GENERAL NURSING EDUCATION DURING THE COVID-19 LOCKDOWN AND THE COMPARISON WITH THE PRE-PANDEMIC AND POST-PANDEMIC OUTCOMES

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Abstrakt

Background: COVID-19 has affected the educational systems across the world. During the lockdown period, the General Nursing Care studies – in the form of the Distance Educational Program of our university - took place only using a remote form of teaching via the online plat-form with the exclusion of regular contact sessions. This study aimed to assess the objective results and the satisfaction rate of the students attending the course of Anatomy during this alternative form of teaching and compare them with ones from previous and subsequent unaltered academic years; Methods: For this study, we used the online questionnaire method and the analysis of the official students' results (Number of students, who were able to pass the final ex-am successfully and number of students, who discontinued their university studies after the first year); Results: While maintaining the same syllabus, teaching materials and study conditions within the study of Anatomy during the COVID pandemic, the exclusion of contact sessions resulted in the decline of both – success and satisfaction rates within the given subject and the education mentioned above at the university. Two years after the pandemic, we realized an increase in both parameters, but the success rate was not at the same level as before the pandemic; Conclusions: We discuss the remote form of teaching as the enforced alternative under the state of emergency, not as the possible standard in the education in health sciences. Disruption of the education system still has recognizable consequences even two years later.

Klíčová slova: COVID education, General nursing, Anatomy teaching, pandemic outcomes, remote education.

INTRODUCTION

The COVID-19 pandemic, which spread across the globe in 2020 and 2021, had a tremendous impact on educational systems like never before. This global health crisis forced educational institutions worldwide to adopt alternative teaching methods, leading to numerous challenges and limitations in so-called COVID education, which arose as a result of the transition to remote learning during lockdowns (Daniel, 2020). Since then, countless articles have been published about these challenges and limitations, with experts focusing primarily on the shift to distance learning, issues with technology, the lack of social interaction between students and teachers, and the deterioration of practical education. However, the pandemic also brought certain opportunities based on new findings discovered through these alternative teaching methods (Zhao & Watterston, 2021). These opportunities included innovative methods of distance learning and the potential for broader integration of technology into educational systems even after the pandemic had subsided. A very specific group of students that was significantly impacted by pandemic educational conditions were students in the health sciences. This group included residents (Figueroa et al., 2020), medical students (Ferrel & Ryan, 2020), and nursing students, who had to face extraordinarily challenging conditions both in their education and their work. In many countries, these students were required to fulfill government duties in overwhelmed hospitals and field medical facilities (Muñoz-Rubilar et al., 2022; Michel et al., 2021), working exhausting shifts, often under great stress, and in conditions that demanded additional professional training and education (Taylor et al., 2020). From our point of view, a special category of students that were impacted not only educationally but also in the workplace were nursing students in distance learning programs.

These students are mostly healthcare professionals working as hospital attendants while simultaneously studying university programs to improve their qualifications and become registered nurses. At our university, the teaching of the General Nursing Care course takes place within a distance learning program, which is certified as a distance program with regular contact sessions, usually held every other weekend from Friday to Sunday. This program lasts for three years and, after passing all exams, concludes with a bachelor's degree and certification that qualifies graduates to become registered nurses. During the COVID-19 lockdowns, however, this program was conducted solely through distance learning via an internet platform, and all regular contact sessions were canceled. This study aimed to assess the objective results of this distance learning program during the pandemic period and to evaluate the satisfaction rate of students who had to contend with the most demanding course in the first year, which is the Anatomy for Nurses course. We also compared the results of these students with those of students who attended the distance learning program combined with contact sessions during the academic year before the pandemic and two years after the pandemic began. In all four of the academic years under consideration, the one-semester Anatomy for Nurses course was based on the same study material. Students had free access to the study textbook and a human anatomy atlas.

The course organization followed the same curriculum and time schedule, with three mandatory online tests administered during the course. To earn credit, students had to pass at least two out of the three tests. Afterward, students could undergo an oral examination to finally pass the course. The eighteen hours of contact sessions, which were usually divided into four study days, were replaced during the pandemic semester with remote sessions following the same schedule. These were conducted using the BigBlueButton online teaching platform (www.blue.ujep.cz), which allowed teachers to share PowerPoint presentations and enabled both teachers and students to ask and answer questions. All students were provided with technical support from the university, and all students were able to connect to the online sessions without technical difficulties.

MATERIALS AND METHODS

Our experimental group consisted of four distinct cohorts of nursing students across different academic years. Specifically, we included 45 students who participated in the contact study format during the academic year 2019/2020. These students had the opportunity for in-person, face-to-face interactions with instructors during their study sessions. In contrast, during the academic year 2020/2021, 35 students were enrolled in a completely non-contact, remote study format. This group had no physical contact with instructors or peers, and all teaching was conducted online due to the COVID-19 pandemic lockdowns. In the following academic year, 2021/2022, 52 students resumed attending the contact study format as the situation allowed for a return to in-person classes. Finally, in the academic year 2022/2023, the contact study format continued, with 68 students attending. All of these students were enrolled in the General Nursing Care program, specifically in the Distance Educational Program, and our research focused on analyzing the outcomes of the first fall semester, particularly in relation to the Anatomy course for nurses.

Across these experimental groups, demographic analysis showed that 77.8 % of the students were female, 22.2 % were male, and no students identified as undefined or another gender. The average age of the nursing students was 33.37 years, with a standard deviation of ±12.1 years, indicating a wide range of student ages. This reflects the diverse demographic often found in distance learning programs, where adult learners may return to education later in life to enhance their qualifications. Data collection for analyzing the students' satisfaction with the course was carried out after each semester. This was achieved by providing all students with a link to a questionnaire, written in Czech, hosted on the Survio internet platform (www.survio.com). The questionnaire was distributed via an official university mailing list, specifically accessible to the course instructors. For the purpose of this research, we selected eight key questions from the questionnaire, which students were able to answer with a simple Yes or No response. These questions were designed to assess various aspects of the course and included the following:

1. Were the lectures interesting?
2. Were the lectures comprehensible?
3. Were the lectures understandable?
4. Was the course well-organized?
5. Did the course provide a theoretical background for my future career?
6. Was the study textbook valuable?
7. Was the testing form fair?
8. Was the testing reflective of the course content?

To quantify students' overall satisfaction with the course, we developed an Overall Satisfaction Rate, which was calculated as the average of all the positive responses to the above eight questions. The response rate for the survey was 58 %, which provided a substantial dataset for analysis. All student data from the university's study administration system were used to evaluate objective outcomes in terms of academic performance and continuation in the program. The objective study parameters that were established for evaluation included:

1. The number of students enrolled in the first year of the nursing study program.
2. The number of students who successfully passed the Anatomy course.
3. The number of students who discontinued their studies after the fall semester, indicating potential dropout rates.

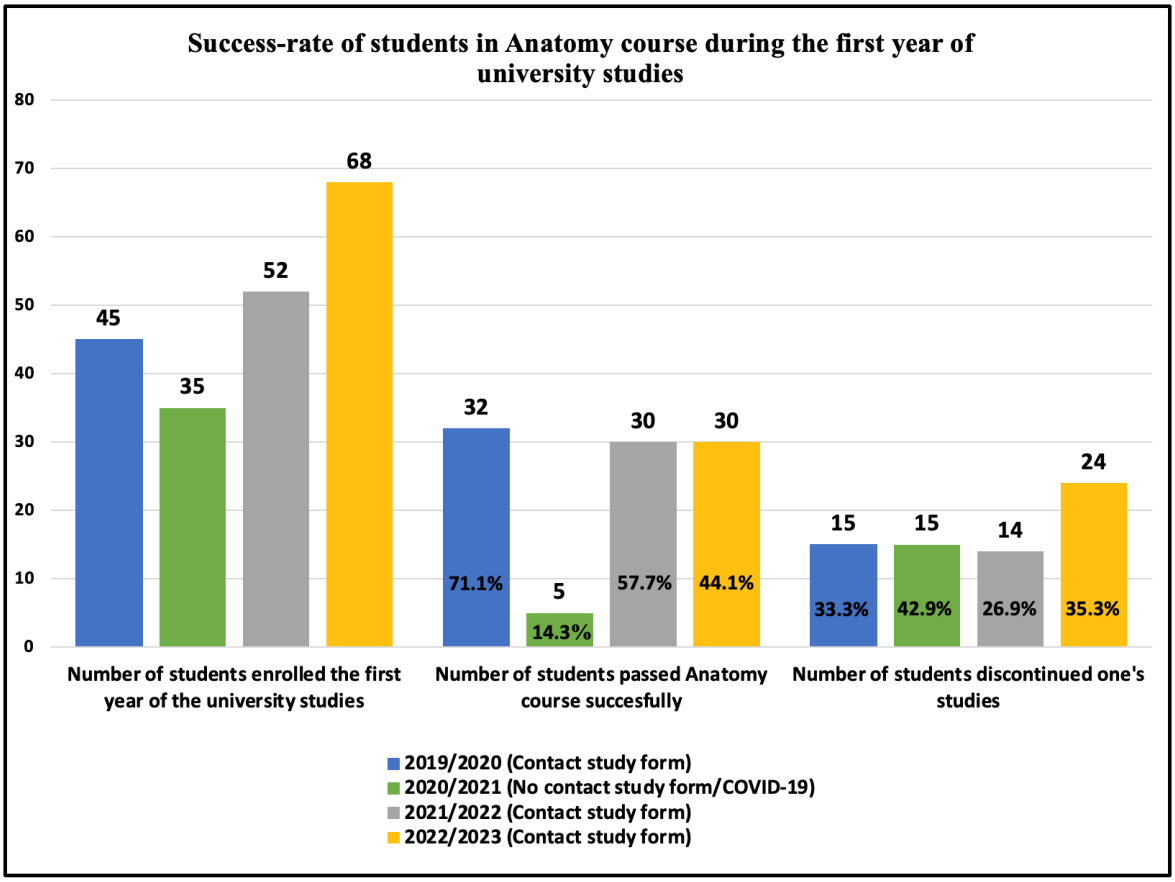
This research did not encounter any conflicts of interest. Furthermore, the study was conducted with full approval and oversight from the Dean of the Faculty, ensuring that ethical standards were met throughout the research process. By examining both subjective satisfaction metrics and objective academic outcomes, this study aimed to provide a comprehensive understanding of how different teaching formats, particularly the fully remote format during the pandemic, affected nursing students' learning experiences and success rates in one of the most demanding courses in their curriculum.

RESULTS

During the COVID pandemic, there was a noticeable downturn in the number of students commencing their nursing studies in a blended format. This trend can likely be attributed to the challenges and uncertainties brought about by the pandemic. However, following the cessation of the pandemic and the remote educational measures that were put in place, the subsequent years saw a rebound in student enrollment figures, which interestingly surpassed those seen prior to the pandemic's onset. It seems that the end of the pandemic and its restrictions may have stimulated a renewed interest or ability to pursue higher education, particularly in the field of nursing. In regard to student performance, there was a clear divide between different learning formats. Students participating in contact-based studies consistently demonstrated higher success rates, as evidenced by the data presented in Figure 1. The contrast is stark when comparing the success rate of students at the end of the remote Anatomy course—where a mere 14.3 % succeeded—with the significantly higher success rates of 71.1 % before the pandemic, and 57.7 % and 44.1 % after the pandemic. This suggests that while remote learning provided critical continuity of education during the pandemic, it may not have been as conducive to student success as traditional contact-based forms.

The rate at which students discontinued their studies also underscores the impact of the pandemic on educational pursuits. The absence of in-person sessions seemed to correlate with a higher discontinuation rate among students during the fall semester of the COVID-19 academic year. Nevertheless, once the pandemic waned and traditional learning environments were reinstated, these discontinuation rates rapidly reverted to the pre-pandemic norm, indicating that the structure and support of contact sessions play a vital role in student retention and academic success.

Figure 1. Success rate of students in Anatomy course during the first year of university studies



Except for the 'Understandability of the lectures' question, students were more satisfied with the contact study form for all questions. At the same time, the 'Overall satisfaction rate' was higher in this group of students. Satisfaction rate during the contact study form two years after the pandemic rose to values higher than those before the pandemic, across all questionnaire items (Table 1).

Table 1. Satisfactory rate of students in the Anatomy course during the first year of university studies

Form of Study	Academic Year	A	B	C	D	E	F	G	H	I
Contact study form	2019/2020	92.9%	92.9%	100.0%	50.0%	71.4%	53.3%	100.0%	92.9%	81.7%
No contact study form/COVID	2020/2021	69.2%	86.6%	100.0%	38.5%	46.2%	38.5%	92.3%	84.6%	69.5%
Contact study form	2021/2022	92.9%	100.0%	100.0%	100.0%	85.7%	92.9%	92.9%	92.6%	94.6%
Contact study form	2022/2023	92.3%	100.0%	100.0%	100.0%	92.3%	92.3%	100.0%	100.0%	97.1%

Legend: A = Lectures were interesting; B = Lectures were comprehensible; C = Lectures were understandable; D = Course was well organised; E = Courses provided a theoretical background for my future career; F = Used study textbook was valuable; G = Testing form was fair; H = Testing was reflective of the course content; I = Overall satisfaction rate

DISCUSSION

During the pandemic year 2020 we were forced to modify all contact sessions of the Anatomy course of nursing in the faculty of health studies of our university to a remote form of teaching via the online platform. Many fields of study were affected, but the greatest complication this change caused at our faculty was with the students of nursing in the distance learning format. This is precisely why we focused on this group in our study. The previously existing and officially accredited format of distance learning with regular contact meetings with the teacher was replaced during the COVID-19 pandemic solely by online lectures. These lectures were of the same length, accompanied by the same instructional presentation, and covered the same content as in-person lectures. Despite maintaining the same study materials, conditions of study, and conditions for passing the course, the exclusion of contact lectures led to a significant decrease in the success of most students. We continued to monitor this parameter to some extent even after the end of the pandemic, i.e., after the return to the contact form of distance study. Although there was some improvement for these students, to our surprise, we found that even after two years, there was no return to pre-pandemic values. According to the literature, the remote form of teaching brought a number of challenges to global education, depending on the level of education. For teachers who were forced to apply the remote form of education, the acquired experience raised questions about how to effectively engage their students in learning, how to maintain their attention, how to deal with potential poor internet connections, and overall, how to organize such a virtual class to make teaching effective (Neuwirth et al., 2021). The goal of our study was not to analyze the feelings and satisfaction of all teachers when changing the form of teaching. Considering my own feelings, as the main lecturer of the taught subject, I must state that for me, the remote form, apart from the absence of the possibility of immediate nonverbal feedback from students in the auditorium, did not bring any relevant change. Given the setting of a uniform concept of combined study, which has been functioning at our faculty for a long time, and which is based on the need for more frequent independent home study by course participants, we assumed when planning the COVID-19 education that we could maintain the same format, and thus the original lectures, presentations for contact sessions, and electronic tests for continuous verification of student knowledge. According to the results of our study, it was noted that even with the same educational materials, there was a significant change in satisfactory rates. There was a decrease in the comprehensibility of the discussed material, the educational materials used, and also the organizational scheme of the teaching.

From the literature, we know that an analysis of students' experiences has brought about a number of interesting findings globally. For many students, remote education was stressful, and some had to learn to work with certain types of electronic devices for the first time. Students with children repeatedly faced problems with deteriorating concentration and study opportunities due to the long-term presence of children at home during the closure of elementary schools. Moving education into homes led in some cases to irritability among the partners of students, who were far more exposed to their counterpart's study matters. For some students, the necessity of purchasing a computer or establishing a stable internet connection posed a significant economic problem. On the other hand, some students appreciated saving time by not having to travel to university campuses (Sulimam et al., 2021). Some studies report opposite results in the satisfaction of healthcare students with the remote form of education in anatomy, where students preferred the ability to self-schedule their studies, the possibility of repeatedly playing back educational materials, and increased study time. All this then led to better study outcomes (Yoo et al., 2021).

A meta-analysis on this topic indicates that more studies report a decrease in satisfaction rates when contact forms of anatomy education are excluded. It also summarizes that the contact form of education cannot be replaced, but that a multimodal learning approach combining online with face-to-face educational modalities can be effective and can bring many benefits to traditional education (Abualadas & Xu, 2023). A very sensitive and vulnerable group of students during the COVID pandemic were students with disabilities. It was this group that gained certain advantages from remote education, from which they still benefit today. For example, the problem of often complicated transportation or accommodation was eliminated (Li et al., 2023). During online teaching, many educators optimized existing educational materials. These were often converted into electronic form for the first time, in which they were usually available to students for a long term (Hashey & Stahl et al., 2014). Healthcare students were at a disadvantage with the limitation of the practical part of their education because the restriction of many healthcare operations during pandemics resulted in limited opportunities for student encounters with "live patients". This measure led to the development of web-based learning, role play, video vignettes, and both live and mannequin-based simulated patients, which minimized disruptions to medical education (Lim et al., 2009).

A significant portion of healthcare students' education is clinically and practically based (Dewart et al., 2020). However, our students were only at the beginning of their studies and were assessed only on the non-clinical, theoretical subject of anatomy. In assessing the quality of healthcare education during the COVID-19 pandemic, great emphasis was placed on the possibilities and limits of alternative forms of education. A circumstance that must not be overlooked, and which was encountered by healthcare students in several countries, was the previously mentioned possibility of mandatory work assignments (Muñoz-Rubilar et al., 2022). Nursing students in the distance learning format at our faculty are mostly longterm active healthcare professionals who are only enhancing their qualifications through education. Therefore, they were certainly affected by the statistics of studies, which, for example, in the USA and UK found up to a twelvefold increase in the incidence of COVID-19 among frontline healthcare workers compared to the general community (Nguyen et al., 2020). Healthcare professionals during COVID were burdened with significant stress from the possibility that they could infect and thus endanger their family (Ayanian, 2020). The relative riskiness of healthcare professionals in relation to the general society was also perceived from the other side, where healthcare professionals were excluded from social contacts outside of their work due to the irrational fear of infection they could "bring" from their job (Bagcchi, 2020). Constant psychological stress among healthcare professionals often led to the development of burnout syndrome (Lai, et al., 2020). According to some reports, nurses were more inclined to leave not only their workplace but also the profession in the wake of the COVID-19 pandemic (Maniscalco et al., 2024). This conclusion could be related to the tendency we reported of students during the COVID-19 pandemic to completely abandon their studies after the first failure of the anatomy exam. An important sentiment among healthcare professionals during the pandemic was also decreased social support (Galanis et al., 2021).

All the mentioned changes in healthcare professionals' attitudes and specifically nurses towards their work have also been evident in the following years. As early as 2021, there was a significant increase in nurse turnover in the USA (Falatah, 2021). In the years after the end of the COVID-19 pandemic, there were fundamental changes in nursing education in the USA that became more particularly related to disaster and public health preparedness, health equity, and technology (Leaver & Stanley, 2022). Some works highlight the necessity of adopting new knowledge from nursing education during the pandemic so that the system is well prepared for further future extraordinary circumstances and situations (Bassi et al., 2024). One of the substantial recommendations for the transformation of nursing education was persisting in the solutions adopted during the pandemic by maintaining remote lessons (Silence et al., 2021). Of course, outside of nursing, the knowledge about education during the pandemic is also seen as an opportunity for further development. One of the defining parameters is that significant changes occurred worldwide. Development will lead to a change in curricula for individual educational programs. These will become more based on strengths and passions and become personalized. Quality online education will continue to spread, and the parameters set during the pandemic will become the main part of education for a large group of students. The absence of technology in certain social groups and regions of the world will then bring another challenge for society, how to make global education justly accessible (Zhao & Watterston, 2021). Indeed, the further expansion of inequality based on demographic foundations in the post COVID-19 pandemic era is one of the most common phenomena (Donnelly & Patrinos, 2022).

CONCLUSIONS

The COVID-19 pandemic has led to substantial changes in global education, notably through the incorporation of information technology and the advancement of distance online education. Numerous countries and academic institutions conducted early evaluations of their existing educational programs, encouraging faculty to continue developing the education system. Many educators view the COVID era as a period that catalyzed an unprecedented acceleration of educational evolution. Conversely, the systemic changes and altered availability of education during the pandemic period introduced various negative aspects, chiefly a decreased accessibility to education for vulnerable and disadvantaged student populations. Among the professionals most impacted during the COVID-19 pandemic were nurses. They faced increased workloads and work/family stress, leading to a higher incidence of workplace changes and a measure of emancipation among many nurses. These circumstances are consistent with the findings of our study, which demonstrated an elevated need for further education (a rise in the number of students enrolled) as well as increased motivation among these healthcare professionals, namely the student nurses in a distance learning format. This motivation is evidenced not only by a decrease in the number of students discontinuing their studies but also by a higher satisfaction rate. To conclude, we offer several recommendations for good practice:

Blended Learning Approach: Incorporate a blended learning model that combines the flexibility of online education with the benefits of in-person sessions, especially for courses requiring practical skills.

Enhanced Online Resources: Develop comprehensive online resources, including virtual labs and interactive materials, to better simulate in-person learning experiences.

Student Support Systems: Establish robust support systems for remote learners that can provide academic, technical, and emotional support to students.

Feedback Mechanisms: Implement regular feedback mechanisms to monitor student satisfaction and learning outcomes in real-time, allowing for prompt adjustments to the teaching approach.

Skill-Based Assessments: Design assessments that can accurately measure practical skills, even when taught remotely, to ensure that learning outcomes are not compromised.

Teacher Training: Provide additional training to educators in the delivery of online education to enhance their teaching methods and engagement strategies.

Technology Infrastructure: Invest in technology infrastructure to support a high quality online learning environment, ensuring that all students have equal access to educational resources.

Long-Term Studies: Conduct long-term studies to assess the outcomes of different teaching methods, to guide evidence-based decisions in curriculum design post-pandemic.

Policy Development: Develop policies that provide guidelines for emergency transitions to remote learning to minimize educational disruptions in the future.

Community Building: Create opportunities for students to build a community and network with their peers and professors, to compensate for the loss of in-person interaction.

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