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Transitioning from Remote to In-Person Learning: Medical Students' Perspectives after the COVID-19 Pandemic

Transição do ensino remoto para o presencial: perspectivas de estudantes de medicina após a pandemia de COVID-19

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ABSTRACT

Introduction: The return to post-pandemic in-person teaching in Brazilian medical schools required adjustments on the part of students and teachers, to readjust to the traditional teaching model after the remote regime was implemented.

Objective: This study determined, from the student's perspective, the post-pandemic pedagogical strategies, challenges during the transition period, benefits of returning to in-person learning, faculty performance in this context, and recommendations for post-pandemic in-person medical education in a public university in Rio Grande do Norte, Brazil.

Method: Both quantitative and qualitative approaches were employed for data collection and analysis. The research involved 185 medicine students, and their responses were gathered between November 2022 and May 2023.

Result: According to the data, the use of information and communication technologies (ICTs) persisted in in-person education. The main challenges encompass increased expenses, uncertainty regarding learning, and fatigue. Nevertheless, students valued interactivity, motivation, and the opportunity to clarify doubts with instructors during in-person classes. Emphasis was placed on the need for dynamic classes, the adoption of a hybrid teaching approach, and the ubiquitous use of technology in medical education. Additionally, the importance of schedule organization, assessment diversification, and investment in instructors and infrastructure is highlighted.

Conclusion: In summary, the study reveals that key remote teaching strategies, such as online platforms and asynchronous access to resources, seamlessly transitioned into in-person education. However, challenges such as financial burdens and adapting to the in-person format were notable. Despite this, students emphasized the benefits of increased engagement and improved learning outcomes, underscoring the importance of maintaining a dynamic and adaptive approach to post-pandemic education.

Keywords: Medical Education; Covid-19 pandemic; Medical students; Faculty; Information and communication technology.

RESUMO

Introdução: *O retorno ao ensino presencial pós-pandemia nas escolas médicas brasileiras careceu de adequações por parte de estudantes e professores, no sentido de eles se reajustarem ao modelo de ensino tradicional após o regime remoto implantado.*

Objetivo: *Este estudo determinou, sob a perspectiva dos estudantes, as principais estratégias pedagógicas pós-pandêmicas utilizadas, os desafios durante o período de transição, os benefícios do retorno ao presencial, o desempenho docente nesse contexto e as recomendações para a educação médica presencial pós-pandemia em uma universidade pública no Rio Grande do Norte, no Brasil. Método: Abordagens quantitativas e qualitativas foram utilizadas para coleta e análise de dados. A pesquisa envolveu 185 estudantes de Medicina, e suas respostas foram coletadas entre novembro de 2022 e maio de 2023.*

Resultado: *De acordo com os dados, o uso de tecnologias de informação e comunicação (TIC) persistiu no ensino presencial. Os principais desafios incluíram aumento de despesas, incerteza em relação ao aprendizado e fadiga. No entanto, os estudantes valorizaram a interatividade, a motivação e a oportunidade de esclarecer dúvidas com os instrutores durante as aulas presenciais. Destacaram-se a necessidade de aulas dinâmicas, a adoção de uma abordagem de ensino híbrido e o uso ubíquo de tecnologia no ensino médico. Além disso, sobressaíram a importância da organização de horários, a diversificação das avaliações e o investimento em instrutores e infraestrutura.*

Conclusão: *O estudo revela que as estratégias-chave de ensino remoto, como plataformas online e acesso assíncrono a recursos, integraram-se facilmente à educação presencial. No entanto, desafios como encargos financeiros e adaptação ao formato presencial foram notáveis. Apesar disso, os alunos enfatizaram os benefícios do aumento do engajamento e os melhores resultados de aprendizagem, destacando a importância de manter uma abordagem dinâmica e adaptativa à educação pós-pandêmica.*

Palavras-chave: *Educação Médica; Pandemia por Covid-19; Estudantes de Medicina; Corpo Docente; Tecnologia da Informação e Comunicação.*

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INTRODUCTION

The return to in-person education unfolded as a natural progression following the stabilization of COVID-19 in Brazil[1]. Medical education provided at the higher education institution investigated, which had been conducted remotely, has almost entirely resumed in-person activities, with only a few hybrid or distance learning initiatives on the campus.

After the pandemic, the experience gained in teaching strategies suggests the possibility of using face-to-face meetings, fully online classes, and blended learning approaches[2]. Understanding how the return to in-person activities will unfold after the pandemic is an important area of analysis, as research suggests that both medical students and teachers prefer adopting a hybrid teaching model[3].

The understanding and interpretations of the (re) adaptation to the previously practiced in-person teaching become apparent, especially from a student's perspective.

This study aimed to assess the transition from remote to in-person education at the Faculty of Medicine at a university in Rio Grande do Norte, from the student's perspective. The key post-pandemic pedagogical strategies that persisted even upon the resumption of in-person activities, the primary challenges encountered by students during the transitional phase, the benefits they associate with returning to face-to-face learning, the assessment of teaching performance by the student body within this context, and provided recommendations for post-pandemic, in-person medical education were identified.

METHOD

The study employed a mixed-method approach, incorporating quantitative methods and an analysis of discursive responses given by students. The research was conducted within the Faculty of Medicine in a public university situated in the northeastern region of Brazil. The medicine course analyzed was established in 2004 and holds accreditation from both the Brazilian Ministry of Education and the State Council of Education of Rio Grande do Norte. It is affiliated with a public university, with an annual authorization of 60 new vacancies, evenly distributed across two semesters.

The course mainly follows traditional teaching methods, with an emphasis on teacher-centered techniques. Nevertheless, some teachers are taking the initiative to incorporate active teaching methods and utilize technology in their classes. As for the students, the sample included those with an active connection to the university, aged at least 18, and willing to respond to data collection instruments through remote tools. The exclusion criteria consisted of students enrolled in the first and second semesters of the program, who had not been exposed to remote instruction within the institution at the time, and respondents providing incomplete or inaccurate survey responses. The minimum sample size was determined to be 177 responses using the sample size calculation formula, considering the finite eligible population of 257 students, and incorporating a 15% allowance for potential loss. Data collection and analysis methods adhered to previously described protocols[4].

The quantitative data underwent descriptive analysis. The qualitative data were coded, categorized, and analyzed using content analysis to assess responses from research participants. Remote data collection was carried out by utilizing the Google Forms platform to distribute questionnaires to the research participants. The instrument included items with multiple-choice questions in the investigation phase regarding the advantages and disadvantages of returning to in-person teaching. Opinions about the teachers' performance after the pandemic were gathered using Likert-scale questions. Responses to open-ended questions focused on the students' suggestions and recommendations for the smooth operation of the medicine course after the return to in-person classes.

The research obtained approval from the Ethics Committee on Research at the University of the State of Rio Grande do Norte before data collection. The approval protocol, CAAE: 39196220.3.0000.5294, bears the number 4.357.461.

RESULTS

Study participants

A total of 185 responses from students (comprising 72% of the target population) were collected, encompassing students from the 3rd to the 12th academic periods, with an average age of 25 years. Data collection occurred between November 2022 and May 2023. Among the participants, 50.3% had experienced in-person classes before the pandemic, while 49.7% commenced their studies during the pandemic period.

Teaching and learning strategies that persisted after the resumption of in-person classes

The primary teaching and learning strategies adopted during remote education that successfully continued during the in-person regime included the use of online platforms for student communication and pedagogical organization of curricular components, asynchronous access to audiovisual resources, as well as occasional remote teaching episodes. Detailed descriptions of these strategies can be found in Table 1.

Challenges and difficulties inherent to the resumption of in-person classes

Concerning the main challenges and obstacles associated with the return to in-person classes (refer to

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Graphic 1), the following were observed: increased financial burdens (47%), students perceiving their knowledge levels as falling short of expectations (46.5%), issues related to fatigue and burnout (44.9%), struggles in adapting to the in-person format (38.9%), and the emergence or worsening of psychological disorders (25.9%).

Benefits of returning to in-person education

Regarding the key advantages associated with the transition to in-person education, students predominantly highlighted finding classes more engaging (65.9%), achieving heightened concentration and focus (49.7%), enhanced learning outcomes (47.6%), increased motivation for studying (47%), and improved accessibility for seeking clarification from instructors (46.5%) (refer to Graphic 2).

Perceptions of teaching performance upon returning to in-person instruction

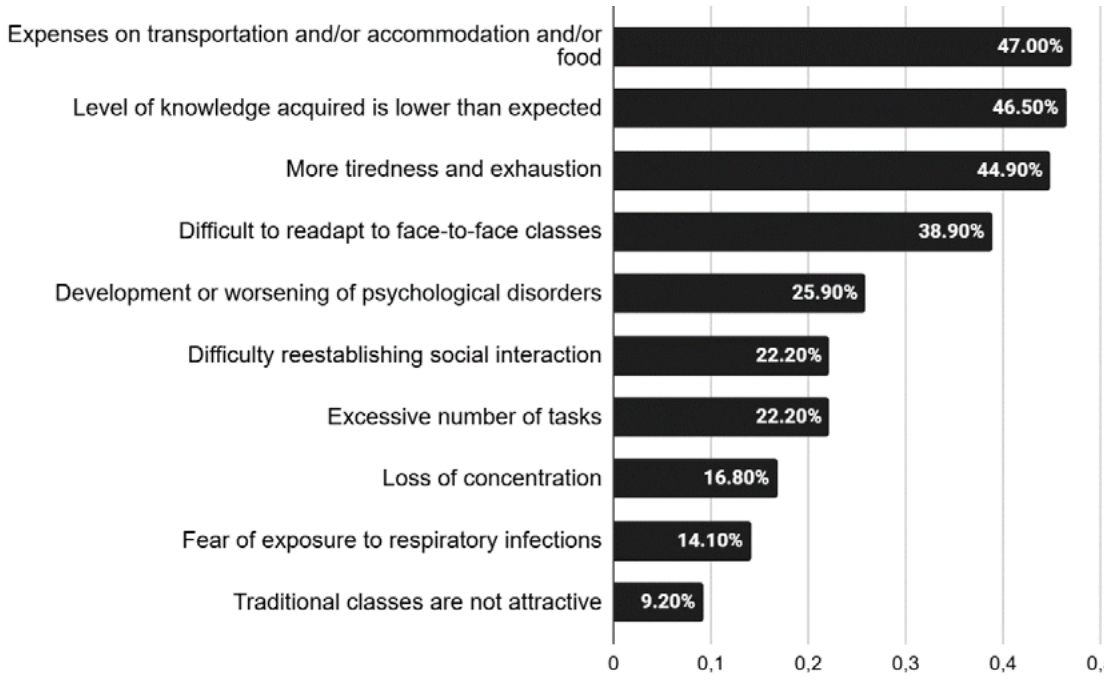
Among the statements that received partial or full disagreement from students, almost 80% disagreed with the obsolescence of the teacher's presence in the post-pandemic era. A total of 49.7% disagreed that there was no difference in the teacher's dynamics or teaching style upon the return to in-person classes, and 51.9% disagreed that the

Table 1. Teaching-learning strategies that remained after the return in person from the students' perspective.

Successfully maintained strategies	Percentage of students who agreed with the statement
Use of a "Google Classroom" style platform to carry out activities and share materials	72.40%
Instant messaging group with teachers and students to answer questions	48.60%
Recorded classes for students to review subjects later	43.80%
Use of social networks, such as Instagram and YouTube	38.90%
Some remote and live classes not requiring physical presence	34.10%
Creation of audiovisual materials as a learning and/or assessment strategy.	25.40%
Use of games and quizzes	22.20%
Teachers allow assessments to be carried out remotely	21.60%
Classes are more dynamic, objective, and contextualized	14.60%
Being able to consult materials at the time of assessment	5.40%

Source: Prepared by the authors.

Graphic 1. Challenges and difficulties of returning to in-person classes, according to medical students.



Source: Prepared by the authors.

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teacher became stricter and less open to suggestions after the return to in-person teaching. In terms of statements that received partial or full agreement from students, 50.2% of the students agreed that the teacher started using digital technologies more easily, 42.7% agreed that the teacher neither got worse nor improved with the experience of remote teaching, and 54.6% agreed that the teacher did not take advantage of remote teaching to modernize their classes (refer to Figure 1).

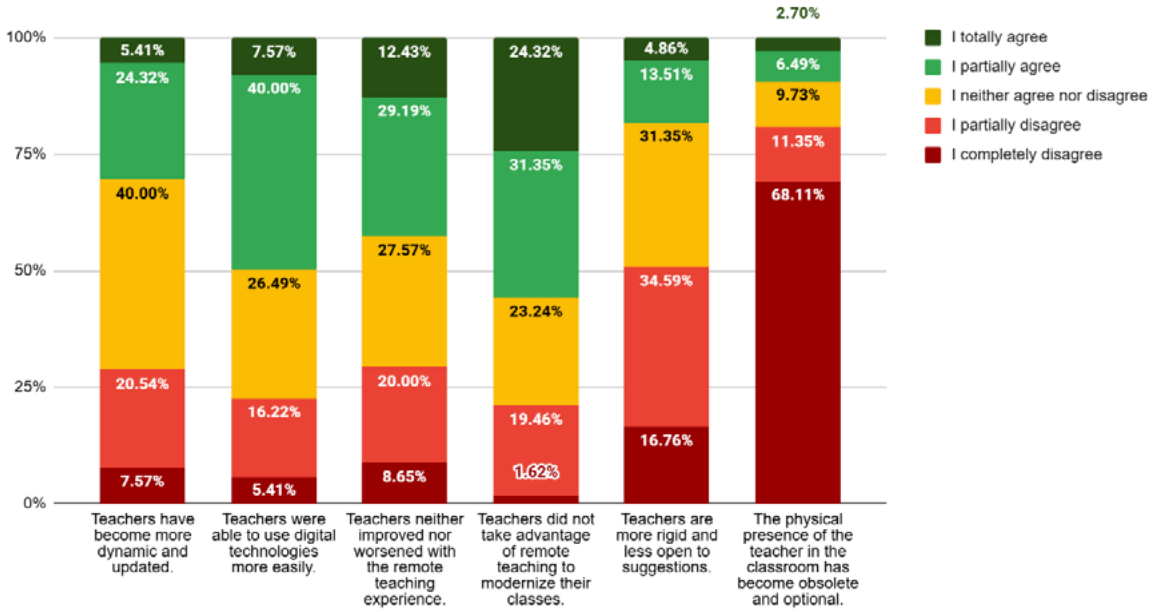
Analysis of content from open-ended responses

Of the 185 responding students, 78 answered the open-ended question inquiring about suggestions for improving medical education after the return to in-person instruction. The key recommendations derived from the responses, following coding and categorization, are depicted in Box 1. Notably, students expressed a desire for more interactive and dynamic lessons and advocated for the implementation of a hybrid approach to teaching and learning upon the resumption of normal campus activities.

Graphic 2. Benefits arising from returning to in-person teaching, according to medical students.

Source: Prepared by the authors.

Figure 3. Students' perception of the performance of medical teachers in post-pandemic classes.



Source: Prepared by the authors.

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Box 1. Students' recommendations to improve in-person medical education.

Central topic	Subtopic	N*
Pro-pedagogical initiatives to improve the learning process	Carrying out more dynamic, interactive and updated classes	31
	Major planning and performance of practical classes	13
	Rethinking the need for remote classes	5
	Promotion of extracurricular activities	2
	Teaching aimed at internship	1
Integration of successful remote teaching practices into the curriculum	Continuing the course by implementing hybrid teaching	14
	Recording classes and making them available	7
	Use of ICTs and digital teaching platforms for pedagogical organization	6
Organization of the hours offered and curriculum improvement	Compliance with established deadlines and schedules	7
	Review of excessive workload arranged in each period	7
	Readjustment of the schedule to make it more comprehensive for learning	5
	Review of essential points to be taught	2
	Reevaluate the delay in subjects in the clinical cycle	1
	Taking more frequent breaks between classes	1
Adjustment of assessment methods	Diversify assessment strategies	6
	Model assessments for the residence	1
Teacher availability	Hiring teachers	2
	Teachers available to answer questions	1
Material resources and university heritage	Acquisition of digital resources	2

*N represents the number of times the idea was detected in the participants' speech.
Source: Prepared by the authors.

DISCUSSION

According to the current research, it was observed that there were pedagogical strategies and tools adopted in the remote education context that remained successful even after the return to in-person learning. These included virtual learning environments like "Google Classroom," instant messaging applications, asynchronous class recording and sharing, social media, and occasional synchronous remote classes. It is evident that these pro-pedagogical tools are straightforward to implement and could have been applied to medical education even before the pandemic-driven shift to remote learning. This supports the argument that the pandemic acted as a catalyst for modernizing the traditional classroom setting[5].

Among the factors that hindered the adaptation to in-person learning, increased financial expenses stood out. This might be linked to the fact that a significant portion of the medical students come from various states across Brazil and, during the pandemic, returned to their hometowns. This reality aligns with a previous study[6], which identified different cost-related factors that challenged the cost-saving measures implemented during remote learning: transportation costs, food expenses, access to academic resources, as well as home maintenance costs in the city where the university is located.

Factors affecting the students' physical and psychological well-being, such as fatigue, exhaustion, and the development or exacerbation of psychological disorders, negatively influenced the adaptation to in-person learning. University students in the post-pandemic era experienced issues related to anxiety, depression, and insomnia. It is recommended that students participate in programs to manage sleep and anxiety-related conditions[7].

In addition to the adaptation challenges, students highlighted the main benefits associated with the return to in-person learning. The statement that declared in-person classes were more interesting than remote ones received the highest percentage of agreement. This viewpoint is in line with expectations, as it is supported by numerous studies in the field of medical education highlighting the importance of face-to-face interactions for medical students[8]. Moreover, the advancement of information and communication technologies (ICTs) and the global reach of the internet have made it possible to remotely engage in practical activities[9]. However, it is argued that for the comprehensive development of medical practices, healthcare professionals in training must be exposed to social experiences grounded in physical presence. Empathy and the ability to interact with patients are primary requirements for the practice of medicine[8] .

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Another positive aspect of returning to in-person classes is the improved concentration, attention, increased learning, and enhanced motivation for studying. In a post-pandemic scenario, students exhibit higher cognitive and emotional engagement, associated with curiosity, attention, interest, and optimism in their learning process[10].

Students also found it easier to solve doubts with their teachers during the post-pandemic period, which is another positive aspect pointed out by a significant portion of the students. A notable enhancement in traditional teaching methods after the pandemic, as reported by the students, was the personalized support offered by instructors[11].

Regarding the students' perceptions of the teaching staff in the post-pandemic period, certain aspects warrant discussion. Despite the teachers being capable of handling digital technologies in the classroom upon the return to in-person learning, they seemed not to leverage this expertise to modernize their teaching. According to students, there was no significant change in the way teachers conducted classes before the pandemic or after returning to in-person instruction. This poses a point of reflection since medical education has been evolving in recent decades to incorporate active learning methodologies, meaningful learning, and digital technologies into its curricula[12] . The reluctance of the teaching staff to actively implement these innovations despite experiencing them during the pandemic may be related to a certain resistance to more contemporary teaching models.

This resistance is observed when the teaching staff is unfamiliar with remote teaching methods or lacks digital equipment and software handling skills, as seen at the onset of remote teaching by some instructors[13]. Therefore, the observed absence of alterations or enhancements in teaching approaches by the assessed teachers reinforces the embracing of conventional and technical medical education, which no longer corresponds to the societal transformations resulting from the COVID-19 pandemic[14] .

Despite these signs of apparent dissatisfaction with the post-pandemic teaching performance, it is undeniable that the teacher's presence in the classroom is indispensable. Notably, 80% of students either partially or entirely disagree with the statement that the teacher's presence has become obsolete and optional. Despite the emergence of digital technologies in the educational realm, more recently exemplified by artificial intelligence (AI), research shows that most students regard the presence and involvement of teachers in the learning process as indispensable[15]. They believe that only the teacher can provide learning experiences that integrate the necessary socio-emotional skills and promote critical thinking for solving 21st-century problems.

In response to inquiries about potential enhancements in medical education after the pandemic, the most frequently mentioned topic pertained to the dynamism and interactivity of classes. This corresponds to the additional findings presented in this study, suggesting that classes are likely as (un)dynamic and interactive as they were before the pandemic, despite the significant transformation in the teaching and learning process during the period of remote instruction[16].

Another aspect of the suggested improvement in medical education was related to practical classes. According to the students, these practical classes should occur more frequently, be more immersive, and be better integrated with the theory taught in the classroom. This is an interesting suggestion, considering that the students reported that there were few or no practical sessions during the remote learning periods. Competency-based medical education, in which clinical and laboratory practices are essential, should be more strongly emphasized to ensure that these medical students do not miss out on learning opportunities that only "hands-on" methods can offer[17].

The incorporation of effective remote teaching practices into the traditional face-to-face approach was a topic of discussion. It was noted that some students suggested maintaining the medical program in a hybrid format. This is a practical initiative supported by scientific literature that highlights curriculum adjustments in medical education across various domains, including medical surgery internships[18] family and community medicine[19], military medicine and disaster education practices[20], and radiology internships[21], among numerous other adaptations.

Furthermore, students value the possibility of revisiting asynchronously recorded lectures and using different digital platforms and virtual learning environments that enable more technological, organized, and agile teaching. Students view online education as customizable, replicable, offering greater flexibility in terms of time and location, and accessible to students who, due to medical reasons, cannot physically attend traditional classes[22].

Some students raised the possibility of using face-to-face classroom time to create an active learning environment with Q&A sessions, quizzes, practical procedures, and other activities that move away from content-based teaching. This model is similar to the well-known and widely used flipped classroom method[23]. The stimulating environment for reflection fostered by the instructor in a face-to-face classroom is deemed more advantageous, as it can enhance motivation, student engagement, participation, and the development of social skills, problem-solving abilities, and the perception of multiple intelligences, among other aspects[24].

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It is particularly noteworthy that students have several suggestions regarding adherence to schedules by instructors and the reorganization of the course timetable based on the implemented curriculum. There is a recurring complaint about teachers not following established schedules, rescheduling classes on the eve of their occurrence without justification, and postponing practical sessions without prospects for makeup, among other habits that do not align with the semester planning. Some students believe that responsibility should be a two-way street: students should be careful not to miss deadlines for their academic responsibilities, while instructors should fulfill their obligations with the same rigor and commitment expected from the students[25].

In this context of delays and irregular timetables, a situation emerges that could undermine the value and credibility of hybrid education: remote classes conducted at the discretion of individual instructors. It was reported in some students' statements that they disagreed with the maintenance of online classes because they believed that teachers, even after returning to in-person classes, were not willing to conduct face-to-face lessons, instead opting for improvised video calls and recorded classes. There are several post-pandemic education recommendations, which include well-structured interactive, responsive, and authentic virtual experiences meticulously designed to actively engage students, provide real-time feedback from instructors, introduce authentic clinical cases, and conduct virtual experiments[26]. Consequently, delivering remote classes opportunistically, merely transferring the traditional instructor-centered approach to the online environment, is not an approach that resonates with the students.

Methods of assessment received suggestions for improvement from the participating students. There is a recurring need to diversify assessment methods beyond the classic theoretical exam. In the literature, various possibilities for assessing a curriculum component in a medical course are discussed[27]. Assessment in medical education serves to support the learner's development in line with the curriculum, identify areas for educational improvement, and act as a feedback tool between students and instructors[28]. Restricting assessment to a single method, as reported by the students, obstructs the attainment of these objectives and may be viewed as demotivating and counterproductive.

CONCLUSION

The study revealed that the pedagogical strategies employed during remote learning, such as the use of online platforms and asynchronous access to materials, were effectively integrated into in-person education. This continuity underscores the value of these tools in the post-pandemic educational environment.

The students encountered significant challenges, including increased financial costs and the need to readapt to in-person learning. These challenges led to uncertainty and fatigue but were largely mitigated by the return to the classroom environment. Despite these difficulties, the students appreciated the return to in-person education, noting benefits such as greater interest, improved concentration, motivation, and more meaningful interaction with the faculty.

Faculty performance was generally satisfactory, particularly in the use of digital technologies. However, the students expressed a preference for reducing reliance on these technologies during in-person classes, advocating for a more interactive and face-to-face approach.

Based on the findings, it is recommended that post-pandemic medical education adopt dynamic teaching methods, strategically incorporate hybrid ICT use, improve class scheduling, diversify assessment methods, and enhance faculty support and recruitment to better meet evolving educational demands

AUTHORS' CONTRIBUTION

Louise Helena de Freitas Ribeiro contributed in the study concept, data curation, formal analysis, investigation, methodology, project administration, resources, software, supervision, validation, visualization and writing of the manuscript. Mariana Ferreira Augusto contributed in the funding acquisition, investigation, methodology and resources. Larissa Denise Oliveira Dantas contributed in the data curation, formal analysis, investigation, methodology and resources. Maria Eduarda Varela Cavalcanti Souto contributed in the study concept, data curation, formal analysis, investigation, resources, software and writing of the manuscript. Ellany Gurgel Cosme do Nascimento contributed in the study concept , data curation, formal analysis, funding acquisition, investigation, methodology, project administration, resources and validation. Thales Allyrio Araújo de Medeiros Fernandes contributed in the study concept , data curation, formal analysis, funding acquisition, investigation, methodology, project administration, resources, software, supervision, validation, visualization and writing of the manuscript.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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