

Are Science Education Students Sufficiently Aware of “COVID-19”?

Research Article

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ARTICLE INFO	ABSTRACT
<p><i>Article History:</i></p> <p>Received: 24.12.2020</p> <p>Available online: 25.02.2021</p>	<p>This study aims to examine students' level of awareness about COVID-19 by revealing their opinions about the issue. The data of the study was collected in May 2020. To this end, a questionnaire was carried out with 97 students studying in a Science Education program in a faculty of education in the west of Turkey. The data were collected via the internet and to obtain data, a questionnaire with four open-ended questions was designed and used by the researcher. The data were analysed through descriptive analysis. Based on the results obtained, it was revealed that as far as the precautions the students personally take are concerned, the highest frequency values were observed to be in the main category of "Paying attention to hygiene". In addition, it was revealed that COVID-19 had a huge negative effect on life in Turkey and the world, and the greatest adverse effect turned out to be on "Economy". It was found out that after COVID-19, students' lives changed in many different ways. The findings in this study present important and useful information for researchers in terms of students' awareness of the issue and the solutions they come up with. In addition, since the students' opinions are examined from a wide perspective, it is believed that the methodological data analysis will contribute to the related literature and future studies.</p> <p style="text-align: right;">© 2021 IOJES. All rights reserved</p> <p>Keywords: COVID-19, undergraduate students, university, Turkey, education</p>

Introduction

Coronaviruses (CoV) are the largest family of RNA viruses ever identified in terms of gene size (Zhang, Lin, Sun, Curth, Drosten, Sauerhering, ... & Hilgenfeld, 2020). Coronaviruses cause infections ranging from the common cold to the more severe ones like Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS)

The World Health Organization's (WHO) Country Office in China reported on 31 December 2019 cases of a lung inflammation of unknown origin in Wuhan, a city in Hubei province in China (Cakir & Savas, 2020; Zhang et al., 2020). On January 7, 2020, this new coronavirus, which had not been previously detected in humans, was named as COVID-19. On January 30, WHO classified the COVID-19 outbreak as “Public Health

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Emergency of International Concern" and on March 11 declared it as a global epidemic (pandemic) due to the fact that it had then spread over multiple continents. This is also the date when the first case of COVID-19 was confirmed in Turkey.

Various studies have been conducted to investigate participants' level of awareness about the COVID-19 pandemic. Using an online questionnaire, Naser, Dahmash, Alwafi, Alsairafi, Al Rajeh, Alhartani ... & Alyami (2020) conducted a study from 19 March to 6 April 2020 with a total of 1,208 participants from Jordan, Saudi Arabia and Kuwait, in which they aimed to investigate the participants' knowledge and practices concerning COVID-19. They found out that 66.1% of the participants had general knowledge about COVID-19. While 83.0% had good knowledge of disease prevention and control, 43.3% had relatively low knowledge about how the infection is transmitted.

The psychological effects of the COVID-19 pandemic on humans are very important. There are many studies on this subject in the literature. Malhotra (2020) concluded that the pandemic adversely affects even individuals with normal mental health, causing psychological distress, depression, anxiety, aggression and stress, while having devastating effects on individuals with psychological impairment. In addition, this phenomenon, which has not been experienced before in the modern era, is having social, political, economic and educational effects, and there is concern about how countries could satisfy their needs (Rumley, 2020). Researchers, technologists and doctors are working on developing vaccines and drugs to control and treat this infection. As of today, millions of people are reported to have been infected worldwide and hundreds of thousands of people have died due to the infection. By March 23, 2020 there was no drug or vaccine approved for use to treat this virus. Therefore, the only way to stop the spread is social distancing, social isolation and quarantine.

The COVID-19 pandemic has negatively affected the economies of almost all countries in the world. In his report, Fernandes (2020) discusses the economic impact of the COVID-19 crisis on industries and countries, and making historical comparisons with SARS, he argues that the economic effects of the epidemic are currently underestimated, and countries that rely heavily on revenues from tourism, such as Greece, Portugal and Spain, are affected more by this crisis. McKee & Stuckler (2020) note that the restrictions imposed during the COVID-19 pandemic led to the closure of factories and shops, the banning of sports and entertainment activities, and a decrease in the income of individuals and families as a result of the decrease in economic activities.

The COVID-19 outbreak has affected education both in a positive and negative way. While many researchers have achieved positive results, some researchers have reached negative conclusions. In many countries, schools have been closed and education has continued online (Brom, Lukavsky, Greger, Hannemann, Straková & Švaříček, 2020; Rose, 2020), but this has affected more than 60% of the world's student population (UNESCO Institute of Statistics, 2020). A study conducted during the COVID-19 pandemic with 200 students in online classes at a university in India revealed that 74% of the participants enjoyed studying in online courses, but the absence of co-curriculum activities was a common problem for 34% of the participants (Lall & Singh, 2020).

Gonzales et al. (2020) carried out a study with 458 participants in a higher education institution in Spain and found out that COVID-19 lockdown had a significant positive effect on students' performance, as students got better scores in all kinds of exams and increased their efficiency. Basilaia and Kvavadze (2020) state that during the COVID-19 outbreak in Georgia, online education was successful with the use of alternative platforms such as online portals, TV-Online Education, Zoom, Slack, Google Meet and EduPage. In order to reduce the effects of COVID-19 on education, the Chinese government launched what is called "School's Out, But Class's On", an online school education application considered to be the biggest in the world and a pioneering one. As part of this application, rich, diverse, selected and high-quality online teaching resources

were used, and a “student-centred” education model was created to create opportunities for the achievement of online learning (Zhou, Li, Wu & Zhou, 2020; Zhou & Li 2020). Rose (2020) states that following the emergence of COVID-19, medical education has deteriorated, and the curriculum in basic sciences, health systems sciences and even behavioural sciences has been quickly changed into an online format, thus changing the way future doctors are to be educated. In addition, due to the concerns created by the COVID-19 outbreak, many universities around the world have postponed or cancelled their workshops, conferences, sports events and other activities (Sahu, 2020).

The most apparent positive effect of COVID-19 has been on the environment. Introducing changes in the environment is difficult in terms of both the time and effort required. Chakraborty and Maity (2020) say that despite their efforts to restore nature in the first two decades of the 21st century, humans have made little progress, but in the past few months the pandemic has helped preserve the environment and has had positive effects on global climate change.

The Importance and Purpose of the Study

The COVID-19 pandemic is a very important problem the world has faced. The problem greatly affects individuals, society and the environment, and even changes the course of life. Therefore, it is of utmost importance to find out what education faculty students, the prospective teachers of the future, think about COVID-19, what precautions they take personally, what they think of the way the pandemic affects life in Turkey and around the world, and how they express the changes in their lives following the COVID-19 pandemic. Students’ awareness of COVID-19 lays the foundations for the new order of life. Also, the data of the study was collected in May; until that time, there were no studies in the literature examining the views of university students on COVID-19. The results obtained from the study are important in terms of the awareness the students who will become the teachers of the future have and the solutions that they come up with both on a personal and community basis. In addition, the extent to which students become aware of the significance of the personal measures they take is important as they will be responsible for raising social awareness and this will have a widespread influence on education. Also, it is believed that this study, which aims to examine student views from a wider perspective, will contribute to the literature and future studies by revealing how the data is analysed methodologically.

In accordance with the purpose of this study, answers to the following research questions were sought:

1. What are the personal precautions against COVID-19 taken by Science Education students with respect to their grade levels?
2. Considering their grade levels, in the opinion of Science Education students, how has COVID-19 affected life in Turkey?
3. Considering their grade levels, in the opinion of Science Education students, how has COVID-19 affected life in the world?
4. What are the changes in the lives of Science Education students with respect to their grade levels after COVID-19?

Method

Research Model

In order to examine the students' views in depth, to obtain detailed information, and to describe the current situation, the study adopted a screening method, which is a qualitative research approach. A screening study is a research method in which a phenomenon or an issue is thoroughly investigated, and such

characteristics of the participants as interest, skill, ability, and attitude are determined (Büyüköztürk, Çakmak, Akgün, Karadeniz & Demirel, 2010, p.89).

Study Group

In this research, the study group comprises 1st to 4th year students enrolled in a Science Education program in an Education Faculty in the west of Turkey. Table 1 shows the grade level, number and gender of the students, who participated in the study on a voluntary basis. The study group was determined by following the case sampling method, which is one of the easily accessible methods of non-random sampling (Yıldırım & Şimşek, 2006, p.113). The researcher opted for this method for the study because the participants were both quickly and easily accessible and its application was practical.

Table 1. Participants according to grade and gender

Grade	Number of Students	Gender	
		Female	Male
1	34	30	4
2	15	13	2
3	29	24	5
4	19	17	2
Total	97	84	13

Data Collection Tools

In the study, firstly a questionnaire with four open-ended questions was prepared by the researcher in order to identify the opinions of the participants about COVID-19 and their level of awareness about the issue. With these questions, the researcher focused on the precautions the participants take, the effects of the pandemic in Turkey and in the world, and the changes it has caused in their lives.

The researcher formed six questions related to the issue. The questions were reviewed both for the response time and their quality. Next, they were presented to the field experts to take their opinions on those questions. Finally, four questions which reflected students' awareness situation and opinions in a broad perspective were determined at this respect.

The purpose and objectives of the study were explained to the students within the instruction presented at the beginning of the questionnaire. Qualitative data collection method was used in this study. Owing to the current circumstances, the data were collected via the internet. The questionnaire developed by the researcher was sent to each of the participants enrolled via e-mail just like what was done in Giriya's (2020) study. The participants answered this questionnaire on a voluntary basis and sent it back to the researcher's e-mail address.

Data Collection and Analysis

First of all, the answers given by the students to each question of the questionnaire were carefully examined by the researcher. While the data were being assessed, the paper of each student was specified by a letter, and sub-indexed numbers were used to show the student's grade and number. For example, "3rd grade student number 5 was coded as "S3-5". Afterwards, common themes were identified for each question from the answers examined, and answer categories were created. The data obtained from the questionnaire were analysed by performing descriptive analysis. Descriptive analysis aims to describe the characteristics of the individuals participating in a study by using the data obtained through the observation of a sample and with the use of techniques such as frequency and percentage (Büyüköztürk, 2017, p.5). In this study, the researcher re-examined the answer categories specified for each question to ensure the accuracy of the data analysis. In order to make sure the analysis is reliable, the finalized categories were revised in accordance with feedback

from 3 researchers who are experts in their fields. Each expert read the answers of randomly selected 8 students and assessed them with regard to the categories specified. Then, the results of the analysis were compared and it was determined that the percentage of fit was 85.00%. Afterwards, content analysis was made for the data obtained according to the categories created for each question. In addition, in order to reveal student views, literature-supported categories were created for questions 1 and 4 (Lau, Yang, Tsui & Kim 2003). If a student's answer related to more than one category, in the analysis, this answer was included in other categories as well. Therefore, in the tables with frequency and percentage distribution, the total frequency and percentage value of the relevant category is higher than the number of participants. In addition, the descriptive analysis allowed presenting sample statements from the answers of the participants, which helped make the categories easier to understand.

Findings

Student views on personal precautions

In the analysis of the data related to the precautions taken by the participants, as well as the categories created by the researcher, those that were suggested by Lau et al. (2003) were made use of. The data were analysed under 20 sub-categories grouped under three main categories. Table 2 shows the main categories and the sub-categories, and the results of the analysis are presented in frequency (f) and percentage (%).

Table 2. Results related to “personal precautions taken by students” according to grade

Precautions/Grade	1		2		3		4	
	(f)	(%)	(f)	(%)	(f)	(%)	(f)	(%)
Paying attention to hygiene								
Wearing a mask	20	15.7	8	12.1	23	15.4	13	12.0
Wearing gloves	10	7.9	3	4.6	10	6.7	11	10.2
Washing hands	20	15.7	8	12.1	18	12.1	12	11.1
Changing/washing clothes	4	3.1	4	6.1	6	4.0	3	2.8
Using hand sanitizer	15	11.8	6	9.1	12	8.1	8	7.4
Taking a shower	2	1.6	2	3.0	7	4.7	5	4.6
Airing the rooms	2	1.6	2	3.0	2	1.3	3	2.8
Paying attention to house cleaning	2	1.6	2	3.0	5	3.4	3	2.8
Airing clothes/packages/deliveries	5	3.9	3	4.6	5	3.4	2	1.9
Using tissue/flexed elbow when coughing or sneezing	2	1.6	0	0.0	2	1.3	0	.0
Keeping shoes outside	0	0.0	2	3.0	1	0.7	0	.0
Not sharing towels	2	1.6	0	0.0	1	0.7	1	0.9
Sterilizing food	4	3.1	2	3.0	2	1.3	3	2.8
Avoiding contact								
Limiting going out	19	15.0	10	15.2	23	15.4	14	13.0
Avoiding crowded places	8	6.3	5	7.6	15	10.1	10	9.2
Paying attention to social distance	11	8.7	5	7.6	13	8.7	13	12.0
Protecting physical and mental health								
Boosting the immune system	1	0.8	2	3.0	3	2.0	3	2.8
Raising morale and psychology	0	0.0	0	0.0	1	0.7	1	0.9
Taking up a hobby	0	0.0	0	0.0	0	0.0	2	1.9
Doing exercise and sports	0	0.0	2	3.0	0	0.0	1	0.9
Total	127	100	66	100	149	100	108	100

When Table 2 is examined, it is seen that the answers of the students at almost every grade level are in the highest percentage frequency in “wearing a mask”, “washing hands” sub-categories of the main category

of "Paying attention to hygiene". This is followed by the "limiting going out" sub-category of the main category of "avoiding contact". Below are some sample student responses to the sub-categories:

"I wash my hands with soap and water for 20 seconds. If I go out, I wear a mask and gloves." (S1-1), "We frequently air the rooms." (S2-1), "We do a lot of cleaning at home as we are always at home during these times." (S4-14), "When we get a delivery or mail, we do air it outside for 5-6 hours." (S3-21), "I use a disposable tissue when coughing or sneezing. If I don't have one, I cover my mouth with a flexed elbow." (S3-5), "I have kept towels separately for everyone and paid more attention to hand and face hygiene." (S1-33), "When my father goes to the grocery store, we sterilize the food packages and then place them. (S1-28), "I keep social distance when shopping." (S2-1), "I eat a balanced diet to boost my immune system." (S4-2), "During the pandemic, I have taken up some hobbies to keep myself strong." (S4-2), "I am trying to do some small exercises at home." (S2-9).

Students' views on how COVID-19 has affected life in Turkey

The findings obtained from student responses in relation to the ways COVID-19 has affected life in Turkey were evaluated in two parts by providing frequency (f) and percentage (%) values. In the first part, the answers were categorized as "positive" and "negative" (Table 3a), and in the second part they were grouped under 12 categories (Table 3b).

Table 3a. Results for the first part concerning students' views on how COVID-19 has affected life in Turkey according to grade

Grade	Positive		Negative		Total	
	(f)	(%)	(f)	(%)	(f)	(%)
1	6	15.0	34	85.0	40	100
2	5	25.0	15	75.0	20	100
3	4	12.1	29	87.9	33	100
4	3	13.6	19	86.4	22	100

As can be seen from Table 3a, as far as the effects of COVID-19 on life in Turkey are concerned, students from all grade levels expressed negative opinions, while few of them shared positive views. The following are some examples of positive and negative opinions expressed by the students:

"COVID-19 has adversely affected life in Turkey. Social activities have declined. People have been confined to their homes and have become inactive. Intercity travel has been restricted. Life has come to a halt." (S1-1), "The positive side of this pandemic is that nature is renewing itself as people cannot go out onto the streets. The animals are not being harmed." (S1-27).

Table 3b. Results for the second part concerning students' views on how COVID-19 has affected life in Turkey according to grade

Effects/Grade	1		2		3		4	
	(f)	(%)	(f)	(%)	(f)	(%)	(f)	(%)
Social life	19	17.9	9	23.1	19	20.4	12	23.5
Education	20	18.9	5	12.8	21	22.6	8	15.7
Health	9	8.5	2	5.1	3	3.2	2	3.9
Economy	27	25.5	13	33.3	21	22.6	13	25.5
Environment	4	3.8	1	2.6	2	2.2	2	3.9
Transportation	4	3.8	1	2.6	3	3.2	2	3.9
Psychology	10	9.4	2	5.1	10	10.8	7	13.7
Tourism	4	3.8	2	5.1	0	0.0	1	2.0
Agriculture	1	0.9	0	0.0	1	1.1	0	0.0
Sports/Activities	1	0.9	0	0.0	3	3.2	1	2.0

Family communication	2	1.9	1	2.6	3	3.2	2	3.9
Achievements	5	4.7	3	7.7	7	7.5	1	2.0
Total	106	100	39	100	93	100	51	100

When Table 3b is examined, it is observed that the highest percentage frequency values at all grade levels are in the "Economy" category. This category is followed by the "Social life", "Education", "Psychology" and "Achievements" categories. Below are some examples of student responses to each category:

Social life: "The restriction to go out, the closure of social activity areas, and the inability to do activities with friends has had negative effects." (S2-13)

Education: "Distance education has been implemented, but I do not think it is very effective and useful. The reason is that we are accustomed to face to face instruction in the classroom but in online education there is no interaction and it is not very efficient." (S1-19)

Health: "In the time period following the first confirmed case of the infection in our country, I think that our health minister and other authorities have acted selflessly and very carefully and have taken all the necessary steps." (S1-28)

Economy: "In Turkey, COVID-19 led to job losses and disruption of production and thus the economy was badly affected. The pandemic occurred when job opportunities were already so limited in our country, thus creating difficulties for many manufacturers and employers." (S4-7)

Environment: "Air pollution has decreased remarkably in our country." (S1-28)

Transportation: "Airline companies announced that they had stopped all their international and domestic flights. Alternate seating arrangement has been introduced in public transport." (S4-16)

Psychology: "Of course, people are suffering psychologically too. Do I have the virus? I have a sore throat, so am I infected? Such questions have affected people badly." (S1-10)

Tourism: "One of Turkey's biggest source of revenue is tourism and it is at a standstill. The arrival of tourists would be like a miracle under these circumstances." (S1-12)

Agriculture: "Due to the restrictions on the mobility of labour, crops could not be harvested." (S3-27)

Sports/Activities: "Social activities and leisure activities have been stopped in our country and football matches have been postponed till further notice." (S1-20)

Family communication: "Staying at home has improved communication within our family; creating an opportunity for family members to spend more time together and create activities to have fun" (S3-4)

Achievements: "I have acquired new skills, polished up some rusty skills, learned new recipes to try, and mastered house chores." (S3-12)

Students' views on how COVID-19 has affected life in the World

The findings obtained from student responses in relation to the ways COVID-19 has affected life in the world were evaluated in two parts. In the first part, the answers were categorized as "positive" and "negative" (Table 4a), and in the second part they were grouped under 12 categories. The results of the analysis are presented in Table 4a and Table 4b in frequency (f) and percentage (%).

Table 4a. Results for the first part concerning students' views on how COVID-19 has affected life in the world according to grade

Grade	Positive		Negative		Total	
	(f)	(%)	(f)	(%)	(f)	(%)
1	2	5.6	34	94.4	36	100
2	2	11.8	15	88.2	17	100
3	4	12.1	29	87.9	33	100
4	3	13.6	19	86.4	22	100

When Table 4a is examined, it is seen that students at all grade levels expressed negative opinions about the effects of COVID-19 on life in the world, but a small number of students also expressed positive opinions. Below are examples of student responses with negative and positive opinions:

“The situation has gone out of hand in the world. In some countries, the virus is under control. In some others, the cases are increasing every day, and in some, people are left to die.” (S1-15), “I think that animals are at peace now because people are staying away from the animals' habitats. The air and the seas are getting cleaner; the plants are recovering and there is renewal of nature.” (S2-1)

Table 4b. Results for the first part concerning students' views on how COVID-19 has affected life in the world according to grade

Effects/Grade	1		2		3		4	
	(f)	(%)	(f)	(%)	(f)	(%)	(f)	(%)
Social life	16	18.2	3	8.3	9	11.5	8	14.5
Education	10	11.4	4	11.1	9	11.5	1	1.8
Health	8	9.1	7	19.4	18	23.1	11	20.0
Economy	21	23.9	11	30.6	20	25.6	13	23.6
Environment	2	2.3	3	8.3	4	5.1	4	7.3
Transportation	11	12.5	3	8.3	3	3.9	3	5.5
Psychology	6	6.8	1	2.8	4	5.1	5	9.1
Tourism	4	4.5	1	2.8	1	1.3	3	5.5
Sports/Activities	4	4.5	0	0.0	2	2.6	1	1.8
Shortage of Equipment and Facilities	2	2.3	1	2.8	2	2.6	0	0.0
Help/Donation	3	3.4	0	0.0	1	1.3	1	1.8
Country strategies	1	1.1	2	5.6	5	6.4	5	9.1
Total	88	100	36	100	78	100	55	100

As Table 4b shows, in the 1st grade, the highest percentage frequency values are in the category of "Economy" (23.9%) and then in the category of "Social life" (18.2%), while in the 2nd, 3rd and 4th grades, they are in the category of "Economy" (30.6%, 25.6%, 23.6%) followed by "Health" (19.4%, 23.1, 20.0). Below are examples of student responses to each category.

Social Life: “At a time when people can communicate with others and build up relationships easily in the global world, a virus has limited social life and kept people apart.” (S4-1)

Education: “It has caused problems in education in the world. Both those students who have gone abroad for study and those who have been studying in Turkey have been adversely affected in terms of their education. (S1-27)

Health: “The world was caught unprepared for COVID-19. Due to the limited capacity, new hospitals had to be built. Many people could not be treated because the number of beds in hospitals was limited and hospitals reached full capacity. In many countries, the health system collapsed.” (S3-24)

Economy: “The world economy has become very weak. I think the number of countries struggling with the economic crisis is very high.” (S1-21)

Environment: “Although the virus has had negative effects on many aspects of life around the world, it has had a positive effect on air pollution as it has decreased.” (S1-12)

Transportation: “Restrictions have been imposed on transportation activities and international travel has been halted.” (S4-3)

Psychology: “The death of thousands of people in the world and the lockdowns in many countries have negatively affected people’s psychology and created a panic among people.” (S4-3)

Tourism: “People have temporarily shelved their international holiday plans.” (S1-7)

Sports/Activities: “Many festivals and events have been cancelled, especially in European countries.” (S4-17)

Shortage of Equipment/Facilities: “Some countries have difficulty acquiring gloves, masks, disinfectants, and ventilators.” (S3-5)

Help/Donation: “Some countries, particularly Turkey, have helped countries that are in a more difficult situation by sending them medical and cleaning supplies.” (S3-19)

Country Strategies: “The large number of people who die every single day, especially in Italy, wrecks people’s mental health. Strict measures taken in Germany are heralded as a great success, but America, England, and many other countries have pursued wrong strategies and have a high mortality rate, which makes people feel sad.” (S3-4),

Students’ views on the changes in their lives after COVID-19

The findings obtained from student responses in relation to the changes in their lives after COVID-19 were analysed providing frequency (f) and percentage(%) values and grouping them under four main and 20 sub-categories. The main categories and the sub-categories are shown in Table 5.

Table 5. Results related to the changes in the students’ lives after COVID-19” according to grade

Changes/Grade	1		2		3		4	
	(f)	(%)	(f)	(%)	(f)	(%)	(f)	(%)
Acquiring new habits								
Wearing a mask	4	4.5	1	2.9	1	1.2	1	1.4
Wearing gloves	4	4.5	1	2.9	1	1.2	1	1.4
Using hand sanitizer	10	11.4	6	17.1	10	11.6	8	11.3
Paying attention to social distance	13	14.8	6	17.1	6	7.0	7	9.9
Eating healthy food	3	3.4	1	2.9	2	2.3	1	1.4
Valuing								
Freedom	8	9.1	1	2.9	12	13.9	11	15.5
Nature	0	0.0	0	0.0	2	2.3	4	5.7
Time	0	0.0	0	0.0	1	1.2	3	4.2
Health	3	3.4	0	0.0	2	2.3	2	2.8
Family	1	1.1	2	5.7	5	5.8	3	4.2
Social life	16	18.2	11	31.4	15	17.4	14	19.7
Solidarity	2	2.30	0	0.00	1	1.20	1	1.40
Self-development								
Reading	2	2.3	0	0.0	2	2.3	1	1.4
Awareness	4	4.5	0	0.0	3	3.5	1	1.4
Mindfulness	5	5.7	1	2.9	3	3.5	1	1.4

Doing Exercise/Sports	2	2.3	0	0.0	1	1.2	1	1.4
Emergence of a crisis								
Economy	0	0.0	0	0.0	1	1.2	0	0.0
Unemployment	0	0.0	0	0.0	3	3.5	0	0.0
Agriculture	0	0.0	0	0.0	2	2.3	0	0.0
Psychology	11	12.5	4	11.4	13	15.1	11	15.5
Total	88	100	34	100	86	100	71	100

When Table 5 is examined, it is observed that at all grade levels the highest percentage frequency values are in the "Social life" (18.2%, 31.4%, 17.4%, 19.7%) sub-category of the main category of "Acquiring new habits". This sub-category is followed by "Paying attention to social distance" (14.8%) and "Psychology" (%12.5) for the 1st grade students, and by "Attention to social distance" (17.10%) and "Using hand sanitizer" (17.1%) for the 2nd grade students. For the 3rd and 4th grade students, it is the "Psychology" (15.1%, 15.5%) and "Freedom" (13.9%, 15.5%) sub-categories that follow "Social life". For an easier understanding of the categories, some examples of student responses to each category are given below:

"Before COVID-19, I wasn't wearing a mask and gloves, but now I'm." (S1-31); "In the past, physical distance rules were not important, and contact was inevitable. Now I pay more attention to social distancing and avoid unnecessary contact." (S1-12), "I was eating and drinking unhealthily before the outbreak. Now I pay more attention to what I eat to boost immunity." (S1-8); "I have realized the value of freedom during all these days, when we are confined to our houses and cannot go out whenever we want." (S3-27); "I think that post-COVID-19 will be a time in which the world will renew itself and many natural disasters that people may face in the future will be averted." (S4-10); "In my opinion, the biggest change after this outbreak is that everyone understands how precious and valuable health and time are." (S3-4); "We have come to realize how nice it is to spend time with our family members and the elderly." (S3-9); "We cannot go out and meet our friends, so we can say that our social life has been reset." (S1-13); "I would never imagine that people would come together and think about an issue to such a great extent. It is also a source of hope for me to see that the countries are in solidarity." (S3-18); "Taking a positive approach to the lockdown, I have read more books and done more sports." (S1-4); "It showed that one should be a more conscious individual." (S1-16); "I have realized that my life was not as monotonous and boring as I thought, and going to school and especially being able to go out every day was a blessing." (S2-1); "I think there will be a big crisis after COVID-19. Unemployment rates will increase, many factories will close, and there will be a major crisis in agriculture and economy." (S3-22); "Psychologically, this situation has affected me a lot." (S4-8).

Discussion and Conclusion

The awareness of students about COVID-19, which is a new problem for the world, is very important in terms of the precautions that can be taken both on a personal and societal level against potential outbreaks in the future. In some studies, ways of reducing the destructive effects of such pandemics have been identified (De Groot, Baker, Enjuanes, Gorbalenya, Holmes,... & Woo, 2011, p.806., Naser et al., 2020).

An analysis of the student responses related to the personal precautions they take is presented in Table 2 under three main and 20 sub-categories. The analysis revealed that students take a wide variety of precautions at all grades to avoid contracting COVID-19, which is an indication that they have a certain level of awareness about the infection. Conscious individuals make a conscious society. In this respect, it is thought that being students of Education Faculty and having a role to make the society conscious, the participants will have a great impact when they are themselves conscious. An examination of Table 2 shows that the responses of students at each grade level have the highest percentage frequency values in the "Wearing a mask" and "Washing hands" sub-categories of the "Paying attention to hygiene" main category, and it is followed by the

"Limiting going out" sub-category of the main category of "Avoiding contact". A review of the literature reveals that these results are in line with the findings of the majority of studies (Turkish Ministry of Health, 2020; Naser et al., 2020). When the literature on the "boosting the immune system" sub-category of the main category of "Protecting physical and mental health" was reviewed, studies similar to this study were found (Majumder, Biswas & Majumder, 2020; Naser et al., 2020). In their study, Cakir and Savas (2020) note that it is necessary to boost the immune system and for this to be achieved it is important to eat natural and healthy food.

Students' opinions about the effects of COVID-19 on life in Turkey were categorised as "positive" and "negative" and were analysed under 12 categories, as shown in Table 3a and Table 3b. When Table 3a is examined, it is seen that the students at all grades expressed negative opinions, but a small number of students at each grade level also shared positive views. Students with negative opinions say, for example, that in Turkey "economic difficulties have arisen due to the closure of workplaces", and that "people's mental health has been adversely affected". On the other hand, those with positive views state, for example, that "people are acquiring new skills", and that "the level of environmental pollution is decreasing". Similar results were reported in the literature (Cheng, 2020; McKee & Stuckler, 2020; Zhou, Li, 2020). When Table 3b is examined, it is observed that the highest percentage frequency values at all grade levels are in the "Economy" category. This category is followed by the categories of "Social life", "Education", "Psychology" and "Achievements". That most student answers fall in the category of "Economy" results from the fact that students think the biggest effects of COVID-19 in Turkey have been on the economy. In their responses, students often expressed the idea that in Turkey "unemployment has increased", and "people have financial difficulties". In the literature, there are studies with similar results which state that COVID-19 has negative effects on economy (Fernandes, 2020; McKee & Stuckler, 2020), and which highlight the negative effects of restrictions on social life (Cakir & Savas, 2020; Malhotra, 2020). While most of the studies in the literature investigating the effects of COVID-19 on education report positive views (Basilaia & Kvavadze, 2020; Brom et al., 2020; Lall & Singh, 2020), a small number of studies report negative opinions (Sahu, 2020; Rose, 2020). In this study, the students stated that COVID-19 negatively affected their education. In this respect, the results of this study are similar to those of other studies in the literature. In addition, there are studies in the literature investigating the psychological effects. In her study, Rumbley (2020) states that this epidemic, which is unprecedented in the modern age, has caused psychological effects such as anxiety, uncertainty, restlessness, and fear. In a similar study, Sahu (2020) states that many events around the world have been postponed and the reason for this is the anxiety due to COVID-19. In this study, it is obtained that the results are similar to do literature. However, there is no study encountered that examining the achievements during this pandemic in the literature. Therefore, it is thought that this study will contribute to the literature and to the studies to be conducted in the future.

Student responses related to the effects of COVID-19 on life in the world were analysed under categories similar to those formed for the analysis of the effects of the pandemic on life in Turkey. Just like the responses to the second research question, the answers to this research question were categorized as "positive" and "negative" (Table 4a) and were grouped under 12 categories (Table 4b). An examination of Table 4a shows that all grade levels the students expressed negative opinions, but a small number of them also shared positive ideas. Those with negative opinions often expressed "shortages of medical equipment and staff, and limited hospital capacities", and "the deterioration of national economies". On the other hand, students who expressed positive opinions referred to "reduced environmental pollution" and "the renewal of nature" both in Turkey and the rest of the world. There are studies with similar results in the literature. (Cheng, 2020; McKee & Stuckler, 2020; Rumbley, 2020). When Table 4b is examined, it is observed that the highest percentage frequency values at each grade level are in the category of "Economy", followed by "Social life" and "Health" categories. In the literature, there are studies that examine the effects on world economies (Fernandes, 2020; McKibbin & Fernando, 2020), the restrictions on social life (Malhotra, 2020), and the effects on the health sector

(Naser et al., 2020, Sohrabi, 2020). In addition, the fact that countries pursue different strategies leads to differences in the spread and control of this pandemic. In this study, “the high death toll in Italy” and “the poor strategies adopted in the USA and the UK” can be given as examples of student responses regarding “Country strategies”. Similar results appear in the literature. Demir, Günaydın and Demir (2020) stated in a study that careless statements and practices in the USA and England resulted in an increase in the number of cases and deaths. Also, Shaw, Kim & Hua (2020) determined that the risk of the outbreak spreading in East Asian countries of China, Japan and South Korea was decreased due to effective medical services and the widespread use of developing technologies. Lee, Chiew and Khong (2020) stated that in Singapore, the strategies developed by the government to educate people and raise public awareness proved effective in reducing the number of cases and deaths. No study has been found in the review of the related literature on the categories of “Shortages of equipment and facilities” and “Help and donation”. In this respect, it is believed that the results of this study will contribute to the literature and future studies.

Findings obtained in relation to the changes in the students’ lives after COVID-19 (Table 5) were analysed under four main categories and twenty sub-categories. In this study, student answers were analysed from a very wide perspective, which indicates that the students’ lives were different before and after the pandemic. With this fact in mind, an examination of Table 5 shows that at all grade levels student responses have the highest percentage frequency values in the “Social life” sub-category of the main category of “Acquiring new habits”. The reason for this is that the students perceive the limitation of their social lives as the biggest change in their lives. This sub-category is followed by the sub-categories of “Paying attention to social distance”, “Psychology”, “Using hand sanitizer” and “Freedom”. The reason why the highest percentage frequency values for each grade are in different sub-categories may be due to the fact that students had different perceptions of and attitudes towards this problem since their lives were different from each other before and after the pandemic.

The results obtained in this study provide important and useful information for the researchers as they reveal the students’ level of awareness about the issue and the solutions that they come up with on a personal basis. In addition, since this study examines student views from a broader perspective, it is believed that the methodology pursued in the analysis of data will contribute to the literature and the studies to be carried out in the future.

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