



Impact of the COVID-19 Pandemic on Academic, Social, Emotional, and Behavioral Changes in University Students



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Abstract

During the early COVID-19 pandemic, the educational system suffered significant setbacks. Because face-to-face communication opportunities were limited, a modern approach through a distance system was adopted. Most studies have examined the impact of pandemics on the activities and lives of workers, few scholars observe how students cope with the changes. The purpose of this study is to understand the impact of pandemics on higher education students by considering academic, social, emotional, and behavioral changes. More than 10 questions were used in this paper to represent four categories related to students' lives. The study included 1,227 students from five continents: Asia, Europe, America, Africa, and Oceania. The study showed that students have no difficulty learning the available technology to help them with their studies. In addition, they are socially active in different networks, maintain positive emotions and personal hygiene. demonstrating an understanding of the pandemic situation and concern for public safety. The data showed that the shift to online learning did not affect students' attitudes toward education in general. Although the use of social media has increased, students' communication habits have remained unchanged. In addition, even though students wore masks, washed their hands more often, and maintained a social distance, they did so out of a desire to care for the health and safety of others. Future research could focus on comparing student and faculty behaviors, incorporating additional methodologies and/or analysis, and investigating the impact of a prolonged pandemic for comprehensive results.

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1 Introduction

An outbreak of coronavirus (COVID-19) has spread around the world. Authorities around the world-imposed requirements to contain the virus, including restrictions, blockages, and closures of various locations (Maqsood et al., 2021). However, human behavior on the virus during the initial phase of the pandemic contributed to the rapid spread of the virus. This threat acts on the economic, social, and educational aspects of human life (Constantin et al., 2021). This condition affects over 95% of students worldwide. All levels of education, from preschool to higher education, have been forced to adapt their traditional methods to physical distance. According to a UNESCO report, more than a billion students, or 60.5 percent of all enrolled students in more than 100 countries, have suspended their classes indoors (UNESCO, 2022). As a result, educators have adapted their curricula to allow students to participate in distance learning online and on social media and academic platforms (Roblyer et al., 2010). Digitalization in the education sector was growing even before the pandemic hit the world in early 2020. This alternative pedagogical approach has value for those who cannot access higher education through distance, social, or financial barriers (Mishra et al., 2020). The ability of the last two generations to use the Internet for various purposes - from leisure to communication, the implementation of social interaction with academic activities, contributes to the development of distance learning. In the United States, during the pandemic in 2020, people with higher education used social media the most (*Average daily time spent on social networks in the U.S. 2018-2022*, n.d.).

Teenagers spent an average of 65 minutes per day on social media, just over 56 minutes the previous year and 54 minutes in 2018 (*Average daily time spent on social networks in the U.S. 2018-2022*, n.d.). YouTube and Reddit have grown significantly over the past two years. More than 80% of users logged on to YouTube, up from 73% in 2019. Reddit saw a new record of 7% growth in visitors compared to previous numbers in 2019 (Atske, 2021). Other platforms such as Instagram, Snapchat, and TikTok have become more popular, especially among teens and people between the ages of 19 and 29 (Atske, 2021).

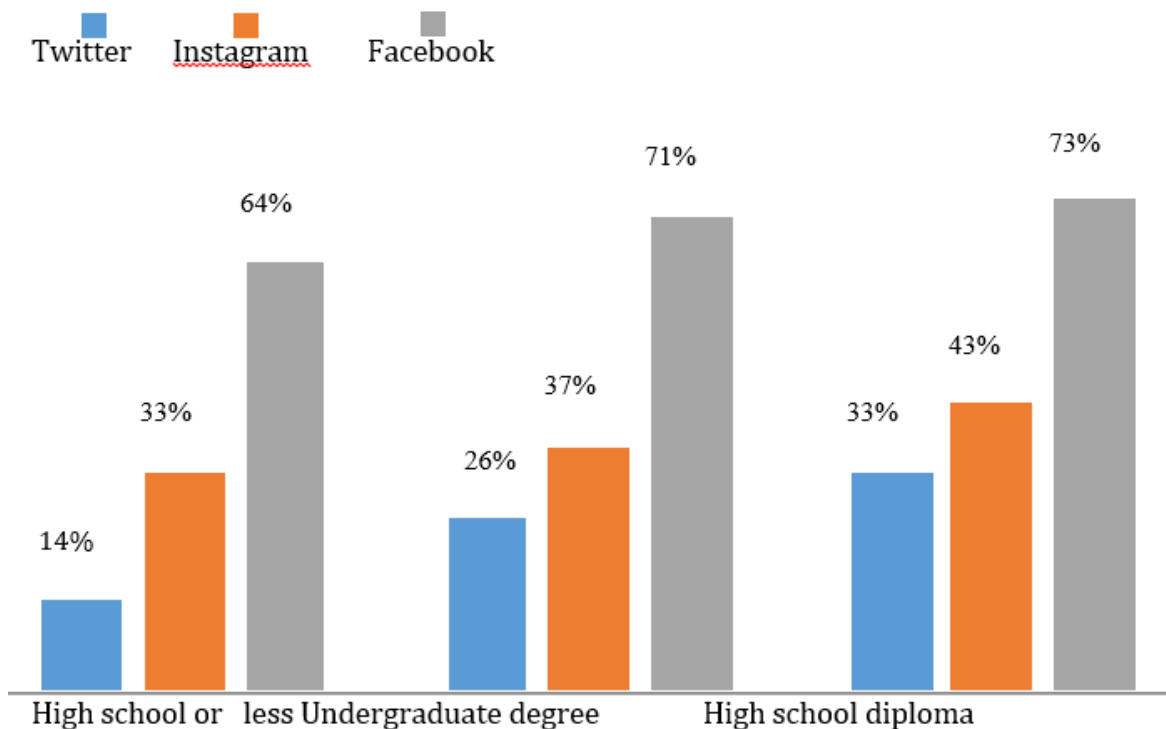


Figure 1. Comparison of social media platform usage in the U.S. in 2021

Source: authors' own research

While the pandemic has provided new opportunities to use technology platforms and changed higher education systems, there are concerns about students' ability to cope with dramatic changes in learning patterns during quarantine and self-isolation (Cohen et al., 2020). During a pandemic, students may face a variety of obstacles to their health, including physical, mental, and social difficulties (King et al., 2020; Cao et al., 2020; Copeland et al., 2021). During prolonged isolation, students may experience increased anxiety, frustration, and hopelessness (Perz et al., 2020; Aristovnik et al., 2020; Tsekhmister et al., 2021). Increasing anxiety about life, in general, can also have a devastating effect on students' mental health, leading to insomnia, depression, and low self-esteem, which can impair performance in school or society (Wilczewski et al., 2021). Recent studies on the subject of COVID-19 effects on populations have included discussions of economic situations, changes in physical and mental health, job satisfaction, ethical conflicts and risk factors, and human behavior in society (Cohen et al., 2020; King et al., 2020; Wilczewski et al., 2021; Goni-Fuste et al., 2021; Contractor, 2022). Previous studies have attempted to describe different periods of the COVID-19 pandemic and often included participants with the same level of education, from the same country or region, the same background, or focused on a particular sector (King et al., 2020; Goni-Fuste et al., 2021; Jia et al., 2022; Khanra et al., 2021; Aslan & Zhu, 2015). One group of researchers attempted to assess the mental health of student-athletes by examining social support and athletic behavior. Their study included 234 participants before and after the pandemic, observing changes in student-athletes' social connections and well-being (Jia et al., 2022). In addition, baseline requirements during uninterrupted distance education in India were examined. The purpose of the study was achieved through a combination of data analysis and literature review, including interviews and surveys (Kunderevych et al., 2022). The results argued that the pandemic accelerated the transformation of higher education, forced educators to adapt quickly and develop appropriate distance learning courses to maintain the quality of the learning process (Moore et al., 2011). Despite some limitations, the researchers concluded that distance learning has great potential for widespread (Korniichuk et al., 2021). Based on previous literature on the impact of the COVID-19 pandemic on higher education, little evidence included a large sample of participants from all five continents to investigate aspects of student life. Subsequently, this study seeks to know the impact of the COVID-19 pandemic on students' academic, social, emotional, and behavioral changes. This study will provide a comprehensive overview of

how distance learning can contribute to student well-being and shape the educational system in the future. The remaining articles will be divided into three sections; research methodology, results and analysis, discussion, and conclusions.

2 Materials and Methods

The study was conducted on the basis of the consultative and diagnostic

Overview of methodology

This article analyzes student responses from around the world to questions related to the COVID-19 pandemic. This study used a publicly available dataset, which can be found at: <https://data.mendeley.com/datasets/88y3nffs82/5/files/9297be4d-24a2-4044-bcca-971d6d34a1a5>. The data were provided by the Faculty of Public Administration at the University of Ljubljana, Slovenia, in cooperation with other universities around the world to explore selected areas of social science during the pandemic in early 2020.

Choice of population

All surveyed students were between 18 and 22 years old enrolled in higher education. The survey was first conducted in English and then translated into several additional languages, particularly Italian, Portuguese, and Spanish, to get more feedback. The survey was distributed through social media and partner universities around the world.

This study uses two formulas to obtain a statistically representative sample of the population.

$$n = \frac{m}{1 + \left(\frac{m-1}{N}\right)}$$

Where 'n' corresponds to a restricted sample population and 'm' denotes an unrestricted population. 'p' is the selected portion of the population from a particular category. 'z' is an estimate of the confidence level by intervals: 99% (2.575), 95% (1.96) and 90% (1.645).

Using this formula for an unrestricted population with a 95% confidence level would require at least 385 participants. A value of 0.5 is usually used when the 'p' value is unknown.

$$m = \frac{(1.96)^2 \times 0.50 \times (1 - 0.50)}{(0.05)^2} \approx 385$$

Data collection

This study collected data from all students around the world who participated in off-campus distance learning at their institution of higher education. A structured questionnaire was used to collect data on respondents' demographics and attitudes toward college and personal life during the COVID-19 pandemic. The data set included a large set of questions, including questions about changes in student behavior during the pandemic in banking, medicine, and government. This article uses questions that are only submitted to institutions of higher education. Because students were asked for their opinions voluntarily, some of the data may not be complete. As a result, this study includes only complete data with no missing value through filtering and deletion to allow for comparative analysis using the previous two formulas and the sample size for the study, the sample population can be determined.

$$n = \frac{385}{1 + \left(\frac{385-1}{10,000}\right)} = 370.76 \approx 371$$

From the data set and exclusions, there are 1,227 valid responses from 61 countries representing five continents. It is argued that these data meet the minimum requirements for representing the sample size in this study.

Data analysis

SPSS version 24.0 was used to achieve the purpose of the study. The data were examined and illustrated using descriptions such as frequency, mean, and standard deviation. Internal reliability and consistency of the data were determined using two approaches of Cronbach's alpha and item correlation. A Cronbach's alpha greater than 0.70 was considered acceptable for analysis. Data were evaluated using a factor loading of 0.5 and 95% significance. Pearson correlation tests were used to examine students' behaviors regarding their citizenship, gender, level of study (undergraduate, graduate, and doctoral), and field of study (social sciences, natural and life sciences, engineering and applied sciences, and arts).

Ethical considerations

The participants were properly informed about the survey. They were all over 18 years of age and enrolled in an institution of higher education. Because participants' personal information was not stored, they remained anonymous and were able to leave surveys at any time.

3 Results and Discussions

Of the 1,227 who participated in the study, the majority (44.99%) came from European countries such as Poland, Italy, and the United Kingdom, followed by Asia (44.58%), the Americas (2.69%), Africa (7.09%), and Oceania (0.65%). All respondents were full-time students. Women made up 67.56% of respondents and men 32.19%. 92.26% of the students were in the process of obtaining a bachelor's degree. Of those students, 40.34% were in social studies, 33.50% were in science, engineering and applied sciences were 18.17% of those surveyed, and arts were 7.99%. Local students dominated this study, 92.75%, compared to 7.25% of international students.

Table 1
Respondent demographics

Continent		Frequency	(%)
Europe		552	44,99%
Asia		547	44,58%
Africa		87	7,09%
America		33	2,69%
Oceania		8	0,65%
Citizenship		Frequency	(%)
Local		1138	92,75%
International	89	7,25%	
Field of study		Frequency	(%)
Social Science		495	40,34%
Science		411	33,50%
Applied engineering		223	18,17%

Art		98	7,99%
Level of education	Frequency	(%)	
Bachelor's		1132	92,26%
Master		65	5,30%
Doctor		30	2,44%
	Gender	Frequency	(%)
Woman	829		67,56%
Man	395		32,19%

Source: authors' own research

The results of the Cronbach's alpha reliability analysis, as shown in Table 2, indicate that the four categories of this study consisted of distance learning and teaching, social life, emotional life, and behavioral changes after the pandemic, had acceptable scores ranging from 0.726 to 0.892. In addition, the study also found correlations between these factors and student demographics in each of the following sections presented in Tables 3, 4, 5, and 6.

Table 2
Cronbach's alpha coefficient for each category

Category	Number of elements	Cronbach's Alpha
Distance teaching and learning	15	0.892
Social Life	18	0.726
Emotional life	20	0.776
Changes in behavior	32	0.765

Source: authors' own research

Distance education and learning

The pandemic led to the closure of traditional academic activities, forcing professors to turn campus classes into online lectures. As teaching online classes became mandatory in higher education, professors felt the technological complexity associated with online education (Ali, 2020). The pandemic led to the closure of traditional academic activities, forcing professors to turn campus classes into online lectures. As teaching online classes became mandatory in higher education, professors felt the technological complexity associated with online education (Ali, 2020; Tsekhmister et al., 2021; Tsekhmister et al., 2019).

Compared to on-site learning, distance teaching and learning requires technological skills and knowledge that focus not only on delivering the course, but also on creating an engaging and enjoyable experience for students to avoid boredom or isolation (Mishra et al., 2020; van der Spoel et al., 2020). Online education also faces the challenge of facilitating two-way communication between instructors and students and between students and their peers (Ali, 2020). To this end, there are methods for recording information, written communication, and real-time video. The results showed that live video (49.39 percent) was the most commonly used method of communication to facilitate learning, followed by presentation mailings (18.74 percent), video recording (12.88 percent). Portal, chat, and other means of communication (11.98 percent). Because of the popularity of video conferencing via Zoom, Microsoft Teams, Skype, or Google Meet, lecturers rarely used audio recording to deliver their courses or materials for academic learning purposes.

Students often contacted their professors to get oversight of their thesis or courses. For the most part, they communicated via video calls (35.29%), text messages via Facebook Messenger, Viber, WhatsApp and WeChat (26.81%) or email communication (24.12%). Students and faculty prefer to use one of the three online forms or a combination of them with different goals or conditions. While video calls can increase motivation and participation by allowing students to see, hear, and discuss with their instructor similar to real-life communication, text messaging or email may not create the same experience as video calls, but may provide more feedback on written assignments, text, and documents.

Table 3
Relationship between aspects of online offerings and teaching to student demographics

Aspect	Citizen	Gender	Level of education	Field of study
Lecture				
Video conference	0.06*		-0.07*	-0.06*
Audio recording				-0.06*
Sending a presentation				-0.07**
Written communication				-0.13**
Communication during observation				
Communicating via email			-0.06*	-0.11**
Call		-0.08**		
Academic work				
Submitting tasks	0.06*			-0.08**
Accepting edits	0.07*			-0.07*
Time feedback	0.09**		-0.09**	
Openness to suggest changes			-0.08**	-0.08**
Teaching and learning environment				
Difficult to focus on		-0.06*		
Challenging tasks		-0.07*		

Source: authors' own research

*correlation significant at the 0.05 level; ** correlation significant at the 0.01 level

Despite the ease of communication during academic online teaching and learning, the results indicate that just under half of higher education students (44.42 percent) experience an increase in their academic workload compared to pandemic conditions. Some (27.30 percent) said their tasks remained the same, while the rest (28.28 percent) said their workload in the online classroom had decreased. A small amount of online teaching load can be found in all five continents, but it is dominated by Asia (53.60%) and Europe (36.60%). Although only a small percentage, less than 9% is found in the Americas, Africa, and Oceania.

Social life

Humans are social beings who need social interaction to maintain strong bonds and build support systems in the community, which is good for both emotional and physical health. During the pandemic, human interaction was greatly reduced as a result of social distancing and quarantine, forcing people to stay locked in their homes during the outbreak. In the long term, this condition can lead to various physical and mental health problems, including obesity, diabetes, frustration, depression, and anger (Cao et al., 2020). Social connections affect people's well-being, and those who maintain relationships with family and friends can avoid the stress and traumatic condition (Aristovnik et al., 2020; Contractor, 2022; Jia et al., 2022; Korniihuk et al., 2021). During the pandemic, students interacted with family members (44.09 percent), close friends (30.15 percent), a roommate (42.22 percent), and visited social media several times a day (34.88 percent). In addition, students communicated with distant family members up to three times a month (23.80 percent) and with campus colleagues several times a week (25.84 percent). Unless necessary, students avoided contact with administrative staff, faculty, or volunteer organizations during a pandemic.

Emotional life

In the long run, the pandemic can have an impact on the mental health and emotional well-being of adults, including students. The results confirmed that students experienced both positive and negative emotions while taking online classes or preparing for exams. These negative emotions included frustration (35.29%), anger (36.02%), anxiety (33.33%), and boredom (30.81%). While positive emotions such as joy (39.36%), hope (36.10%), pride (37.00%), and relief (45.40%) appear in the results. With scores ranging from 27.55 to 30.40%, students express concern "a significant amount of the time" about their current education, finances, relationships, daily activities, future education, and professional career. Students occasionally express concerns about their physical and mental health (31.38 % and 27.61%, respectively), and not being able to travel to other countries (30.56%).

Table 4
Correlation of aspects of social life with student demographics

Aspect	Citizen	Gender	Level of education	Field of study
Communication				
Close family member				-0.06*
Close friend				-0.10**
Roommate				-0.08**
Colleague				-0.07*
Professor			-0.07**	-0.08**
Administrative Staff	0.08**	0.06*		
Topic of discussion				
Future of education		-0.07*		
COVID-19 crisis		-0.07**		

*correlation significant at the 0.05 level; ** correlation significant at the 0.01 level

Students turn to family members in most situations during the pandemic, including illness (79.63%), future education (41.48%), personal finances (69.48%), professional career advice (45, 72%), and discussion of COVID-19 crisis (46.29%). On the other hand, students prefer to discuss their feelings (36.43%), schoolwork (38.22%), future learning (29.34%), and relationships (46.86%) with a friend. Occasionally, they also meet with their peers when academic issues arise (25.67%).

Table 5
Correlation between aspects in emotional life to demographic of students

Aspect	Citizen	Gender	Level of education	Field of study
Emotion				
Pride				-0.09**
Anxiety				-0.06*
Tough		0.14**	-0.06*	
Hopelessness		0.08**		
Concern				
Learning		0.07**		
Future Education		0.07*		
Family and relationships				-0.06*
Future Crisis		0.07*		
Travelling abroad	0.08**	0.06*		

*correlation significant at the 0.05 level; ** correlation COVID-19 crisis

Source: authors' own research

Changes in behavior

During the pandemic, health authorities strongly encouraged hygiene practices such as regular hand washing, wearing a mask in public places, and taking any other precautions necessary to prevent COVID transmission between people. Students also followed these daily routines while in a pandemic situation, demonstrating their awareness of the threat of the disease to their health and their circle, including close family members, neighbors, co-workers, and friends. Most students indicated that they engaged in more of these activities after the pandemic than before it, including avoiding large crowds, trying not to touch their faces, minimizing travel, working from home, avoiding public transportation, wearing a mask outside, and helping others. Other activities, such as leisure time, shaking hands, and visiting family or friends, were greatly reduced or even eliminated. Some activities remained unchanged before and during the pandemic, such as grocery shopping, filling prescriptions, shopping online, and relaxing or exercising routinely

Table 6
Relationship between aspects of behavioral change to student demographics

Aspect	Citizen	Gender	Level of education	Field of study
Pandemic Habit				
Миття рук Hand washing		0.13**		
Avoiding touching the face		0.06*		
Shaking hands		-0.14**		
Stocking up on necessary items		0.06*		
Getting out of the house	0.06*			
Avoiding crowds				0.13**
Canceling a trip		-0.08**		0.06*
Working from home		-0.08**		0.07*
Avoiding public transportation		-0.08**		0.06*
Wearing a mask on the street			0.09**	0.09**
Offering to help people		0.06*		
Resting or Training		-0.06*		
Visiting family members or friends		0.08**		-0.09**
Habit after a pandemic				
Hand washing		0.13**		
Avoiding touching the face		0.08**		
Shaking hands	-0.07*	-0.06*		
Stocking up on needed items		0.10**	-0.06*	-0.06*
Getting out of the house		-0.13**		
Avoiding crowds	-0.06*	0.08**	-0.06*	-0.06*
Canceling a trip		0.13**		
Working from home		0.09**	-0.09**	
Avoiding public transportation	-0.07*	0.09**		
Wearing a mask on the street		0.16**	-0.11**	0.06*
Offering to help people		0.07*		
Visiting family or friends		-0.06*		-0.06*

*correlation significant at the 0.05 level; ** correlation significant at the 0.01 level

The COVID-19 pandemic has affected almost every aspect of human activity, especially university students. The sudden change in academic activities from traditional on-campus methods to distance learning can be stressful not only for students, but also for faculty and administrative staff. In examining this situation, it is important to understand the impact of the global pandemic on the lives of students around the world. We

used a representative sample of 61 countries and all five continents. The sample included both men and women, as well as domestic and international students. We tested students' attitudes, thoughts, feelings, and behaviors to see how the COVID-19 pandemic affected their lives. The purpose of this study was to understand the condition of college students ages 18 to 22 during the COVID-19 pandemic in terms of academic, social, emotional, and behavioral changes. Students experienced sudden changes from the classroom to distance teaching and learning. These changes were prompted by the seriousness of the infection at the beginning of the pandemic and the corresponding health department guidelines on how people should interact with each other. Because face-to-face communication must be limited to prevent the spread of the virus, social distancing measures made it impossible to continue teaching in the traditional mode. Lectures had to be limited, and most communication now took place through digital means. Students sent messages and made phone calls to their family and friends. They used email and university learning platforms to communicate with their professors. Cherry from the popularity of video conferencing (Zoom, Microsoft Teams, Skype, Google Meet, and others), live video communication was the most commonly used method of communication to facilitate learning. Several studies have confirmed this finding, demonstrating that most students can easily adapt to the digitalization of learning processes (van der Spoel et al., 2020). Students' daily activities, which included extensive use of social media to communicate with peers and families, contributed to a smooth transition to distance learning. In addition, a basic understanding of technology allows students to use and combine different modes of communication: video calls, text messages, and email. As a consequence, it is very important for institutions of higher education to maintain effective distance learning, given the institution's resources and the technical expertise of its faculty and students. Professors needed to adapt quickly to distance learning and not only learn how to use technology, but also how to use technology to make their lessons interesting for students.

While most students experienced an increased workload during online learning, others felt the opposite. Asia and Europe are the two continents that showed significantly reduced student workload during distance learning compared to the Americas, Africa, and Oceania. In the early months of COVID-19, when most places, especially recreation, were closed or restricted around the world, most students maintained their social lives through various means of communication. Most of them interacted daily with close family members, close friends and neighbors, and consumed online social media. Students preferred to discuss personal feelings, future education, professional careers, and potential crises with family members. Students like to share information with their close friends about learning, family, and relationships. All of these activities benefit people's mental health by helping them avoid mental health problems, such as depression or stress, often associated with prolonged social isolation.

The pandemic has forced significant changes in students' daily routines to protect themselves and the circle from infection. Students are encouraged to wash their hands more often, avoid crowds, minimize travel, work from home, avoid public transportation and wear masks outside. In addition, the pandemic encourages students to stay in touch with their close contacts, exercise more often and avoid travel. Comparing behavior in and during the pandemic, students were less likely to leave home, avoid crowds, and not visit friends and family in person as often. There was little change in handwashing behavior, touching the face, using public transportation, working at home, and helping others. Some students chose to stock up on necessities. Some students wore masks outside and some did not. Handshaking was not common among students in higher education before or during the pandemic.

4 Conclusion

Higher education has been hit hard by the pandemic, prompting many students and faculty around the world to quickly transform their current educational programs through the use of modern technological platforms. Subsequently, it is very important to understand how the pandemic has affected students' academic, social, emotional, and behavioral changes. This study shows that students have had no trouble assimilating available technology to support their academic activities or communicate with their professors during online classes or tutoring. In addition, this study found that distance learning tends to impose more stress on students than on-site instruction by pandemic.

Despite blocking and restricting travel to other regions and countries, students can still manage their social interactions with whatever mode of communication they feel is best. Students make connections with whom they feel comfortable communicating and this affects the frequency of their interactions. Students interact daily with their immediate family, close friends, roommates, and through online social media. Higher education students rarely communicate with their peers or university administrative staff. Topics of conversation include: current events and news, work, learning, and health.

Although pandemics can be frustrating for higher education students because of their physical isolation, most experience positive emotions such as joy, pride, hope, and relief. In addition, they often adopted hygienic behaviors, washed their hands, avoided large crowds, did not travel, worked from home, avoided public transportation, and wore masks outside, demonstrating their awareness of the pandemic and concern for public safety. Although the study found little impact of the pandemic on students' attitudes toward education, health, and satisfaction, it is important that stakeholders in higher education and health authorities collaborate and develop mitigation strategies to overcome the negative impact of a prolonged pandemic on students.

This study revealed several limitations that can be addressed in the future. First, students' responses were not evenly distributed across continents or across countries within a single continent. Second, students' answers may differ from their actual feelings, thoughts, and actions as people tend to project a positive view of themselves or those in their immediate environment. Third, the questions cannot cover all aspects of student behavior. Based on this limitation, future research should add more detailed variables that are not included in this paper, compare student and faculty behavior, and include additional methodologies and analysis to ensure comprehensive coverage of the higher education sector.

Different directions can investigate the emotional, physical, and social impact of higher education students during a prolonged pandemic. Research could focus on vulnerable groups of students suffering from anxiety or depression to better understand how to support them. It would also be interesting to learn how student behavior has changed from the beginning of the pandemic to the present to identify new adjusted behaviors based on legal and societal constraints.

Acknowledgments





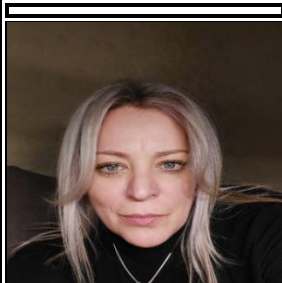
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