

The relevance of modifying the remote modality in the educational scope in universities in proportion to the expansion of SARS-CoV-2

A relevância da modificação da modalidade remota no âmbito educacional em universidades proporcionalmente a expansão do SARS-CoV-2

La pertinencia de modificar la modalidad a distancia en el ámbito educativo en las universidades en proporción a la expansión del SARS-CoV-2

Received: 12/19/2022 | Revised: 01/09/2023 | Accepted: 01/11/2023 | Published: 01/13/2023

Kathlyn Joyce de Jesus Oliveira

ORCID: <https://orcid.org/0000-0003-3280-8488>

Noble University Center, Brasil

E-mail: kathlynoliveira@outlook.com

Mônica Odília Magalhães Dias

ORCID: <https://orcid.org/0000-0002-7477-5162>

Christus University Center, Brasil

E-mail: monicaomdias@gmail.com

Natália Vasconcelos de Souza

ORCID: <https://orcid.org/0000-0002-6082-0743>

Christus University Center, Brasil

E-mail: nataliavsouza@gmail.com

Hudson Pimentel Costa

ORCID: <https://orcid.org/0000-0002-9973-6100>

Mauricio de Nassau University Center, Brasil

E-mail: professorhudsonpimentel@gmail.com

Abstract

Considering the adaptations in the educational scope made as a result of the pandemic condition associated with the SARS-CoV-2 microorganism, this work aims to evaluate the impact of the remote modality in higher education institutions during the current pandemic period. Therefore, a systematic literature review was carried out, associated with exclusion criteria that include theses, dissertations, or works published in annals and databases such as PubMed. Several public and private institutions have adopted pedagogical didactic strategies due to the widespread of COVID-19, aiming to offer greater academic support to students due to the isolation measures required by government agents, generating changes in the conventional study environment, so as not to compromise the learning of students. higher education students. Among the main problems pointed out by the students who evaluated the remote modality, there is the impairment of concentration, learning difficulties, as well as the absence of an environment conducive to academic dedication. However, it appears that the pandemic state has brought about changes in higher education institutions, including the emergence of new problems such as the lack of autonomy in students in the learning aspect and the need to build methodologies aimed at engaging the student, enabling the continuity of the process pedagogical.

Keywords: Learning; Students; Institutions; Pandemic.

Resumo

Considerando as adaptações no âmbito educacional efetivadas em decorrência da condição pandêmica associada ao microrganismo SARS-CoV-2, este trabalho possui o objetivo de avaliar o impacto da modalidade remota em instituições do ensino superior no período da atual pandemia. Portanto, efetuou-se uma revisão de literatura do tipo sistemática associada a critérios de exclusão que incluem teses, dissertações ou trabalhos publicados em anais e base de dados como o PubMed. Diversas instituições públicas e privadas adotaram estratégias didáticas pedagógicas em virtude da ampla disseminação da COVID-19, visando oferecer maior suporte acadêmico aos discentes devido às medidas de isolamento exigidas pelos agentes governamentais, gerando mudanças no ambiente de estudo convencional, para não comprometer o aprendizado dos estudantes de ensino superior. Entre os principais problemas apontados pelos discentes que avaliaram a modalidade remota, destaca-se o comprometimento da concentração, a dificuldade de aprendizado bem como a ausência de ambiente propício para a dedicação acadêmica. Contudo, verifica-se que o estado pandêmico proporcionou modificações em instituições de ensino superior, inclusive o surgimento de novas problemáticas, como a ausência de autonomia em estudantes no aspecto de aprendizagem e a

necessidade de construir metodologias destinadas a engajar o aluno, viabilizando a continuidade do processo pedagógico.

Palavras-chave: Aprendizado; Discentes; Instituições; Pandemia.

Resumen

Considerando las adaptaciones en el ámbito educativo realizadas a raíz de la condición de pandemia asociada al microorganismo SARS-CoV-2, este trabajo tiene como objetivo evaluar el impacto de la modalidad a distancia en las instituciones de educación superior durante el actual período de pandemia. Por ello, se realizó una revisión sistemática de la literatura, asociada a criterios de exclusión que incluyen tesis, disertaciones o trabajos publicados en anales y bases de datos como PubMed. Varias instituciones públicas y privadas han adoptado estrategias didácticas pedagógicas debido a la gran propagación del COVID-19, con el objetivo de brindar un mayor apoyo académico a los estudiantes debido a las medidas de aislamiento exigidas por los agentes gubernamentales, generando cambios en el ambiente de estudio convencional, para no comprometer el aprendizaje de los estudiantes de educación superior. Entre los principales problemas señalados por los estudiantes que evaluaron la modalidad a distancia, se encuentra el deterioro de la concentración, dificultades de aprendizaje, así como la ausencia de un ambiente propicio para la dedicación académica. Sin embargo, parece que el estado de pandemia ha traído cambios en las instituciones de educación superior, incluyendo el surgimiento de nuevos problemas como la falta de autonomía de los estudiantes en el aspecto de aprendizaje y la necesidad de construir metodologías dirigidas a involucrar al estudiante, posibilitando la continuidad del proceso pedagógico.

Palabras clave: Aprendizaje; Estudiantes; Instituciones; Pandemia.

1. Introduction

Due to the pandemic scenario triggered by the SARS-CoV-2 pathogen, which began in March 2020, it was necessary to cancel the face-to-face teaching modality in private and public sectors, causing several changes, associated with the educational methodologies approached, which, perhaps, also provided consequences at the higher education level, mainly, directed to the learning aspect (Silva et al., 2020). Therefore, the emergence of the infectious disease, called COVID-19, made it impossible to continue educational practice at the university level temporarily (Barberio et al., 2020).

The university centers have used the remote or hybrid teaching models, rearranging methodologies, communication technology infrastructure, or information to offer online learning, based on the summary of the opinion of the National Board of Education that presented National Guidelines, aiming at the implementation of remote teaching allied to the educational trends of the 21st century and the isolation assignments required by government agents, as a preventive measure against the disease caused by the new coronavirus (COVID-19), with high pathogenicity (Desai et al, 2020; Gusso et al., 2020; Sousa et al., 2020).

To promote the continuity of the educational practice, despite the restrictions of physical distance, modifications have occurred in the teaching plan of universities, mainly directed to the adhesion of virtual tools such as Microsoft Teams. Digital resources make it possible to establish theoretical and practical knowledge, as well as the workload required for each subject, and check the academic performance of students (Samarrae, 2020; Kalanlar, 2022).

According to Castioni et al. (2021), several Brazilian higher education units carried out the introduction of the school year but later suggested the impossibility of continuity due to restrictive conditions, such as the absence of computers or digital knowledge and the cancellation of the educational process was temporarily affected. However, other countries, such as the United States or Europe, have succeeded in applying remote alternatives verifiably.

According to Hilburg et al. (2020), the physical withdrawal strategies imposed globally have increased the rates of stress and various psychological disorders. Therefore, telehealth is the resource that enables the evaluation of patients virtually, even in pandemic periods, contributing to the educational process.

According to Quintiliani et al. (2021), social isolation practices have intensified the development of various psychological changes, such as excessive fear, delusional conditions, or those resulting from recurrent stressors. However, undergraduates in various health fields, such as nursing, medicine, or physiotherapy, living in Italy, presented reduced quality

of life and productivity for academic activities as a result of the pandemic event.

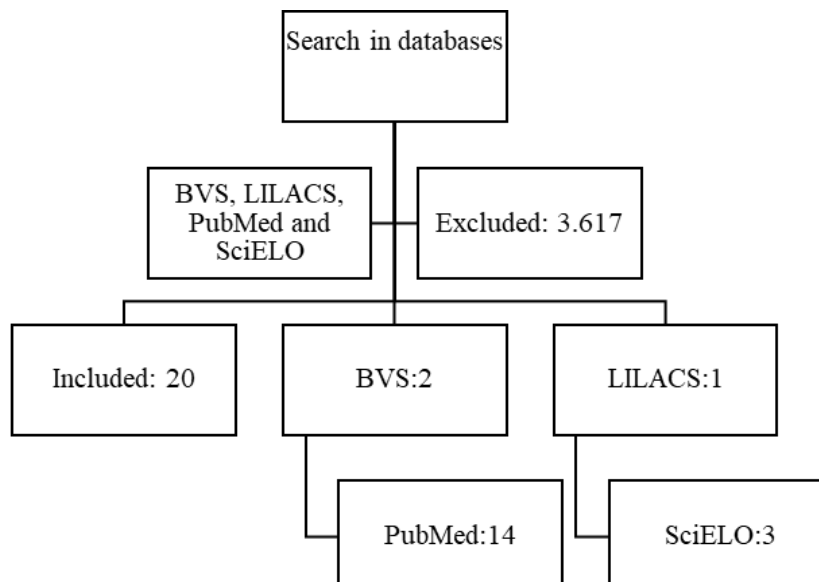
A study conducted in Chile, in 2021, with dental students, found that platforms used in higher education represent virtual tools with limitations since learners with no internet or adequate electronic devices have limited accessibility to disciplinary content provided by teachers. Consequently, the scarcity of technological resources makes it impossible to acquire knowledge through digital parameters (Roco-Bazález, 2021). In the meantime, the present work aims to evaluate the impact of a remote teaching in higher education institutions during the pandemic period, caused by the new coronavirus.

2. Methodology

According to Roever (2020), the systematic literature review goes through stages to explore, select, analyze, compile, or describe the scientific data available in studies with several methodologies related to a certain guiding question. Among the characteristics of this modality, the high reproducibility stands out. Therefore, a systematic literature review was carried out utilizing articles that aim to analyze the relationship of the impact of the pandemic caused by the viral agent SARS-CoV-2 in higher education during July 2022. The descriptors employed by means of the Boolean operator "And" consist of: Education Distance, Coronavirus Infections, COVID-19, Educación a Distancia, Infecciones por Coronavirus, Coronavirus Infections and Distance Education.

The eligibility parameters are based on articles in English, Spanish, or Portuguese, in the time frame between 2020 and 2022. The exclusion aspects used were theses, dissertations, and papers published in proceedings. The selection of scientific works occurred through the analysis of title, abstract, methodology and results of articles. The databases used for the search included Biblioteca Virtual em Saúde Brasil (BVS), Literatura Latino-americana e do Caribe em Ciências da Saúde (LILACS), PubMed, and Scientific Electronic Library (SciELO), where 20 articles were selected, as shown in Figure 1.

Figure 1 - Represents the total number of articles defined by applying the search method.



Source: Own authorship (2022).

3. Results and Discussion

In the twenty articles included in this study, there are different methodologies corresponding to cross-sectional studies, experience reports, and randomized studies, as shown in Table 1. Regarding the distribution of the evaluated countries, Saudi Arabia, Brazil, Chile, South Korea, Egypt, United States, Indonesia, Jordan, Libya, and Turkey stand out.

Table 1 - Presents the main constraints of remote teaching and designated suggestions for improvement.

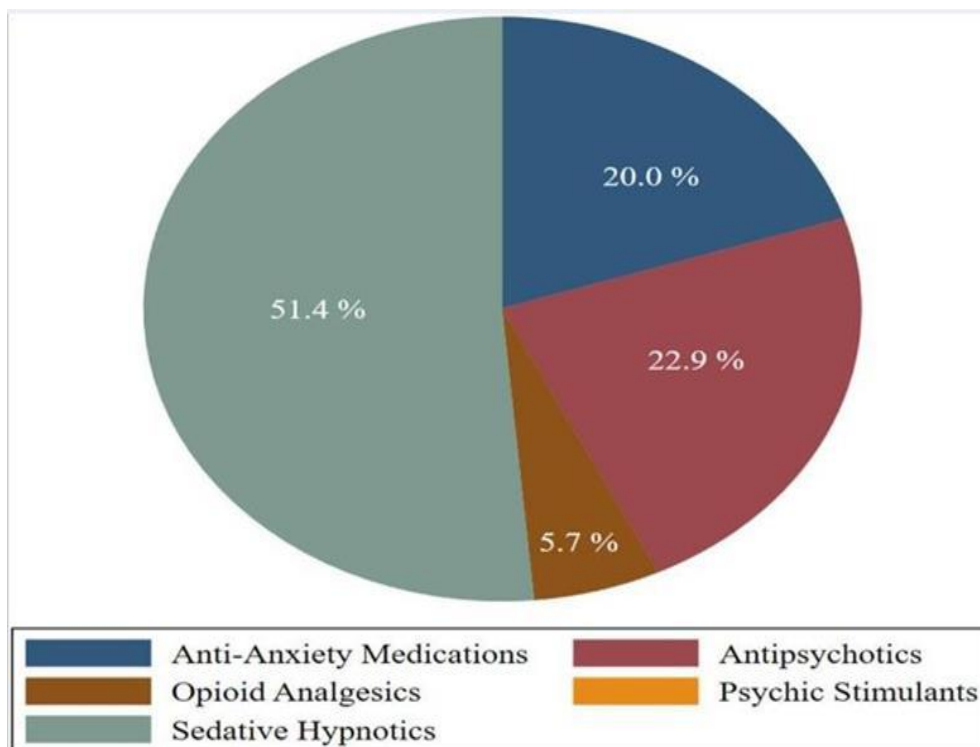
Author	Year	Title	Conclusion
Alsoufi et al.	2020	Impact of the COVID-19 pandemic on medical education: medical students' knowledge, attitudes, and practices about e-learning.	The limitation of the consequences of the current pandemic on the teaching of medical students is effected through assignments referred to as appropriate, as the implementation of active methods aimed at learning.
Dost et al.	2020	Medical students' perceptions of online teaching during the COVID-19 pandemic: a national cross-sectional survey of 2721 UK medical students.	Remote education is characterized as effective, however, introducing adaptations such as the use of active methodologies though programs the specifics enhance the academic training of apprentices.
Singal et al.	2021	Anatomy education of medical and dental students during the COVID-19 pandemic: a reality check.	Remote teaching represents a favorable option for the pandemic's advent; however, it requires improvements based on educators' demands.
Araújo et al.	2021	The remote work of teaching nurses in times of pandemic.	The emergent educational environment has provided several assignments that have contributed to the emergence of illnesses in students; therefore, the educators' craft needs adaptations.
Moreira et al.	2021	Academic experience in an extension project in times of pandemic.	The emergency modality adhered to in university centers includes YouTube or Moodle. Therefore, the change in the teaching model is considered relevant because of the preventive, due to the magnitude of the pandemic.
Santos et al.	2021	Transitioning from face-to-face to remote teaching in COVID-19 times: faculty perspective.	The online academic environment comprises an alternative that requires adjustments, directed to the expansion of the technical improvement for use of technological resources.
Silva et al.	2021	Remote education in the training continuum medical in times of pandemic: feasibility and perceptions.	Remote teaching covers deficiencies such as restricted availability associated with students without technological resources.
Valdés and Valenzuela	2021	The college experience of free tuition students in the context of the COVID-19 pandemic.	The introduction of virtual academic education has come about through adversity, as it requires the presence of electronic devices and skills directed toward digital knowledge.

Source: Own authorship (2022).

Academic training through remote learning contributes to the prevention of infectious diseases. The online educational methodology, taught in several universities, became effective through technological progress, aiming at the exposure of disciplinary contents with flexibility and restriction of the risks of spreading COVID-19 (Araújo et al., 2021; Silva et al., 2021; Valdés & Valenzuela, 2021).

According to Alsoufi et al. (2020), undergraduate medical students in Libya have digital skills, but the extent of the pandemic state promoted changes in the psychological health and damage to the learning process of university students, whose main ailments consisted of depression or exacerbated anxiety. According to Akour et al. (2020), teachers of higher education institutions also originated psychological consequences, because they adhered to therapeutic interventions, with sedation properties due to successful adversities, as seen in Figure 2, which explains the administration of drugs designated as neuroleptics or intended to reduce the anxious state.

Figure 2 - Presents the main pharmacological compounds adhered to by Jordanian educators.



Source: Akour et al. (2020).

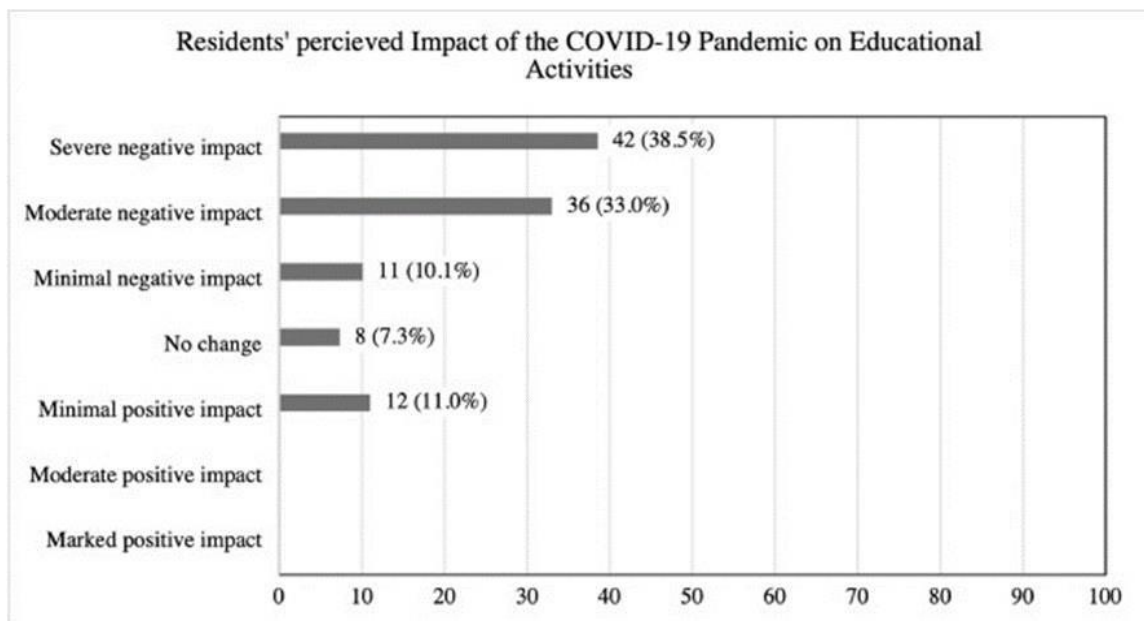
Among the limitations of the emergency teaching method, the absence of practical activities that stimulates the autonomous learning process stands out. The cancellation of face-to-face methods corresponds to the alternative intended to prevent overcrowding in health systems. However, the classes recorded using recordings provide access to academic collections, through the availability of the internet. Virtual tools used in the educational field consist of videoconferencing platforms such as Google Meet and Zoom (Moreira et al., 2021; Singal et al., 2021).

Mandatory supervised internships usually aim at the execution of practical assignments, aiming at the development of students' professional competencies; however, due to the pandemic state, virtual laboratories have been adopted as a teaching method (Santos et al., 2021). According to Dost et al. (2020), undergraduate medical students in the United Kingdom characterized emergency education as flexible and cost-effective.

According to Nepal et al. (2020), medical students at a university in Nepal often use cell phones as electronic devices during remote learning. Therefore, the quality of face-to-face teaching stands out as effective, as the remote and hybrid modality makes it possible to reduce academic performance.

A study developed by Pasricha et al. (2020) evaluated the effectiveness of the virtual laboratory aimed at the instruction of clinical procedures such as surgeries for ophthalmology students, explaining it as a competent resource of affordable or adequate implementation due to the pandemic state. According to Alhasan et al. (2021), radiologists integrating the specialization program located in Saudi Arabia analyzed the effects coming from the pandemic in the educational sphere and characterized the associated consequences, referred to in Figure 3, which resulted in high rates of dissatisfaction of university students.

Figure 3 - Presents the students' perspectives regarding the remote modality, evidenced as inadequate.



Source: Alhasan et al. (2021).

Bastos et al. (2020) explain that nursing professors in Brazil employed didactic musical strategies when students were free of motivation and acquired skills in handling virtual parameters such as the Big Blue Button, aiming at the execution of the emergency learning modality. However, undergraduate dental students in Indonesia showed a predilection for face-to-face teaching (Amir et al., 2020).

According to Natarajan and Joseph (2022), the teachers initially demanded the improvement of pedagogical planning aimed at the sudden transition of the teaching modality. Therefore, remote education enables interaction of students and favors the establishment of curricular content through technological parameters or active methodologies, although the adaptive process in managing virtual platforms requires technical foundations.

A study conducted in Saudi Arabia by Khalil et al. (2020) found that medical universities adopted pedagogical models associated with active learning strategies. However, the acquisition of knowledge through remote educational practices contributes to the safety of students, since they integrate the exposure of stored digital content, simultaneous transmission of classes, or only auditory resources, enabling communication between teacher and learner.

According to Kim et al. (2022), the inclusion of the remote educational environment is a complex task, as it differs from the traditional teaching model. The sudden replacement in colleges, from face-to-face to virtual modality, required several adjustments. Therefore, the professors characterized the emergency educational environment as satisfactory, when technical improvement takes place, aiming at the execution of the educational method. However, the academics reported discreditability associated with remote teaching, as reimbursement was requested in financial sectors.

According to Hassan et al. (2022), dental undergraduates from universities located in Egypt analyzed the aspects associated with digital teaching and approved the establishment of measures such as conducting remote scientific sessions. However, the implemented technological resources obtained a quality deficit. COVID-19 triggered consequences in the improvement of the dental practice, compromising the academic development of students.

The medical schools in Brazil provided accessibility to conferences through online tools, meetings linked to debates, and recreational activities, as well as availability to bibliographies and studies located in journals or periodicals, aiming at the development of theoretical aspects of students. The pedagogical alternatives contributed to enhancing student performance

since they enable the registration of disciplinary contents or sharing (Rodrigues et al., 2022).

A study performed by Cengiz et al. (2022) explains that the students, in face of the pandemic situation, presented several adverse factors such as sleep disorders, suspension of scientific demands, and limitations in the execution of technical procedures. Therefore, the impairment of the development of skills necessary for the labor market requires institutional measures directed to the adherence of new didactic strategies in the remote educational environment.

According to Akour et al. (2020), the faculty members of the higher education unit, located in Jordan, taught the subjects with a remote approach and showed apprehension toward the pedagogical proposals due to the feasibility of illicit conduct in the execution of the academic tests, as it compromises the development of the desired performance in students. The establishment of the educational environment occurred through Skype or Youtube, as expressed in Table 2.

Table 2 - Displays the virtual resources used in the online learning process.

Program	Frequency (n)	Percentage
Moodle	213	55.8
Zoom	198	51.8
Microsoft Teams	191	50.0
Facebook/Facebook Messenger	164	42.9
WhatsApp Messenger	144	37.7
YouTube	53	13.9
Google Classrooms	34	8.9
Skype	16	4.2
Blackboard	12	3.1
Webex	6	1.6
Canvas	2	0.5
D2L (desire to learn)	1	0.3

Source: Akour et al. (2020).

Table 3 demonstrates the main technological parameters employed in emergency academic training, such as Moodle (Modular Object-Oriented Dynamic Learning Environment), Zoom, and Microsoft Teams.

4. Conclusion

The pandemic originated by the SARS-CoV-2 microorganism affected the learning acquisition of several students, mainly in the health area, due to the difficulty of connectivity in virtual platforms and limited or scarce internet access. The academics' networking was compromised, causing the restriction of interaction between students and teachers. However, the benefits of the online modality are also highlighted, such as the stimulation of the autonomous learning process or the induction of the development of skills associated with the use of technological means, including those aimed at the management of associated adversities. Given the above, there is a need for further investment in the development of new methodological tools to improve remote learning.

References

- Alhasan, A. S., Alahmadi, S. M., Altayeb, Y. A., & Daqqaq, T. S. (2021). Impact of COVID-19 Pandemic on Training and Well-Being in Radiology Residency: A National Survey of Diagnostic Radiology Trainees in Saudi Arabia. *Academic Radiology*, 1002-1009.
- Akour, A., Ala'a, B., Barakat, M., Kanj, R., Fakhouri, H. N., Malkawi, A., & Musleh, G. (2020). The impact of the COVID-19 pandemic and emergency distance teaching on the psychological status of university teachers: a cross-sectional study in Jordan. *The American Journal of Tropical Medicine and Hygiene*, 103(6), 2391–2399.
- Amir, L. R., Tanti, I., Maharani, D. A., Wimardhani, Y. S., Julia, V., Sulijaya, B., & Puspitawati, R. (2020). Student perspective of classroom and distance learning during COVID-19 pandemic in the undergraduate dental study program Universitas Indonesia. *BMC Medical Education*, 20(1), 1–8.
- Araújo, A. R. L., Sousa, L. M. C., Carvalho, R. B. de S., Oliveira, A. D. da S., Amorim, F. C. M., Sousa, K. H. J. F., Zeitoune, R. C. G., & Damasceno, C. K. C. S. (2021). O trabalho remoto de enfermeiros docentes em tempos de pandemia. *Escola Anna Nery*, 1-9.
- Alsoufi, A., Alsuyhili, A., Msherghi, A., Elhadi, A., Atiyah, H., Ashini, A., Ashwieb, A., Ghula, M., ben Hasan, H., & Abudabuos, S. (2020). Impact of the COVID-19 pandemic on medical education: Medical students' knowledge, attitudes, and practices regarding electronic learning. *PloS One*, 15(11), 1-20.
- Barberio, B., Massimi, D., Dipace, A., Zingone, F., Farinati, F., & Savarino, E. v. (2020). Medical and gastroenterological education during the COVID-19 outbreak. *Nature Reviews Gastroenterology & Hepatology*, 17(8), 447–449.
- Bastos, M. de C., Canavaro, D. de A., Campos, L. M., Schulz, R. da S., Santos, J. B. dos, & Santos, C. F. dos. (2020). Ensino remoto emergencial na graduação em enfermagem: relato de experiência na covid-19. *Revista Mineira de Enfermagem*, 1–6.
- Castioni, R., Melo, A. A. S. de, Nascimento, P. M., & Ramos, D. L. (2021). Universidades federais en la pandemia de Covid-19: acceso a internet para estudiantes y Educación remota de emergencia. *Ensaio: Avaliação e Políticas Públicas Em Educação*, 29(111), 399–419.
- Cengiz, Z., Gurdap, Z., & Işık, K. (2022). Challenges experienced by nursing students during the COVID-19 pandemic. *Perspectives in Psychiatric Care*, 47-53.
- Desai, D., Sen, S., Desai, S., Desai, R., & Dash, S. (2020). Assessment of online teaching as an adjunct to medical education in the backdrop of COVID-19 lockdown in a developing country—An online survey. *Indian Journal of Ophthalmology*, 68(11), 2399-2403.
- Dost, S., Hossain, A., Shehab, M., Abdelwahed, A., & Al-Nusair, L. (2020). Perceptions of medical students towards online teaching during the COVID-19 pandemic: a national cross-sectional survey of 2721 UK medical students. *BMJ Open*, 10(11), 1-10.
- Gusso, H. L., Archer, A. B., Luiz, F. B., Sãhã, F. T., Luca, G. G. de, Henklain, M. H. O., Panosso, M. G., Kienen, N., Beltramello, O., & Gonçalves, V. M. (2020). Ensino superior em tempos de pandemia: diretrizes à gestão universitária. *Educação & Sociedade*, 1-27.
- Hassan, R., Khalifa, A. R., Elsewify, T., & Hassan, M. G. (2022). Perceptions of Clinical Dental Students Toward Online Education During the COVID-19 Crisis: An Egyptian Multicenter Cross-Sectional Survey. *Frontiers in Psychology*, 12, 1-11.
- Hilburg, R., Patel, N., Ambruso, S., Biewald, M. A., & Farouk, S. S. (2020). Medical education during the coronavirus disease-2019 pandemic: learning from a distance. *Advances in Chronic Kidney Disease*, 27(5), 412–417.
- Kalanlar, B. (2022). Nursing education in the pandemic: A cross-sectional international study. *Nurse education today*, 1-6.
- Khalil, R., Mansour, A. E., Fadda, W. A., Almisnid, K., Aldamegh, M., Al-Nafeesah, A., Alkhalifah, A., & Al-Wutayd, O. (2020). The sudden transition to synchronized online learning during the COVID-19 pandemic in Saudi Arabia: a qualitative study exploring medical students' perspectives. *BMC Medical Education*, 20(1), 1–10.
- Kim, S., Jeong, S. H., Kim, H. S., & Jeong, Y. J. (2022). Academic Success of Online Learning in Undergraduate Nursing Education Programs in the COVID-19 Pandemic Era. *Journal of Professional Nursing*, 38, 6–16.
- Moreira, R. C., Santos, C. S., de Freitas Gomes, M. A., Freitas, L. C. D., & Andrade, S. N. (2021). Vivência acadêmica em um projeto de extensão em tempos de pandemia. *Revista de APS*, 24(4).
- Natarajan, J., & Joseph, M. A. (2022). Impact of emergency remote teaching on nursing students' engagement, social presence, and satisfaction during the COVID-19 pandemic. *Nursing Forum*, 42-48.
- Nepal, S., Atreya, A., Menezes, R. G., & Joshi, R. R. (2020). Students' perspective on online medical education amidst the COVID-19 pandemic in Nepal. *Journal of Nepal Health Research Council*, 551-555.
- Pasricha, N. D., Haq, Z., Ahmad, T. R., Chan, L., Redd, T. K., Seitzman, G. D., Parikh, N., Kim, T. N., Schallhorn, J. M., & Ramanathan, S. (2020). Remote corneal suturing wet lab: microsurgical education during the COVID-19 pandemic. *Journal of Cataract and Refractive Surgery*, 1-7.
- Quintiliani, L., Sisto, A., Vicinanza, F., Curcio, G., & Tambone, V. (2021). Resilience and psychological impact on Italian university students during COVID-19 pandemic. Distance learning and health. *Psychology, Health & Medicine*, 1–12.
- Roco-Bazález, J. A. (2021). Impacto de la Pandemia por COVID-19 (SARS-CoV 2) en la Educación Odontológica: Scoping Review. *International Journal of Odontostomatology*, 15(1), 10–13.
- Rodrigues, M. A. M., Zornoff, D., & Kobayasi, R. (2022). Remote Pathology teaching under the COVID-19 pandemic: Medical students' perceptions. *Annals of Diagnostic Pathology*, 56, 1-4.
- Roeber, L. (2020). *Guia Prático de Revisão Sistemática e Metanálise*.

Samarasee, A. al. (2020). The impact of the COVID-19 pandemic on medical education. *British Journal of Hospital Medicine*, 1-4.

Santos, L. L. dos, Nery, N. de M. L., Carvalho, E. R. de, & Cecilio-Fernandes, D. (2021). Transição do ensino presencial para o remoto em tempos de COVID-19: perspectiva docente. *Scientia Medica*, 1-8.

Silva, A. W. C., Cunha, A. A., Alves, G. C., Corona, R. A., de Mattos Dias, C. A. G., Nassiri, R., Vedovelli, S., de Araújo, M. H. M., da Souza, K. O., & de Oliveira, E. (2020). Caracterização clínica e epidemiologia de 1560 casos de COVID-19 em Macapá/AP, extremo norte do Brasil. *Research, Society and Development*, 9(8).

Silva, P. H. dos S., Faustino, L. R., Oliveira, M. S. de, & Silva, F. B. F. (2021). Educação remota na continuidade da formação médica em tempos de pandemia: viabilidade e percepções. *Revista Brasileira de Educação Médica*, 1-12.

Singal, A., Bansal, A., Chaudhary, P., Singh, H., & Patra, A. (2021). Anatomy education of medical and dental students during COVID-19 pandemic: a reality check. *Surgical and Radiologic Anatomy*, 43(4), 515–521.

Sousa, G. O., Sales, B. N., Rodrigues, A. M. X., de Moura Rocha, G. M., & de Oliveira, G. A. L. (2020). Evolução epidemiológica da COVID-19 no Brasil e no mundo. *Research, Society and Development*, 9(7).

Valdés Á., C., & Valenzuela S., L. (2021). La experiencia universitaria de estudiantes con gratuidad en contexto de pandemia Covid-19. *Ultima Década*, 29(56), 176–212.