | Moderatel y Severe [15-19] | Sever e [20-27] | Tota l | Chi- squar e value | p-value |
|---|---|---|---|---|---|---|---|---|---|
| Gende r | Male | 29 | 19 | 10 | 6 | 2 | 66 | | 8.95P=0.70 6 NS |
| | Female | 29 | 33 | 17 | 16 | 10 | 105 | | |
| Age- Group | 18-28 | 55 | 50 | 26 | 22 | 11 | 164 | 19.39 | P=0.50 2 NS |
| | 29-38 | 1 | 1 | 1 | 0 | 1 | 4 | | |
| | 39-48 | 2 | 0 | 0 | 0 | 0 | 2 | | |
| | 49-58 | 0 | 1 | 0 | 0 | 0 | 1 | | |

family, with friends, or with groups experienced a statistically significant decline during the COVID-19 lockdown, becoming insufficiently physically active when compared to before the lockdown.

In present study, during the pandemic being active primary at home increased significantly from 39(22.8%) before the pandemic to 78(45.6%) during the pandemic. However, at workplaces or at college decreased significantly from 44(25.7%) before the pandemic to 15(8.8%) during the pandemic. Also being physically active in sport and fitness centres decreased from 48(28.1%) before the pandemic to 33(19.9%) during the pandemic. Simillar findings were observed by Hamed[10] that before COVID-19, mejority 112(25.9%) participants exercised at home/neighborhood, 65 (15%) participants exercised at a fitness center, while 57 (13.2%) and 19 (4.4%) exercised outside and in other locations respectively, while 96 (22.2%) did not exercise. On the other hand, during COVID-19, the simillar trend was observed that, mejority of individuals would exercise at home/neighborhoods, followed by no exercise and other locations.

In our study 34(19.1%) of participants weight gained during lockdown period. Yang[11] conducted study in United States, for comparing the obesity prevalence between the pre-pandemic and pandemic periods, overall obesity prevalence increased from 13.7%-15.4%. Androutsos, O et al conducted a study in children's and adolescents' lifestyles during lockdown in Greece, found that 35% of parents reported an increase in body weight among their children[12]. These studies propose that pediatric obesity was aggravated during the COVID-19 pandemic era.

In present study PHQ-9 depression severity score was used, 58(33.9%) has no to minimal depression. 52(30.4%) has mild depression. 27(15.8%) has moderate depression. 22(12.9%) has moderately severe depression. 12(7%) has severe depression. Whereas Cemil Örgev *et al* repoted that, 90.5% of

student's anx-iety level was increased during the pandemic period. Where as the prevalence of anxiety was observed in 38% of students during the COVID-19 pandemic in Iranian medical students[13]. Also Cao W et al conducted study in Chinese medical students, the rate of anxiety thought to be caused by the COVID-19 pandemic was 24.9%[14].

## CONCLUSION

Present study found that, participant's physical activity was decreased during COVID-19 as compared to before COVID-19. Also during COVID-19 pandemic frequency of physically active participant's percentage was reduced as compared to before COVID-19. Weight gain was observed in 19.9% of participants during COVID-19. During COVID-19 pandemic participants were prefeerred to do physical activity at home. One of the most influential factors on people's choice and engagement in different aspects of physical activity is the social context. When people are with their friends or family, they are more likely to be involved in physical activity. As per PHQ-9 depression severity score 66.1% participants were having dipression. So during normalization process in universities, students should be given psychological support and also try to involve students in extra-curricular and sports activities and also preventive measures should be taken.

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