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Impacts of social distancing during COVID-19 pandemic on the daily life of forestry students

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A B S T R A C T

University life has changed profoundly due to social distancing measures to control the spread of COVID-19. Over the longer term, the coronavirus crisis may affect the mental health of undergraduate students who are required to cope with remote options and forgo the usual campus life. The aim of this study is thus to investigate the impacts of COVID-19 on undergraduate students’ mental health and daily life in order to assist policymakers improve pandemic control plans and help educators and healthcare experts provide support to affected undergraduates. Results are based on quantitative data collected via online questionnaires which were completed by 181 Greek undergraduate forestry students. The analysis indicated that the students were highly affected by the closure of universities and the transition to distance learning. Moreover, they experienced negative emotions, mostly concern and anger, during the lockdown. T-test showed that female respondents experienced strong negative emotions like fear, panic and despair to a higher degree than male students who were more optimistic about the pandemic. Surprisingly, the students did not exercise outdoors every day even though it was allowed during the 42-day quarantine. In addition, they used mostly television and scientific articles to obtain information about COVID-19. The results presented in this study offer insights into university students’ experience with the pandemic and reveal their reaction to remote education. It is recommended to monitor university students’ mental health frequently and to provide them with psychological counselling and practical advice on how to manage anxiety and fear. Finally, education and training on remote learning could help reduce students’ anxiety over online classes and exams.

1. Introduction

In December 2019, an alarming number of pneumonia cases emerged in Wuhan city in the Province of Hubei in China forcing the Chinese government to declare a state of emergency. It was soon identified that these cases were caused by the new coronavirus named Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which became commonly known as COVID-19 (Tan et al., 2020). The most severe cases can develop pneumonia, acute respiratory syndrome and kidney failure (Ren et al., 2020). What makes COVID-19 particularly dangerous is that the limited available therapeutic options and the severity of symptoms can lead to patients’ death. Moreover, people infected with COVID-19 may not be showing any signs of infection but transmit it to others (WHO, 2020). According to the World Health Organization (WHO), asymptomatic patients could be causing even half of the spread (WHO, 2020) and, since the outbreak in December 2019, the virus has spread in nearly every country in the world while, in March 2020, WHO declared COVID-19 a global pandemic.

In spring 2020, many countries decided to implement drastic measures to contain the first outbreak of the pandemic. As this disease can be transmitted both from symptomatic and asymptomatic cases, the most widely adopted strategy to halt the spread has been to decrease social interactions as much as possible. Authorities around the globe ordered nation-wide lockdowns often referred to as “quarantines”, which impose the separation and restriction of citizens to ensure that, if they become ill or carry the virus, they will not transmit it to others. In addition, schools, universities, churches, recreational spaces, retail stores and every place, where people could gather, had to close until further notice.

While the treatment and transmission of COVID-19 has attracted major research interest, the psychosocial impacts of the pandemic should not be overlooked as there is already evidence showing that the pandemic and the imposition of strict measures can compromise the mental health of individuals. In specific, Loades et al. (2020) conducted a systematic review and observed that social isolation and loneliness...
during lockdowns can escalate the risk of developing depression and anxiety disorders. On top of that, quarantined individuals experience negative emotions like stress, irritability, fear, frustration, boredom, confusion, anger but can also develop post-traumatic stress disorder (PTSD) and insomnia (Brooks et al., 2020; Hosain et al., 2020). Such adverse psychological outcomes are exacerbated by certain factors with the most important being the fear of infection, long periods of lockdown, difficulty accessing medical care and medications, lack of necessary supplies and stigma (Loades et al., 2020; Hawryluck et al., 2004; Reynolds et al., 2008; Marjanovic et al., 2007). Another factor which has been linked to poor mental health during COVID-19 pandemic is professional and financial uncertainty due to the suspension of professional activities with no prior planning (Brooks et al., 2020; Loades et al., 2020). Moreover, previous studies have shown that insufficient information from public health authorities about the quarantine and its purpose can act as stressors for quarantined individuals (Braunack-Mayer et al., 2013). Younger individuals including children, adolescents and university students also experience stress during quarantines as they are required to go through prolonged periods of physical isolation from their classmates, friends, teachers and extended family (Loades et al., 2020). However, younger people are more vulnerable to mental health problems due to social distancing measures in comparison to adults (Deighton et al., 2019) and there are already reports of adolescents experiencing loneliness during COVID-19 lockdowns (Loades et al., 2020) with the link between loneliness and poor mental health being well-established (Wang et al., 2017). As far as university students are concerned, Cao et al. (2020) discovered a positive and moderate correlation between pronounced anxiety levels and students’ concerns about academic delays and the impact of COVID-19 on their academic performance. With isolation threatening mental health, the pandemic has demonstrated the key role of the Internet in home confinement. Indicatively, Papouli et al. (2020) found that the overwhelming majority (by 98.55%) of Greek social work students spent greater periods of time online in order to connect with their friends and loved ones, but also to reconnect with old friends, classmates and people residing abroad or in Greek other cities. Moreover, a significant share of students (by 47.82%) used web technologies as recreation means to read e-books, watch movies and listen to music. These online activities helped them broaden their knowledge and deal with the unprecedented situation that humanity was going through due to the pandemic.

As the new virus started to spread around the globe, Greek authorities had strong reasons to be concerned about a possible uncontrollable outbreak of COVID-19. On the one hand, the ten-year economic crisis left the national healthcare system diminished to the degree that intensive care could be provided to a specific number of patients. On the other hand, Greece has a high percentage of elderly people in its population and older individuals are at greater risk for severe illness from COVID-19 (United Nations, 2019). From this perspective, Greece was considered most vulnerable to the risk of an uncontrollable virus outbreak during the first pandemic wave which would wreak havoc on its already ailing healthcare system.

Knowing that the odds were against them, the Greek authorities enforced stringent social distancing measures very early. On February 27, only a day after the first COVID-19 case was confirmed, the government announced the official cancellation of all carnival celebrations and, on March 11, the government banned the operation of schools since the closure of educational institutions has been shown to be a highly effective measure to stop the spread (Jackson et al., 2014). Shortly after, the country restricted nonessential travelling and closed cafes, restaurants, retail stores, libraries, museums, cinemas and parks among other places. In addition, the circulation of citizens was restricted, and, during the 42 days of lockdown, citizens were allowed to leave their house only in order to go to their work, shop for groceries or pharmaceuticals, visit a doctor, take brief exercise outdoors and walk their pet. In order to perform these necessary activities, citizens had to obtain a ‘circulation permission’ (Fouda et al., 2020; Papouli et al., 2020). That is, they had to complete a form or send a text message to ‘13033’ stating one of the allowed reasons to leave the house and were required to carry their identity card or passport with them. The violation of the circulation rules would risk a fine of 150 euros. The strict measures to halt the spread of coronavirus in Greece during the first pandemic wave were very effective. In specific, the rate of confirmed cases fell to less than ten per day towards the end of the lockdown.

Against this background, Greek university students had to adjust to a new and different life from the one they were used to. Under normal circumstances, university life involves considerable social interaction. Thousands of students move from one region to another to go to university and, there, they can pursue their studies while enjoying new activities in the company of their classmates with whom they build bonds, possibly for life. Undergraduates participate in many social activities, such as meeting friends for coffee, going out for lunch and going for walks, but also take part in activities which “cultivate the mind” such as attending theatres, cinemas, music concerts and cultural events. In addition, many students enroll in sport activities offered by their universities making good use of their free time and enjoying a better quality of life.

However, in Greece university life stopped in March 2020 as students had to return to their hometowns without knowing when the university would open again and, at the same time, they had to adjust to online learning without any prior training or preparation. With universities having closed and their usual daily life having been disrupted, undergraduates were required to continue their studies at university which was now experiencing a digital transformation. The problem that arises is that it remains unknown how the extended lockdown and the requirement to attend courses and exams online has affected the mental health and daily life of undergraduate students. Hence, the aim of the present study is to investigate whether the imposition of measures protecting physical health has affected the mental health of undergraduate students majoring in the Department of Forestry and Management of the Environment and Natural Resources, in Greece. This is an area that requires special attention for two reasons. First, if a discernible impact is detected, mental healthcare should be provided to students in order to restore their wellbeing so that they can advance in their studies. Second, insights into the impact of nation-wide quarantines may have important lessons for policymakers who are involved and engaged in the design of pandemic control plans. That is, knowledge about students’ experience with the pandemic can point to the measures that need to be improved and the areas that need to be addressed in order to ensure that the imposition of measures during pandemics does not compromise their mental health.

2. Materials and methods

The results presented in this paper are part of a wider research examining the views on the effects of environmental degradation on infectious disease emergence among undergraduate students at the Faculty of Agricultural and Forestry Sciences of the Democritus University of Thrace which is located in Orestiada in Northern Greece. The Faculty encompasses two departments: The Department of Forestry and Management of the Environment and Natural Resources as well as the
Department of Agricultural Development. In accordance with the existing legislation, every research carried out within the university must first be approved by the Research Ethics Committee. Hence, the Research Ethics Committee of the Democritus University of Thrace examined and approved the content of the questionnaire and the methodology to perform the study (Decision 50694/405, 01–06–2020 Decision of the 9th/29–05-2020 board meeting of the Research Ethics Committee).

The questionnaire, which was the main research instrument, consisted of 16 closed-ended items. The closed-ended type was considered appropriate because it requires from respondents little effort and time. As for the content of the questionnaire, it included five sections. The first section gathered information on respondents’ sociodemographic characteristics and the second examined their views on environmental topics. The third section collected information about respondents’ environmental attitudes and the fourth section examined their views on various topics related to COVID-19 while the fifth section investigated what sources they use to obtain information on COVID-19.

An introductory note on the top of the first page of the questionnaire provided respondents with important information. In the note, it was stated that the survey was conducted by the Democritus University of Thrace and, in specific, by the Department of Forestry and Management of the Environment and Natural Resources. The note also included information about the aim of the study as well as the name and contact number of the professor who is responsible for the study. It concluded by guaranteeing anonymity and confidentiality to the participants and stating that participation is voluntary.

The sampling method was the multistage sampling. The year of study served as the first stage and courses as the second stage. Hence, the students attending each course were recorded and for each year of study two courses were drawn. Namely, students attending two courses in each year of study would participate in the study.

The collection of the questionnaires would be conducted in two ways. According to the first, the questionnaires would be completed during classroom time as long as the professor of each course would consent. The students who would agree to participate would be informed orally that their participation is entirely voluntary and that they have the option not to participate. The anonymity of the respondents would be ensured as the respondents would insert the completed questionnaire into a sealed envelope and then place it into a secured box. According to the second way of questionnaire collection, the survey would be administered to students using the online survey portal, Google forms®. The online link to the survey would be available on the university’s online learning platform (https://e-class.duth.gr) and the respondents would be able to read the information about the survey and participation in the Title and Description boxes before the first section of the questions. At the bottom of this note there would be the question “Do you agree to participate in the survey?” and, if they wished to participate, they would proceed with the completion of the questionnaire and otherwise they would leave the page.

In alignment with the measures to control the spread of COVID-19, the Rector and vice Rectors of the Democritus University of Thrace decided to suspend in-person teaching and to conduct all classes online. Hence, the researchers decided to carry out the present study using the online survey portal, Google forms® and not to contact the survey in-person. For the Department of Forestry and Management of the Environment and Natural Resources the study started on 1 June 2020 and ended on 5 July 2020. In order to ensure the protection of respondents’ personal information, the database was stored on a computer which has no access to the Internet and is located in the Laboratory of Forest and Environmental Policy, Education and Communication.

In total, 183 on-line questionnaires were submitted but two of them were incomplete as these students did not consent to proceed with the completion of the questionnaire. The total number of usable completed questionnaires was 181. The number of completed questionnaires along with respondents’ distribution of respondents by their year of study were considered satisfactory. To be more precise, the sample size in this study is almost the same as the sample size in similar in-person surveys conducted with students of the department in the last years (Papatha- naki, 2018; Karasmanaki and Tsantopoulos, 2019; Pappa, 2020). According to the Quality Assurance Unit, which is the advisory body for the administration of the Democritus University of Thrace, at the time of the study, 457 students were enrolled in the department and were attending one of the five years of study, which is the regular duration of study, and another 352 students were enrolled in the department but exceeded the regular five years. In other words, the overall number of enrolled students was 809 and in this study 183 students participated, which corresponds to 22.6% of total enrolled students. This figure shows a satisfactory analogy between population and sample.

To analyze the collected data, descriptive statistics, Cronbach’s alpha, the non-parametric Friedman test, Factor analysis and Independent Samples Test were performed. Cronbach alpha is performed to examine the internal reliability of the questionnaire; that is, it determines whether the data have the tendency to measure the same event and expresses the correlation square between the scoring (observed) assigned to a certain individual in the scale and the scoring it would have been assigned (actual) if the individual was asked about all topics (Siardos, 1998). In our analysis, the non-parametric Friedman test was also used. The non-parametric Friedman test compares the values of three or more correlated groups of variables. The distribution of the Friedman test is χ2 distribution with degrees of freedom (df) df = k - 1, where k is the number of teams or samples. This test classifies the values of variables for every subject separately and calculates the mean rank of classification values for each variable (Freund and Wilson, 2003, Ho, 2006). Factor analysis is a statistical method that aims to examine the existence of common factors within a group of variables (Sharma, 1996). More specifically, principal component analysis was used here, which is based on the spectral analysis of the variance (correlation) matrix (Siardos, 1999; Jolliffe, 2002). The criterion used for the significance of the principal components was the one recommended by Guttmann and Kaiser (Cattell, 1978).

### Table 1

| Variable | Category | Frequency | Percentage |
|----------|----------|-----------|------------|
| Students’ gender | Male | 71 | 39.2 |
| | Female | 110 | 60.8 |
| Year of study | 1 | 35 | 19.3 |
| | 2 | 24 | 13.3 |
| | 3 | 31 | 17.1 |
| | 4 | 29 | 16.0 |
| | 5 | 27 | 14.9 |
| Father’s occupation | Employed in the public sector | 44 | 24.3 |
| | Employed in the private sector | 31 | 17.1 |
| | Farmer | 44 | 24.3 |
| | Unemployed | 9 | 5.0 |
| | Pensioner | 33 | 18.2 |
| Mother’s occupation | Employed in the public sector | 53 | 29.3 |
| | Employed in the private sector | 36 | 19.9 |
| | Freelancer | 15 | 8.3 |
| | Householder | 40 | 22.1 |
| | Farmer | 11 | 6.1 |
| | Unemployed | 12 | 6.6 |
| | Pensioner | 14 | 7.7 |
| Educational level of father | Compulsory education | 46 | 25.4 |
| | Secondary education | 72 | 39.8 |
| | Higher education | 63 | 34.8 |
| Educational level of mother | Compulsory education | 25 | 13.8 |
| | Secondary education | 75 | 41.4 |
| | Higher education | 81 | 44.8 |
60.8% were female and, consequently, female students outnumbered the male ones. Additionally, respondents' year of study presents some differentiation ranging from 14% to 19%. Information on students' family background including parents' occupation and education level was also gathered. As Table 1 shows, substantial shares of students' fathers were employed in the public sector (24.3%) and were freelancers (24.3%). Remarkably, only 2% of the fathers were unemployed. As for students' mothers, considerable shares were employed in the public and private sector (29.3% and 19.9%, respectively), whereas an appreciable share did not work and was involved with the household duties (22.1%). Finally, significant shares of fathers (by 34.8%) and mothers (by 44.8%) were university graduates.

3. Results

3.1. Demographic characteristics of respondents

The demographic characteristics of respondents are presented in this section. According to Table 1, 39.2% of respondents were male and 60.8% were female and, consequently, female students outnumbered the male ones. Additionally, respondents' year of study presents some differentiation ranging from 14% to 19%. Information on students' family background including parents' occupation and education level was also gathered. As Table 1 shows, substantial shares of students' fathers were employed in the public sector (24.3%) and were freelancers (24.3%). Remarkably, only 2% of the fathers were unemployed. As for students' mothers, considerable shares were employed in the public and private sector (29.3% and 19.9%, respectively), whereas an appreciable share did not work and was involved with the household duties (22.1%). Finally, significant shares of fathers (by 34.8%) and mothers (by 44.8%) were university graduates.

### Table 2
Frequency and percentages regarding the occurrence of coronavirus case in students' family.

|        | Frequency | Percentage (%) |
|--------|-----------|----------------|
| Yes    | 3         | 1.7            |
| No     | 178       | 98.3           |
| Total  | 181       | 100.0          |

### Table 3
Frequency and percentages regarding students' responses on whether a member of their family belonged to high-risk groups.

|        | Frequency | Percentage (%) |
|--------|-----------|----------------|
| Yes    | 134       | 74.0           |
| No     | 47        | 26.0           |
| Total  | 181       | 100.0          |

### Table 4
The application of the Friedman test for ranking respondents' feelings about the pandemic.

| Variables | Mean rank |
|-----------|-----------|
| Fear      | 5.48      |
| Optimism  | 4.35      |
| Anxiety   | 5.79      |
| Anger     | 6.33      |
| Indifference | 4.09   |
| Concern   | 7.08      |
| Loneliness| 4.79      |
| Panic     | 3.54      |
| Despair   | 3.54      |

N = 181, Chi-Square = 369.051, df = 8p < 0.001

according to which, the limit for obtaining the required number of principal components is defined by the eigenvalues which are equal to or greater than one. We concluded with a matrix rotation of the principal components using Kaiser’s varimax rotation method (Harman, 1976) for better results.

3.2. The pandemic in students' family

Students were asked if any member of their family had been infected with COVID-19 and whether any family member belonged to high risk groups. As it can be seen in Table 2, only 1.7% of students reported that a member of their family had contracted COVID-19 but the majority (by 74%) indicated that at least one member of their family belonged to a high risk group (Table 3).

### Table 5
The rotated factor loadings for students' emotions about the pandemic.

| Component | 1         | 2         | 3         |
|-----------|-----------|-----------|-----------|
| Panic     | 0.884     | –0.057    | 0.042     |
| Fear      | 0.807     | –0.279    | –0.155    |
| Despair   | 0.792     | 0.215     | –0.012    |
| Anxiety   | 0.727     | –0.107    | –0.359    |
| Loneliness| 0.675     | 0.168     | 0.016     |
| Anger     | 0.133     | 0.873     | –0.110    |
| Indifference | –0.254   | 0.511     | 0.417     |
| Optimism  | 0.091     | 0.024     | 0.829     |
| Concern   | 0.431     | 0.310     | –0.473    |

### Table 6
T-test results comparing students' gender and their emotions about the pandemic (m. v.: mean value, s. d.: standard deviation, t: t-test, df: degrees of freedom).

| Emotions | Gender | n  | m. v. | s.d. | t   | df | p     |
|----------|--------|----|-------|------|-----|-----|-------|
| Fear     | Male   | 71 | 2.521 | 1.2172 | –2.507 | 179 | 0.013 |
|          | Female | 110| 2.973 | 1.1610 |       |     |       |
| Optimism | Male   | 71 | 2.563 | 1.3281 | 1.878  | 179 | 0.042 |
|          | Female | 110| 2.200 | 1.2326 |       |     |       |
| Anxiety  | Male   | 71 | 2.479 | 1.2172 | –2.158 | 179 | 0.030 |
|          | Female | 110| 3.273 | 1.2772 |       |     |       |
| Anger    | Male   | 71 | 3.225 | 1.3856 | 1.366  | 179 | 0.174 |
|          | Female | 110| 3.491 | 1.2020 |       |     |       |
| Indifference | Male    | 71 | 2.296 | 1.4081 | 0.251  | 179 | 0.802 |
|          | Female | 110| 2.245 | 1.2575 |       |     |       |
| Concern  | Male   | 71 | 3.507 | 1.1448 | –1.914 | 179 | 0.057 |
|          | Female | 110| 3.818 | 1.0153 |       |     |       |
| Loneliness | Male    | 71 | 2.423 | 1.3223 | –0.959 | 179 | 0.339 |
|          | Female | 110| 2.618 | 1.3477 |       |     |       |
| Panic    | Male   | 71 | 1.718 | 1.1236 | –2.365 | 179 | 0.019 |
|          | Female | 110| 2.136 | 1.1846 |       |     |       |
| Despair  | Male   | 71 | 1.662 | 1.0947 | –2.948 | 179 | 0.004 |
|          | Female | 110| 2.182 | 1.1977 |       |     |       |

3.3. Students' emotions about the pandemic

While strict social distancing measures were necessary to contain the spread of the coronavirus pandemic, they may have impacted students' mental health. Students were thus asked to report their emotions and their responses were ranked using the non-parametric Friedman test (Table 4). Interestingly, respondents were mostly concerned (mean rank 7.08) and angry (mean rank 6.33), whereas “Panic” and “Despair” obtained the lowest rankings (both received a mean rank of 3.54) (N = 181, Chi-Square = 369.051, df = 8p < 0.001).

To gain further insights into the emotions that the pandemic stirred among students, factor analysis was performed in order to discover if there were common factors which act as axes which shape respondents' views. The investigation indicated that all nine variables were highly correlated and no variable was excluded from further analysis. Before
Table 7
The application of the Friedman test for ranking students’ responses regarding the impact of measures on their daily life.

| Variables                                         | Mean ranks |
|---------------------------------------------------|------------|
| Suspension of administrative services to the public | 5.74       |
| Closure of all educational institutions           | 8.10       |
| Distance teaching                                  | 7.43       |
| Distance semester exams                            | 7.73       |
| Closure of shopping centers and retail stores      | 6.01       |
| Closure of cafés/dining places (including bars, taverns, etc) | 7.58 |
| Suspension of sport events                         | 6.43       |
| Closure of gyms                                    | 6.27       |
| Closure of hotels                                  | 4.91       |
| Restriction on social gatherings                   | 7.38       |
| Restriction on the use of the car                  | 4.64       |
| Restrictions on domestic and international travelling | 5.77      |

N = 181 Chi-Square = 270.647 df = 11p < 0.001

Table 8
Rotated component matrix for the effect of measures to contain the spread of COVID-19 pandemic on respondents’ daily life.

| Component | 1     | 2     | 3     |
|-----------|-------|-------|-------|
| Restriction on the use of the car                  | 0.855  | 0.012 | 0.026 |
| Restrictions on domestic and international travelling | 0.705  | 0.261 | 0.153 |
| Closure of shopping centers and retail stores      | 0.644  | 0.495 | 0.166 |
| Closure of hotels                                  | 0.598  | 0.557 | 0.049 |
| Suspension of administrative services to the public | 0.596  | 0.268 | 0.198 |
| Suspension of sport events                         | 0.152  | 0.857 | 0.095 |
| Closure of gyms                                    | 0.220  | 0.850 | 0.001 |
| Restriction on social gatherings                   | 0.379  | 0.524 | 0.304 |
| Closure of café/dining places (including bars, taverns, etc) | 0.502  | 0.521 | 0.318 |
| Distance semester exams                            | 0.135  | 0.043 | 0.921 |
| Distance teaching                                  | 0.123  | 0.060 | 0.900 |
| Closure of all educational institutions             | 0.128  | 0.360 | 0.718 |

applying the analysis, the Bartlett’s test of sphericity (Chi-square = 558.997, df = 36, p < 0.001), the Cronbach’s alpha value (0.650) and the Kaiser-Meyer-Olkin index (0.749) verified the suitability of the data for factor analysis. Factor analysis loaded three factors after Varimax rotation accounting for 65.1% of total variance (Table 5). According to the factor loadings, negative emotions about the pandemic, ‘Panic’, ‘Fear’, ‘Anger’, ‘Despair’, ‘Anxiety’ and ‘Loneliness’, loaded on the first factor which can be named “Negative emotions”. The variables ‘Anxiety’ and ‘Indifference’ fell under the second factor and this factor can be named “Accumulated negative emotions”. Finally, ‘Optimism’, and “No concern” (it is named “No concern” because the negative sign of the loading indicates the opposite direction of the variable) loaded on the third factor. The third factor can be named “Positive emotions”.

To make a comparison between male and female students in terms of their emotions about the pandemic, t-test was performed. The analysis indicated that female students experienced concern, fear, panic and despair to a higher degree than their male peers. On the other hand, male students were more optimistic than their female counterparts (Table 6).

3.4. Measures to contain the spread of COVID-19 pandemic

Students were asked to evaluate the effect of various measures applied to contain the spread of the pandemic on their daily life. Responses were ranked with the non-parametric Friedman test and, as it can be seen in Table 7, the closure of universities (mean rank 8.10), online exams (mean rank 7.73), online classes (mean rank 7.43) and the restriction of social gatherings (mean rank 7.38) were the measures that had the greatest impact on respondents’ daily life. Conversely, the restriction on the use of the car (mean rank 4.64), the closure of hotels (mean rank 4.91) and the suspension of administrative services to the public (mean rank 5.74) did not affect students significantly.

The impact of the measures on respondents’ daily life was then analyzed using factor analysis with Varimax rotation. The analysis showed that for the multivariate “Measures to contain COVID-19”, Cronbach’s alpha value was 0.882, the Kaiser-Meyer-Olkin measure of sampling adequacy was at an acceptable level of 0.846, and Bartlett’s test of sphericity gave Chi-square = 1119.237, df = 66, p < 0.001. Moreover, three factors were loaded accounting for 68.1% of total variance (Table 6). The variables ‘Restriction on the use of the car’, ‘Restrictions on domestic and international travelling’, ‘Closure of shopping centers and retail stores’, ‘Closure of hotels’ and ‘Suspension of administrative services to the public’ fell under the first factor which can be named “Measures affecting movement and shopping habits”. As for the second factor, this includes the variables ‘Suspension of sport events’, ‘Closure of gyms’, ‘Restriction on social gatherings’ and ‘Closure of café/dining places (including bars, taverns, etc)’. To reflect the content of these variables, the second factor can be named “Measures affecting exercise and entertainment”. Finally, the third factor includes the variables ‘Distance semester exams’, ‘Distance teaching’ and ‘Closure of all educational institutions’ and can thus be named “Measures affecting university”. Interestingly, ‘Distance semester exams’ and ‘Distance teaching’ had the highest loadings.

3.5. Physical activity during lockdown

Daily physical activity can activate metabolism, benefit heart and bone health, as well as boost the immune and respiratory systems. During the 42-day lockdown citizens were allowed to exercise outdoors for an hour every day, either individually or with one more person. In the latter case, they had to keep the necessary distance of 1.5 m between them. Citizens who wished to exercise had to carry their identity card or passport and a completed movement certificate (printed or handwritten) or a confirmation SMS stating the reason for being outside the house. Our results revealed that the students did not avail themselves of the option of daily exercise. In particular, as Table 9 shows only 14.9% of respondents exercised every day whereas 44.7% of respondents exercised only up to two times a week.

Table 9
Frequency and percentages regarding the frequency with which the students took permission to exercise during lockdown.

| Frequency       | Percentage (%) |
|-----------------|----------------|
| 0 times a week  | 18             | 9.9           |
| 1–2 times a week| 63             | 34.8          |
| 3–4 times a week| 44             | 24.3          |
| 5–6 times a week| 29             | 16.0          |
| Over 7 times a week | 27          | 14.9          |
| Total           | 181            | 100.0         |
Finally, as few as 6.6% students did not wish to obtain any information on COVID-19. As it can be seen in Table 10, a considerable share of students (by 28.2%) used television and another substantial share (by 26.5%) used scientific articles. The percentage of respondents who used social media (by 23.8%) was also appreciable. A considerable share of students (by 28.2%) used television and another substantial share (by 26.5%) used scientific articles. The percentage of respondents who used social media (by 23.8%) was also appreciable. Finally, as few as 6.6% students did not wish to obtain any information about COVID-19 (Table 10).

4. Discussion

The most interesting result to emerge from the present study was that the pandemic and the enforcement of stringent social distance measures stirred negative emotions within the undergraduate students who experienced mostly concern and anger during the 42-day lockdown in spring 2020. This finding is consistent with studies indicating that COVID-19 and the uncertainty that suddenly surrounded human life and particularly the areas of health, jobs and economy had negative effects on people’s mental health (Loades et al., 2020; Brooks et al., 2020; Hossain et al., 2020). Respondents’ negative emotions were expected because the pandemic has disrupted profoundly their usual life. That is, before the pandemic, the students were leading exciting lives and were pursuing their academic goals while enjoying a life full of social interactions. Hence, the closure of universities, the requirement to attend online courses and the conduct of online seminar examinations for the first time seem to have caused considerable concern and anger to students. Interestingly, female students experienced fear, panic, concern and despair to a greater degree than their male counterparts who were more optimistic about the pandemic. This finding is intriguing but cannot be explained by this study. Therefore, a future qualitative study with female students could explain why the pandemic and the imposition of strict social measures including the closure of universities induces negative feelings like fear and anxiety more to female than male undergraduates.

Among all measures applied to contain the spread of COVID-19, the closure of universities and the subsequent requirement to attend online classes and exams were those that had the greatest impact on students’ life. Again, changes in university life, rather than changes in transport, circulation, shopping and recreation, seem to be those that mostly affected students. Moreover, restrictions on transport and travelling had only a minor effect on undergraduates probably because they live on a tight budget and they could not afford having a car and travelling anyway.

Another finding that is worthwhile to discuss is that many students did not exercise daily during the lockdown even though Greek citizens could be given permission for one-hour outdoor exercise every day. This was surprising because our respondents are very young people who are not used to spending the whole day at home and thus were expected to make use of the option to exercise daily in order to spend some time outdoors. This could perhaps be ascribed to students’ busy schedule and particularly to their duty to attend online classes and accomplish all tasks digitally. Undoubtedly, this was time-consuming, especially in the beginning of this ‘digital’ period in which students had to deal with issues like delays in scheduled classes, slow Internet connection as well as students’ and professors’ poor familiarization with e-learning platforms. Regardless of the reason why they did not commit to daily exercise, limited exercise during lockdowns is a matter of great concern because regular physical activity and exercise have been acknowledged as significant tools to prevent adverse mental and physical consequences of COVID-19 pandemic (Jiménez-Pavón et al., 2020).

Finally, it was somewhat disappointing that a significant percentage of students resorted to television and social media to obtain information about a severe issue such as the global pandemic. In this Department, students are taught in the beginning of the first academic year how to use multidisciplinary databases with citations and abstracts from peer-reviewed journal literature, books and conference publications while they are also taught the importance of choosing reliable sources. In this regard, the respondents were expected to prefer scientific evidence provided by scholars and experts over the information provided by mainstream media. Hence, this finding raises serious implications for educators while it calls for in-depth investigation. In specific, a future study should examine what type of pages the students “follow” on social media and whether these pages are based on reliable sources such as medical boards or government agencies.

5. Conclusions

Based on the findings presented in this paper and the discussion that followed, it may be inferred that the necessary closure of universities and the requirement to adapt to and cope with distance learning had the strongest impact on undergraduate students who experienced mostly anger and concern during the period of the lockdown. While most students’ emotional wellbeing was affected, female students experienced negative emotions to a greater degree than their male peers who were more optimistic about the pandemic. In order to protect undergraduate students’ emotional wellbeing and ensure progress in their studies despite university closures and other restrictions during health crises, certain recommendations can be made to educators and bodies involved in higher education and student healthcare. Most importantly, mental healthcare services should be established at every university and these services should be reinforced in challenging times such as this one. To help students cope with the difficulties of health crises, experts could provide undergraduates with preventative support and counseling while monitoring their anxiety and depression levels. As young people are more vulnerable to mental health problems due to social distancing measures, students should be advised how to manage negative emotions during lockdowns.

In this study, the impact of the pandemic on students’ life was linked to the sudden quarantine state which led to the disruption of campus life. Online learning became the new normal overnight causing considerable concern to our respondents. To avoid similar reactions in the future and to ensure academic progress during health crises, digital skills and training on using e-learning platforms should become an integral part of undergraduate curricula. Instructors, who are mostly experienced in on-site education, should be trained in remote teaching and learning, and get acquainted with strategies and methodologies. In addition, it is critical to ensure that all students are able to participate in distance learning as, if students’ households lack access to the Internet, students could experience the scarifying event of being excluded from educational activities. To ensure the inclusion of all students, cheaper or free Internet access to disadvantaged households should be offered and,
at the same time, universities could allocate funds to ensure that all students have access to computers and digital infrastructure. Our study revealed that undergraduate students did not exercise daily during the lockdown even though they could avail daily outdoor exercise. Exercise during extended periods of quarantine can prevent negative effects on mental and physical health and thus educators and healthcare experts should inform students about these benefits and encourage them to build regular exercise regimes. This study, however, has certain limitations which ought to be mentioned. Most importantly, the findings of the study represent only Greek undergraduate students who are studying away from home and live in little cities. The findings thus cannot be generalized and do not represent other groups of undergraduate students. Another limitation is that the study examines the effects of the lockdown on students’ mental health during the first pandemic wave in Greece which occurred in spring 2020.

To conclude, the pandemic has put higher education under pressure and universities are required to prove their worth while making the life of young people less precarious and education more resilient. Therefore, the pandemic should be regarded as a valuable opportunity to face issues, such as mental healthcare, inclusivity and on-line teaching which have been inhibiting the evolution of education for decades.

CRediT authorship contribution statement

Evangelia Karasmanaki: Conceptualization, Writing - original draft, Writing - review & editing. Georgios Tsantopoulos: Conceptualization, Methodology, Investigation, Formal analysis, Data curation, Validation, Supervision.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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