



## ORIGINAL ARTICLE

## Covid-19 Pandemic: Perspectives of Preclinical Medical Students and Effects on Their Lifestyles

Nevin Yılmaz<sup>1\*</sup> , Ayşe Mısırlı<sup>2</sup> , Dilara Kışaçam<sup>2</sup> , Ecem Ersözluoğlu<sup>2</sup> , Görkem Becer<sup>2</sup>  and Sıdıka Nur Kardeş<sup>2</sup> 



<sup>1</sup>Internal Medicine/Gastroenterology, Eastern Mediterranean University Faculty of Medicine, Famagusta TRNC, Turkey

<sup>2</sup>1st Year Students, Project Group-2, Eastern Mediterranean University Faculty of Medicine, Famagusta TRNC, Turkey

\*Corresponding author: Prof. Dr. Nevin Yılmaz, Internal Medicine/Gastroenterology, Eastern Mediterranean University, Famagusta, North Cyprus via Mersin 10, 99628, Turkey, Tel: 0-392-630-11-11, Fax: 0-392-630-3025

### Abstract

**Introduction and aim:** COVID-19 has appeared in Wuhan in December 2019. It has become an epidemic, leading to the transition to online education in medical schools, and students have been affected in some way by the pandemic. This study aimed to investigate perspectives of Eastern Mediterranean University (EMU) preclinical medical students on COVID-19 and its effects on their lives.

**Material and method:** EMU year 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> students (N = 154) were included in the voluntary cross-sectional survey. The questionnaire consisted of 24 questions in English and Turkish investigating "sociodemographic features", "perspective" and "lifestyles", shared with the participants via Google Forms and Microsoft Teams with the "consent form", SPSS-26.0 was used for analysis.

**Results:** The sample size was 109 (response rate is 99% in the sample calculated with 95% CI) with 64.2% females ( $\chi^2$ ,  $p = 0.0045$ ) with a mean age of  $20 \pm 1.4$ , 9.2% ( $n = 10$ ) of the students had the COVID-19 virus and 30% ( $n = 3$ ) had their first symptom as headache. 78% ( $n = 85$ ) thinks vaccine would be the solution and staying at home 59% ( $n = 64$ ) was the best prevention method, 64.2% ( $n = 70$ ) find medical journals reliable on COVID-19 data. The biggest concern about COVID-19 among students is their family and their own health with 48.6% ( $n = 53$ ). 68.8% ( $n = 75$ ) reported a decrease in school performance ( $\chi^2$ ,  $p < 0.0001$ ). Due to COVID-19, 32.1% ( $n = 35$ ) of students reported a change in diet 25.7% ( $n = 28$ ) increase in physical activity, 32.1% ( $n = 35$ ) faced with worsening mood, and 53.2% ( $n = 58$ ) of the students didn't feel happy during the pandemic.

**Conclusion:** It was concluded that the preclinical medical students in the pandemic didn't find daily COVID-19 data reliable, best prevention method was staying at home and

pandemic didn't affect their lifestyle very much, but despite the fact that about half of the students felt good, many students' school success decreased due to COVID-19.

### Keywords

COVID-19, Medical students, Perspectives, Pandemic

### Introduction

The novel coronavirus has appeared at the end of December of 2019, in Wuhan city of China [1]. It spread rapidly and affected other regions of China [2]. The first symptoms were mostly fever, cough and weakness. Additional symptoms reported contained headaches, sore throat, rhinorrhea, shortness of breath myalgia, diarrhea and nausea [3]. The researches have showed that it can be spread by both direct routes, human to human transmission, and indirect contact, contaminated objects and air bone contamination. The person to person transmission occurs mainly through respiratory droplets when a patient coughs or sneezes. On the other hand, indirect contact could occur if a person touches a surface that contaminated with COVID-19 and then hands come into direct contacts with mucous membranes such as eyes, nose or mouth [4].

Authority in Wuhan took lots of measures to prevent the spreading of the coronavirus. However; in the meantime, it has become a global epidemic. Within a few weeks, some cases were detected in several countries and it became global threat [5]. As a result,

World Health Organization (WHO) has declared that the coronavirus epidemic is pandemic on March 2020 [6]. In Turkey and North Cyprus first cases were declared on March 10, 2020 [7]. At the end of the March, virus spread in countries over 177. It infected 722,435 patients and it resulted in 33,997 death as of March 29 [8]. The most affected countries were China, Europe, Iran, South Korea and USA [9].

Lots of countries took strict measurements in order to prevent spreading of COVID-19. They introduced travel restrictions [10]. As in most countries in the world, it is stated that people should not venture out unless it is necessary to prevent or minimize the spread of the virus. Besides, people are not allowed to enter some metropolitan cities except in mandatory situations [11]. Authorities took several measurements that included health facilities to control the disease, social distancing, quarantine and self-isolation as well [10]. Furthermore; museums, gyms, cinemas, swimming pools and places with large gatherings closed. Efforts to reduce spreading of COVID-19 virus caused closure of schools, colleges, universities and educational institutions. As a result; it affected 80% of student in the world. Universities were suspended on March 12, 2020 in Northern Cyprus. On March 16, it was announced that there would be no in-person teaching at universities in the remainder of the spring semester, and that they would continue with remote education only. Because of this situation universities have either postponed or canceled campus facilities to maintain lectures with less loss.

In this pandemic it is clear that it has deep effects on quantity of social life, mental and physical health and also academic careers of medical students. There are very few studies on this subject among university students, especially among medical students, investigating the effects of the COVID-19 pandemic on their lives and their suffering of the pandemic. These studies have reported the impact on medical student education of COVID-19 [12], impact on mental health of students [13] and attitudes, anxiety, and behavioral practices regarding COVID-19 [14]. However, we could not find a study that included the current pandemic, especially the perspectives, concerns, etc. of preclinical medical students.

This study aims to investigate perspectives of Eastern Mediterranean University (EMU) preclinical medical students on COVID-19 and its effects on their lives under the following two main headings.

- 1) What are the preclinical medical students' experiences of COVID-19, their views and concerns about the disease?
- 2) What are the effects of the pandemic on the lifestyle of these students?

Our study will be the first original online survey on this subject in Northern Cyprus.

## Materials and Methods

A cross-sectional questionnaire-based online survey study is being carried out among Year 1, 2 and 3 students in EMU, Famagusta, North Cyprus. It is being conducted between September 2020 and May 2021. EMU medical faculty is 6 years and the first 3 years are studying in North Cyprus.

EMU Medicine students who were studying in 2020-2021 spring terms were included the study about the perspectives of EMU pre-clinical medical students on COVID-19 and its effects on students life. The whole students are used as samples, including all female and male genders; first, second, and third-year students that are from 15 different countries and different continents.

In this cross-sectional study, a Google Form made questionnaire is being distributed among first, second, and third-year EMU medical students via personal email accounts which was available from February until March 2020. The sample size is 154 students. Population size was accessed by the EMU website [medicine.emu.edu.tr](http://medicine.emu.edu.tr).

The preparation of the questionnaires was done by 1<sup>st</sup> Year Students-Project Group-2 designed by adviser. The questionnaire included 24 questions which were asked in three parts.

In the first section, the participants were asked to provide their personal information regarding their age, gender, class year, and their nationality.

In the second section they are being asked to complete Experiences & Ideas & Concerns about COVID-19 which measured their knowledge of COVID-19 precautions and dealing processes. Also, participants were assessed on their knowledge about COVID-19, their health effects, and the concerns about their future.

Furthermore, in the third section they were asked to share their COVID-19; life influences (basic & educational & social), the result of which was then analyzed quantitatively (full questionnaire is given in the [Appendix](#)).

The Statistical analysis of the data was performed using social sciences program software (SPSS V26). The statistics including the standard deviation, number, and percentile values were calculated and a frequency analysis was performed. Since some questions included a conditional statement, some of the percentage values were calculated using only the number of respondents answering those specific questions. Generally, since the data was categorical Chi-square tests and a two-sample t-test is applied.

It should be noted that the appropriate ethical standards were used when carrying this study. Every participant was given the option of giving up the study at any stage since every participant signed a research-informed consent. The personal information of participants including name, age, gender, and nationality are kept anonymized and are not shared with any other person or entity outside of this study.

**Table 1A:** Age, gender and grade of the students, N = 109.

Parameters	Results	P value
Age, Mean $\pm$ SD	20.05 $\pm$ 1.468	
Gender, N, %		
• Female	<b>70 (64.2%)</b>	<b>0.0045</b>
• Male	39 (35.8%)	
Grade, N, %		
• I	41 (37.6%)	0.110
• II	<b>42 (38.5%)</b>	
• III	26 (23.9%)	

**Table 1B:** Nationality, N = 109.

Nationality, N, %	P value
Turkish	<b>43 (39.4%)</b>
Turkish Cypriot	<b>35 (32.1%)</b>
German	4 (3.7%)
Iranian	7 (6.4%)
Jordanian	7 (6.4%)
Syrian	3 (2.8%)
Nigerian	2 (1.8%)
Iraqi	1 (0.9%)
Egyptian	1 (0.9%)
Bahrain	1 (0.9%)
Omani	1 (0.9%)
Uzbekistan	1 (0.9%)
Double nationality	3 (2.8%)

rate is 99% in the sample calculated with 95% CI) were surveyed in this study. The mean age was 20.05  $\pm$  1.4 years. Female participants of our survey were more than the male participants ( $p = 0.0045$ ). 70 of the participants were female which constituted 64.2% of the participants and the remaining 39 students were male which made 35.8% of the population. 41 first year students made up 37.6% of the population, 42 second year students made up 38.5% and the remaining 26 students were in their third year which constituted 23.9% of the students surveyed ( $p = 0.110$ ), [Table 1A](#). The most common nationalities were Turkish nationals with 39.4% of the students followed by TRNC nationals with 32.1% of the population ( $p < 0.0001$ ) ([Table 1B](#)).

### COVID-19: Experiences & ideas & concerns

Data on COVID-19; experiences & ideas & concerns were summarized in [Table 2A](#), [Table 2B](#), [Table 3](#), [Table 4](#), [Figure 1](#), [Figure 2A](#) and [Figure 2B](#). Of the 109 surveyed EMU preclinical medical students, 9.2% ( $n = 10$ ; 6 female) mostly Turkish ( $n = 5$ ) 2 citizens of Cyprus infected with COVID-19 virus and the remaining 90.8% did not ( $p < 0.0001$ ). Among the students who got COVID-19 virus, most of them ( $n = 6$ ; 60%) was from the second-

## Results

### Demographics of the students

A total of 109 EMU medical students (response

**Table 2A:** Did you get the COVID-19 virus? N = 109.

Parameters	Yes	No	P Value
Get COVID-19	10 (9.2%)	<b>99 (90.8%)</b>	<b>&lt; 0.0001</b>
• First Year	3 (30%)	38	0.305
• Second Year	<b>6 (60%)</b>	36	
• Third Year	1 (10%)	25	
o Male	4 (40%)	35	0.770
o Female	<b>6 (60%)</b>	64	

**Table 2B:** What was the first onset symptom? N = 10.

If the answer is yes, what was your the first onset symptom? N = 10	P value
Inability to smell/taste	0.849
<b>2 (20%)</b>	
Fever	
<b>2 (20%)</b>	
Muscle pain	
1 (10%)	
Asymptomatic	
1 (10%)	
Cough	
1 (10%)	
Headache	
<b>3 (30%)</b>	

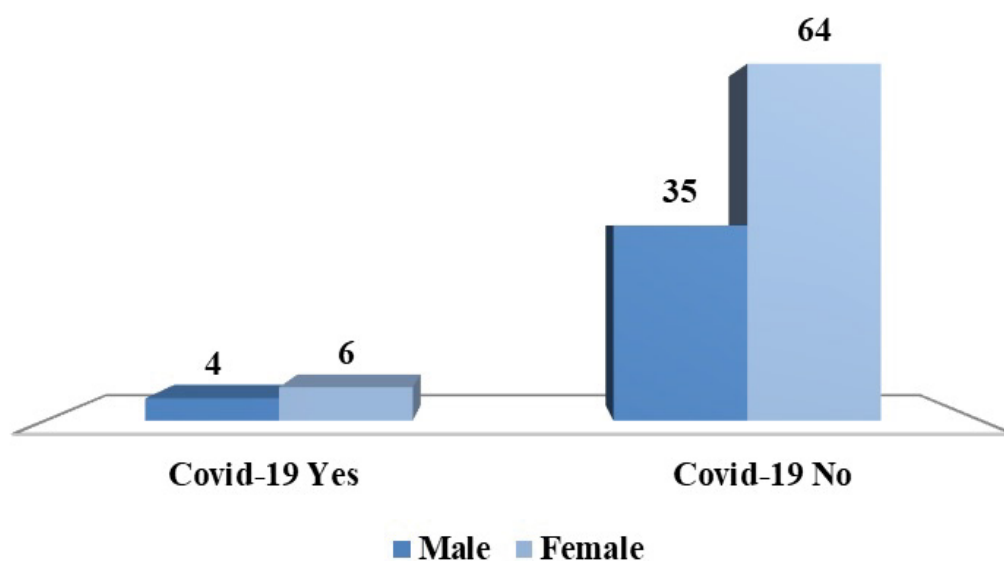
year student ( $p = 0.305$ ) and there was no significant difference between genders and grades (Female  $n = 6$ ,  $p = 0.770$ ), (Table 2A). The first symptom usually was headache 30% ( $n = 3$ ), followed by inability to smell or taste 20% ( $n = 2$ ) and fever 20% ( $n = 2$ ), statistically was

not find different ( $p = 0.849$ ) (Table 2B). Overall 58.7% of students stated that the best way to protect themselves from COVID-19 virus is to stay at home, use face mask (19%) or keeping distance of at least 1.5 meters (11%) ( $p < 0.0001$ ) (Figure 2A).

**Table 3:** Ideas about COVID-19, N = 109.

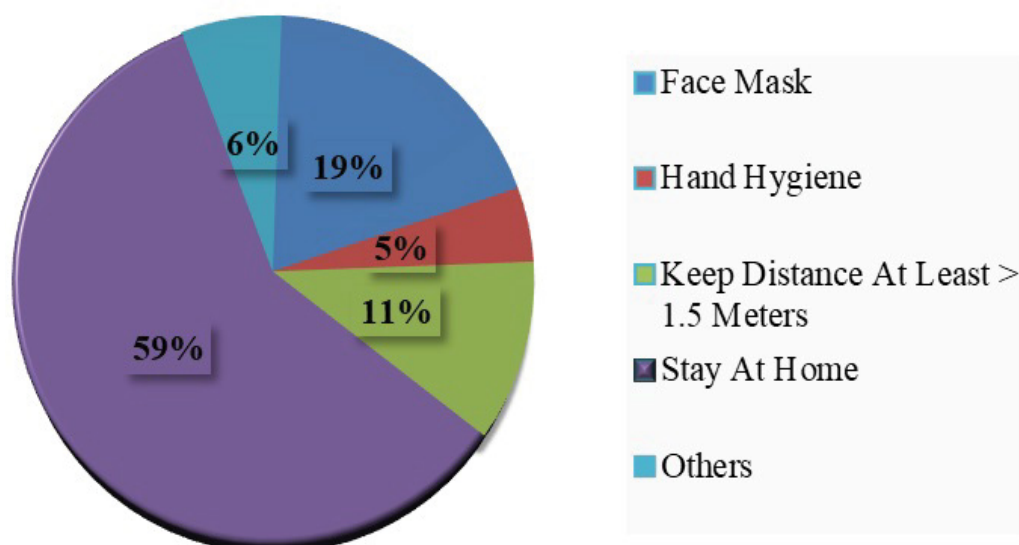
Parameters	Yes, N(%)	No, N(%)	P value
Do you think PCR test is reliable?	82 (75.2%)	27 (24.8%)	< 0.0001
Do you think vaccine will be the solution?	85 (78%)	24 (22%)	< 0.0001
Do you think daily COVID-19 data is reliable?	28 (25.7%)	81 (74.3%)	< 0.0001

### Covid-19 Cases According To Gender



**Figure 1:** COVID-19 infection according to gender. Y-axis indicates 'N' value,  $p = 0.770$ .

### Protection Types



**Figure 2A:** What do you think is the best method of protection? N = 109,  $P < 0.0001$ .

According to results 75.2% of the students think PCR test is reliable and the remaining 24.8% said it is not reliable. 78% of the students think vaccine will be the solution and 74.3% of the students do not trust the daily COVID-19 data ( $p < 0.0001$  for all) (Table 3). According to pre clinic students, the most reliable source on COVID-19 is medical journals 64.2% and followed by social media (16%) and TV-head news (11%), ( $p < 0.0001$ ), (Figure 2B).

The biggest concern about COVID-19 among the students is their family and their own health with (48.6%), followed by the status of their current and future medical education (17.4%) and uncertainty about how long COVID-19 will last (14.7%) ( $p < 0.0001$ ), (Table 4).

### COVID-19: Life influences (basic & educational & social)

Overall 32.1% of all students changed their diet ( $p < 0.0001$ ). 37.1% of the students who changed their diet took vitamin and probiotic supplement, and 34.2% of them increased the vegetable consuming ( $p = 0.001$ ), Figure 3Ai and Figure 3Aii. 74.3% of students do not increase their physical activities ( $p < 0.0001$ ). 57.8%

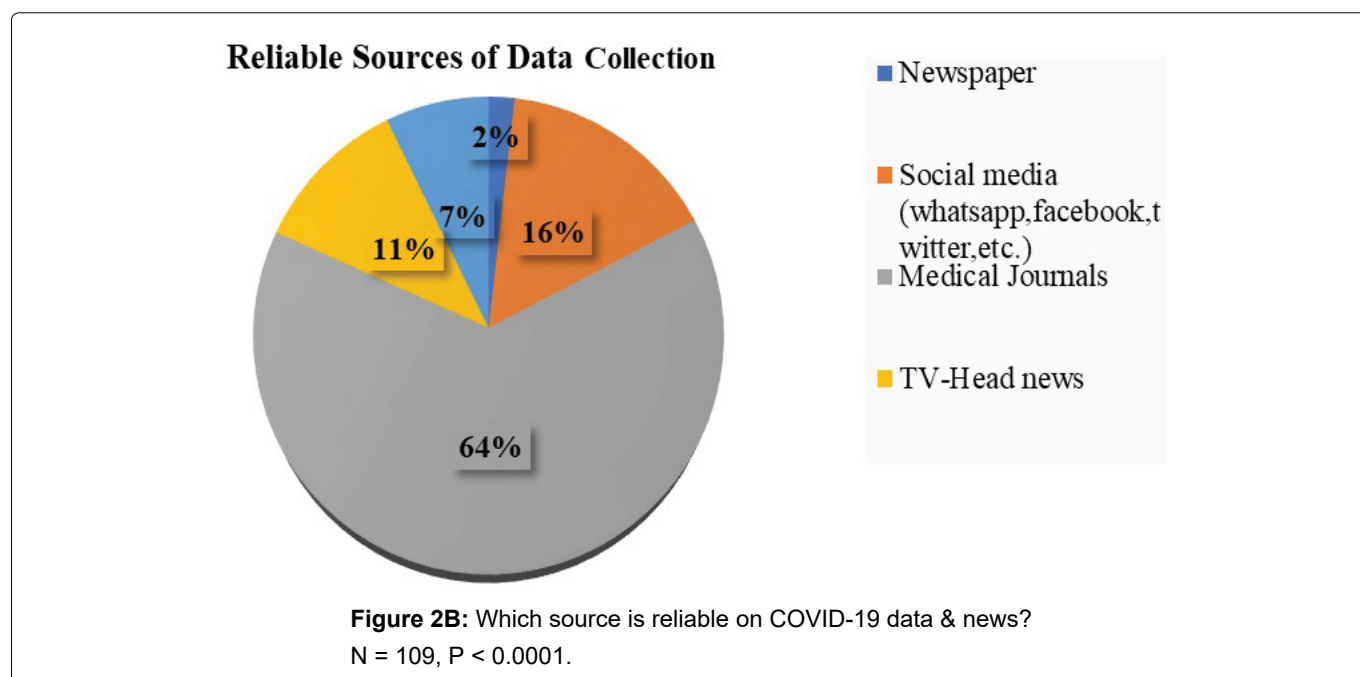
of students responded that their sleeping habits had changed ( $p = 0.103$ ), Figure 3Bi and 77.2% of these students slept more than usual ( $p = 0.001$ ), Figure 3Bii.

Due to COVID-19 68.8% school performance of the students decreased ( $p < 0.0001$ ), Table 5A. Most of them thinks it is because of the low mood due to COVID-19 (60%), followed by the switching to online education (35%), and less socialization (4%), ( $P < 0.0001$ ), Figure 3C. Even though their school performance is decreased our results showed that only 30.3% of them said that their social relation with their friend and their families is bad. 45% of them was the same as usual and 17.4% of them said it is good, ( $p < 0.0001$ ), Table 5B.

COVID-19 affected psychology of the students in many ways. 32.1% of the students faced with worsening mood, 22.9% of them depression and 18.3% of them anxiety, ( $P < 0.0001$ ), Last question in our survey showed that more than half 53.2% said that they do not feel happy during this pandemic and remaining 46.8% said the opposite ( $p = 0.503$ ), Table 5B.

### Discussion and Conclusion

Among EMU preclinical 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> year



**Table 4:** Concerns about COVID-19, N = 109.

Parameters	N, %	P value
<b>What is your the biggest concern about COVID-19?</b>		
• The status of my current and future medical education	19 (17.4%)	<b>&lt; 0.0001</b>
• My family and my own health	<b>53 (48.6%)</b>	
• Not been able to live my youth	4 (3.7%)	
• Economic distress caused by COVID-19 that also affected my family	4 (3.7%)	
• Uncertainty about how long COVID-19 will last	16 (14.7%)	
• Social life cessation	4 (3.7%)	
• Uncertainty in treatment and vaccine	6 (5.5%)	
• Other	3 (2.8%)	

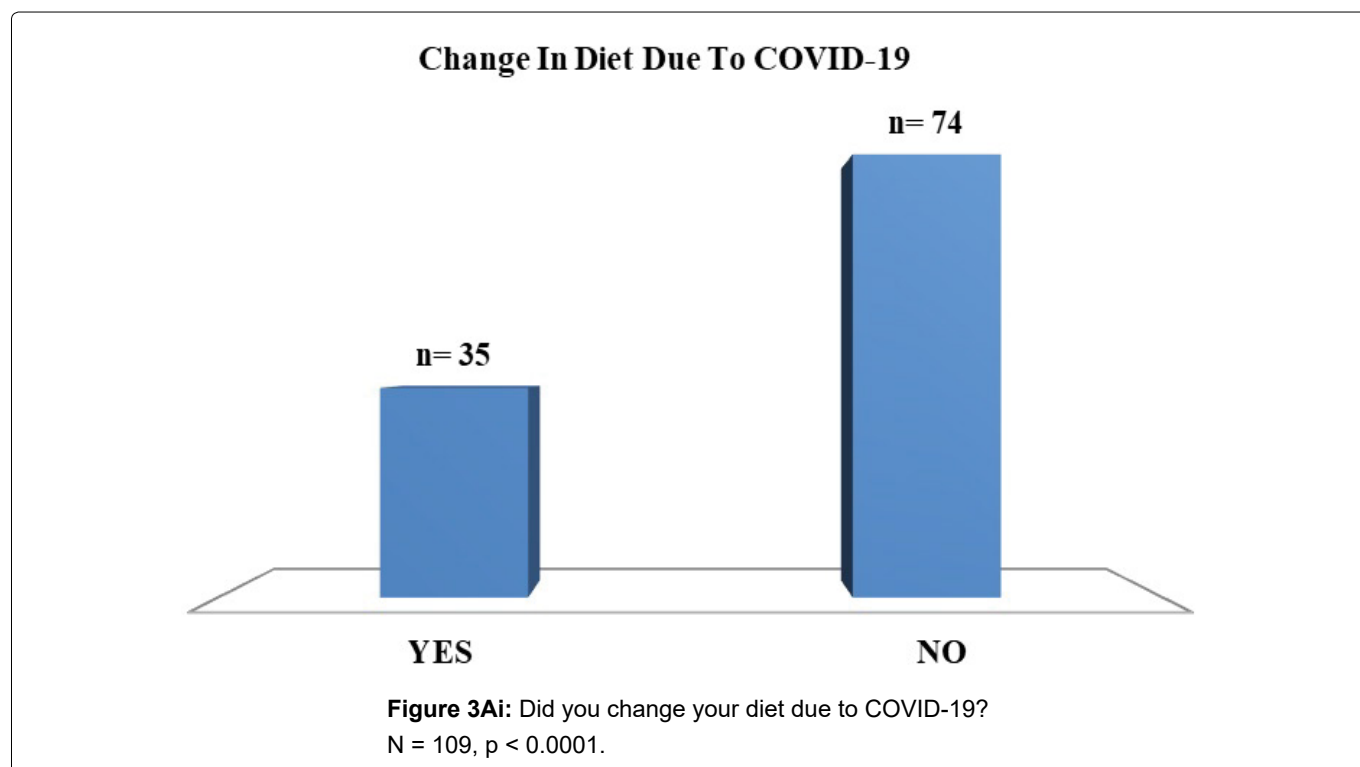


**Table 5A:** Life Influences Basic-Education, N = 109.

Parameters	Yes, N (%)	No, N (%)	P value
Did you change your diet because of COVID-19?	35 (32.1%)	<b>74 (67.9%)</b>	<b>&lt; 0.0001</b>
Did you increase your physical activities to protect yourself from COVID-19?	28 (25.7%)	<b>81 (74.3%)</b>	<b>&lt; 0.0001</b>
Did your sleeping habits change?	<b>66 (60.5%)</b>	43 (39.5%)	0.103
Did your school performance decreased due to COVID-19?	<b>75 (68.8%)</b>	34 (31.2%)	<b>&lt; 0.0001</b>
Finally, do you feel happiness in these days?	51 (46.8%)	<b>58 (53.2%)</b>	0.503

**Table 5B:** Life Influences-Social, N = 109.

Parameters	N, %	P value
<b>How did your social relation with your friends and family during the pandemic?</b>		
• Very good	6 (5.5%)	<b>&lt; 0.0001</b>
• Good	19 (17.4%)	
• Same as usual	<b>49 (45%)</b>	
• Bad	33 (30.3%)	
• Very bad	2 (1.8%)	
<b>How did COVID-19 pandemic affect your psychology? You faced with;</b>		
• Worsening mood	<b>35 (32.1%)</b>	<b>&lt; 0.0001</b>
• Anxiety	20 (18.3%)	
• Depression	25 (22.9%)	
• Nothing	26 (23.9%)	
• Others	3 (2.8%)	

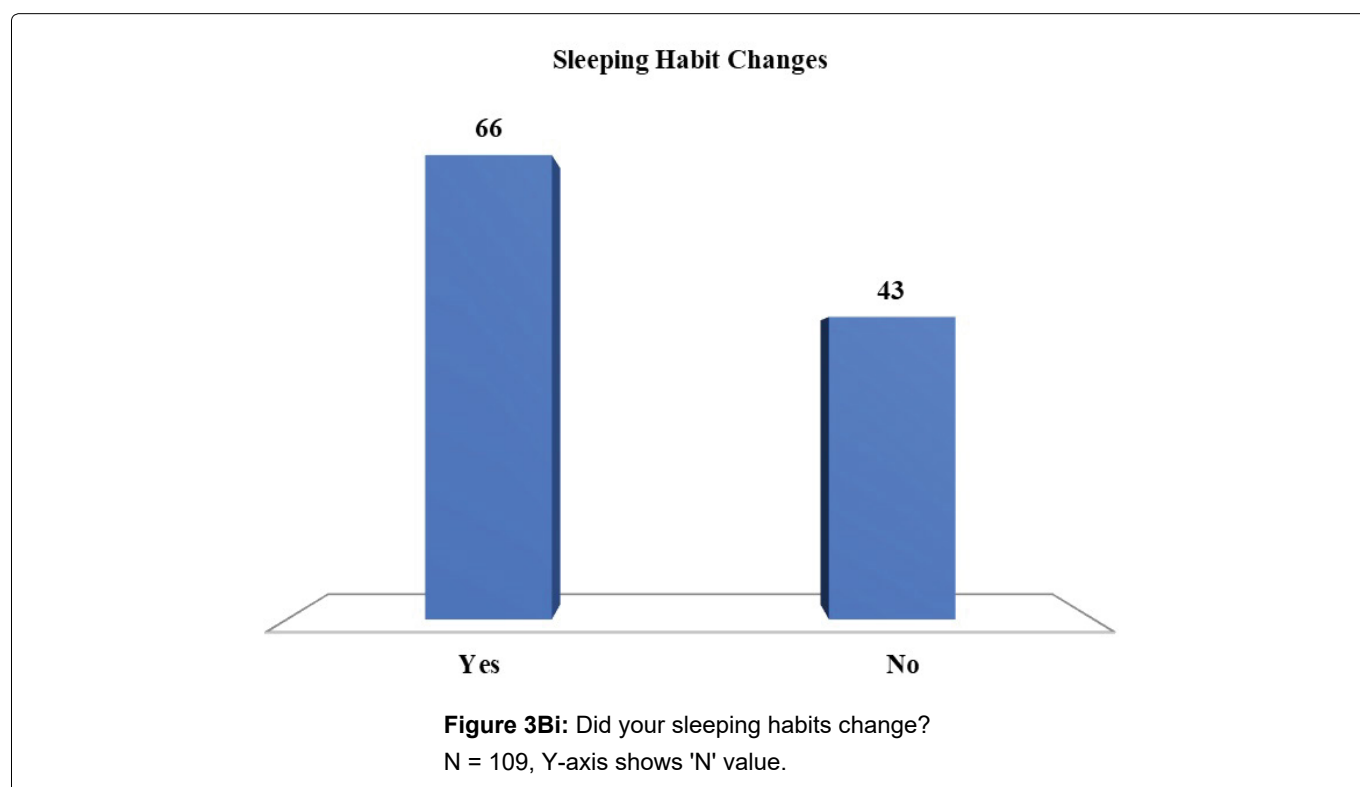
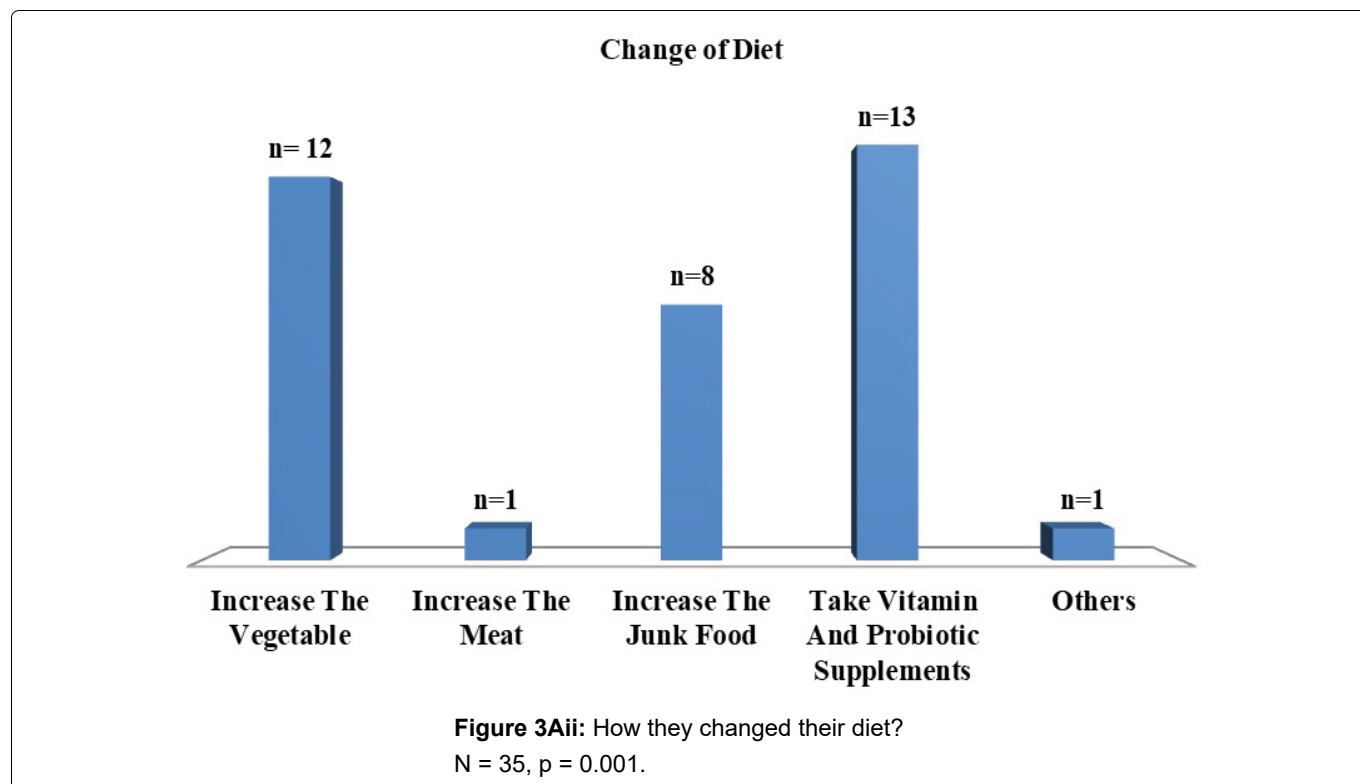


students participating in this study, the number of female participants is higher than the number of male participants. The most second, then first, and at least third year students participated. The majority of the students participating in our research are Turkish and Turkish Cypriots.

In this research, most of the students stated that

they did not get the COVID-19 virus. More than half of the students who had the COVID-19 were second-year students and half of them were Turkish. There was no significant difference between gender and getting the COVID-19 virus.

The total COVID-19 rate in the world is 156 million and 5 million in Turkey (TR) on 8<sup>th</sup> May, 2021 [13]. The

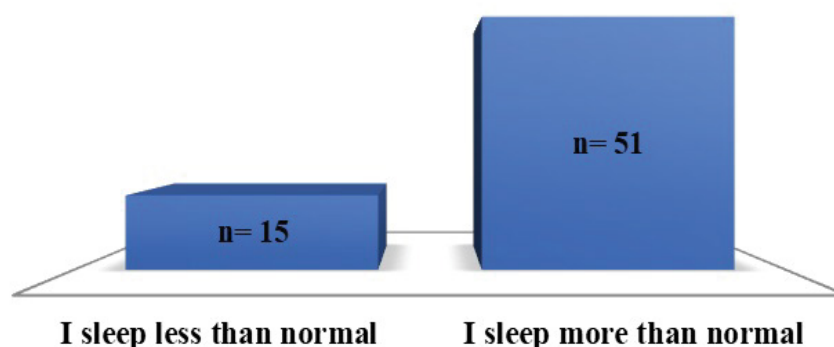


frequency of COVID-19 in TR was around 6%, while our students were 9.2%, that is 3.2% more in research we found stated that the incidence among young adults (18-24 years) was higher than in other age groups during summer and fall, with peaks in mid-July and early September that preceded increases among other age groups (2020) [14]. We did not find a study about the rate of infection with COVID-19 virus in preclinical or medical students.

It was observed that the first symptoms of the

students who got the COVID-19 virus were the most headaches, and then inability to smell-taste and fever, respectively. However, in other research we looked at, it was seen that the main symptoms were cough, fever and difficulty in breathing, respectively among medical students in Uganda [15]. But to make a comment on this issue, larger groups are needed. In our study more than half of the students stated that the best way to protect against COVID-19 is to stay at home. In the references we looked at, regular hand washing, paying more attention to personal hygiene and staying at home were

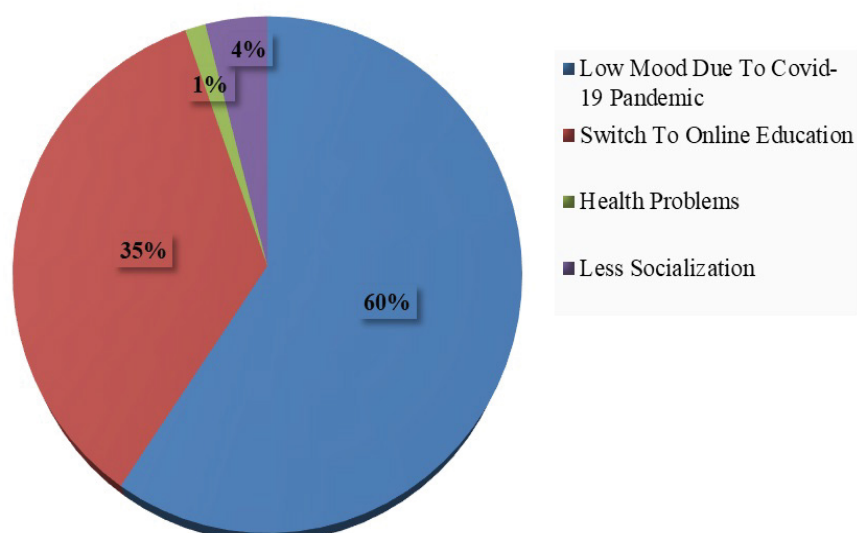
### Change In Sleeping Habits



**Figure 3Bii:** Sleeping habits; how did it change?

N = 66,  $p < 0.0001$ .

### First Leading Cause of Decrease in School Performance



**Figure 3C:** School performance changing; what could be the first leading cause?

N = 74,  $p < 0.0001$ .

the three most common strategies students adopted to protect themselves from becoming infected in Jordan [16].

In this research, more than half of the students stated that while they thought PCR tests were reliable, they did not believe the daily COVID-19 data. According to the resource we looked at meta-analyses have shown that among all methods, the PCR technique using sputum samples is the most sensitive method for the diagnosis of COVID-19 [17]. Students in our research, stated that the most reliable source is medical journals. However, in the references we looked at, most of the students in Turkey stated that the Ministry of Health and the WHO websites are the most reliable sources [18]. Interestingly, TV head-news and newspapers were the least reliable source for COVID-19 data.

Students generally believe that vaccines will be the

solution. In resources we found stated that in multi-step analysis of adults aged 65 and over, receiving an authorized COVID-19 vaccine was associated with significant protection against COVID-19 hospitalization. Efficacy was 94% among fully vaccinated adults and 64% among partially vaccinated adults [19].

It was found that the biggest concern of students about COVID-19 is the health of their families and themselves, as well as uncertainty about future medical education and how long COVID-19 will last, respectively. Similarly in one of the review pointed that especially international student's concerns are about their health, safety, education, as well as their families due to the COVID-19 pandemic [1].

It was observed that during the pandemic, most students did not change their diet, and those who changed their diet received the most vitamins and



probiotic supplements, followed by an increase in vegetable consumption and junk food in our research. Again, in the references we look at, there was no change in their diet of medical students in Croatia. However, approximately 20-38% of students reported that they increased their fruit and vegetable intake during COVID-19 pandemic [20].

In this research, it was found that; three in four students did not increase their physical activity during the pandemic to protect themselves from COVID-19. Similarly, it was found that most of the medical students in Italy reported a decrease in total physical activity due to less walking and movement, impossibility to access sports facilities or lack of gym equipment, and less time for physical activity [21].

It was observed that more than half of our participants had changes in their sleep patterns and most of these people slept more than normal. Again, in the references we look at, it is seen that there is an increase in the sleep patterns of the medical students and adolescents in Croatia during the pandemic [20].

It was determined that almost seventy percentage of the premed students participating in our research had a decrease in school performance and more than half of the reasons for this were low mood due to COVID-19, followed by transition to online education. In one of the met analysis; conducted with overall medical students in America stated that their medical education especially clinical rotations had deteriorated significantly due to the pandemic [22] but in that study personal performance had not been discussed.

COVID-19 psychologically affected our participants. Most of our participants faced with low mood, followed by depression and anxiety. Similarly, nearly half of the medical students in Bangladeshi, have depressive symptoms in varying degrees due to COVID-19 pandemic [23].

However, the overall prevalence of burnout among medical students did not found significantly differ between the pre-COVID-19 period and the COVID-19 period [24-26]. Finally, nearly half of our participants stated that still they feel happiness during the pandemic.

Limited to our project was done online and the participants could not be reached directly due to COVID-19 pandemic. In addition, our sample number is limited due to the same reason. It is recommended to conduct the survey in larger-scale groups.

In conclusion, with respect to the perspectives of preclinical medical students to COVID-19 and effects on their lifestyles, it is observed that most of the students did not find the daily COVID-19 data reliable, but they rely on PCR tests. While a few students were infected with the COVID-19 virus, the majority of them were Turkish students and the biggest concern about COVID-19 among EMU preclinical medical students is their family

and their own health. COVID-19 not much effect their physical life but there is tendency of sleeping more and consuming supplement. Finally, it was observed that most students remained happy during the pandemic, but many students' school performance declined.

## Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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