

THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN MEDICAL TRAINING DURING THE COVID-19 PANDEMIC FROM THE VIEW OF THE VARIOUS ACTORS

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Abstract: The COVID-19 pandemic has led to changes in Medical Education. After the institution of social distancing measures, the Ministry of Education authorized the replacement of face-to-face subjects with virtual ones. **Goal:** The goal of this study is to analyze the effects, limitations, benefits and consequences of virtual teaching in the pandemic and in Brazil. **Methodology:** This is a cross-sectional study with an exploratory and descriptive goal, with a bibliographic review and a subsequent qualitative and quantitative approach to the responses obtained in the form. **Results and Conclusion:** Sample of 126 students from 18 institutions and 27 professors from 6 institutions. Most institutions took about a week to adapt, with difficulties such as lack of technical training and support. Most students had synchronous classes, having quality internet, laptop and cell phone. Virtual teaching generated psychological stress in 81.0% of students and 51.9% of teachers, with female sex being a risk factor. Furthermore, psychological stress is related to productivity and time management. 96.8% of the students stated that the quarantine made it possible to participate in events that they would normally not be able to attend. Most students and teachers thought that part of virtual teaching and the insertion of ICTs must continue in the post-pandemic period.

Keywords: Telemedicine. Information and Communication Technology. Tele-education. COVID-19. Medicine.

INTRODUCTION

The COVID-19 pandemic, declared by the World Health Organization (WHO) on March 11, 2020, led to important changes in health and medical education in Brazil. Due to the institution of social distancing measures, the Ministry of Education (MEC) authorized, in the Official Gazette of the Union, the replacement of face-to-face disciplines in

progress with classes that use information and communication means and technologies (TICS) in federal and private institutions. of higher education. This scenario highlighted the importance of ICT as tools for teaching and the need to recognize tele-education as a legitimate teaching modality.

Lee and McLoughlin (2010) define distance learning as a “set of approaches and educational systems aimed at providing students with greater choice, convenience and customization to meet their needs” and believe that flexible teaching allows students to choose where, when and how to acquire knowledge, using ICT to support the teaching and learning process. With great importance in epidemics and pandemics, tele-education uses ICT tools to build and improve the knowledge of students and professionals from different areas of knowledge.

Studies indicate that the main limitations in the development and implementation of medical tele-education include time constraints, poor technical skills, inadequate infrastructure, lack of institutional strategies and support, and negative attitudes of all involved. Solutions to such problems include improving educator skills, rewards for developing online content, improving institutional strategies and support, and positive attitude among those involved (O’Doherty, et al., 2018).

Given this context, the goal of this study was to analyze the effects, limitations, benefits and consequences of virtual medical teaching through ICT in the pandemic period, through research with students and professors of public and private medical schools in Brazil.

MATERIAL OF METHODS

The research had as objects, students and professors of higher education institutions that offer the medicine course in Brazil, focusing on the State of Espírito Santo, covering students

from the 1st to the 12th periods of private and public institutions, being randomly included a public and one private, from each Brazilian region, totaling 16 national institutions. Access to medical school students and professors was carried out through social networks and through personal contacts of students and professors at Universidade Vila Velha with other institutions. Finally, data were collected over 4 months, covering the period from April to July 2021, reaching 126 students and 27 teachers.

This is a cross-sectional study with an exploratory and descriptive goal based on previous reading of articles published from 2016 onwards found on the SciElo, Pubmed and Oasis platforms, with a subsequent qualitative and quantitative approach to the responses obtained by filling out the form created on the Google platform. Forms, disclosed to students and professors of the medicine course who fit the inclusion criteria, which consist of professors who teach at the present moment of the research in the medical course of Brazilian private and/or public institutions and students properly enrolled in the course of medicine in progress during the occurrence of the research.

The online forms (Google Forms) were built with different variables for students and teachers, seeking to evaluate the individual experience of students and teachers, and the adaptability of each educational institution during the COVID-19 pandemic in the period 2020/2021, identifying the difficulties, benefits and needs in the face of the pandemic scenario.

The prescriptive analysis of the data collected by the tools available in the Google Forms program was carried out by tabulating and creating graphs and tables using the Microsoft Office Excel program. Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS)

20.0. Descriptive analyzes (means, standard deviation, percentages) were performed for all results. To calculate the association between categorical variables of exposure and outcome, univariate analysis was initially performed, using the chi-square test, when indicated.

The research was approved by the Research Ethics Committee of "Universidade de Vila Velha" under the registration number: 36199120.1.0000.5064, and submitted to Plataforma Brasil, and applied after agreement with the Free and Informed Consent Form.

Refusals were supported by non-agreement with the TCLE made available at the beginning of the online survey. The scope of the survey was hampered by the chosen survey tool, with a large number of refusals to fill it out.

RESULTS

The final sample comprised 126 students, with 64.3% (N=81) of the sample representing themselves as female. Regarding age group, 91.3% (N=115) are between 18 and 25 years old, with the minority (0.8%, N=1) over 41 years old. We received data from students from 18 Brazilian institutions, with representation from all geographic regions, most from the Southeast region with 96.8% (N=122) representation. Still regarding the institutions, 96.8% (N=122) of the students study in a private medical course and only 3.2% (N=4), in a public institution course, in addition, 81.7% (N=103) study at an institution with a PBL (Problem Based Learning) teaching method, 7.9% (N=10) in hybrid education and 10.3% (N=13) in traditional education. Regarding teachers, there were 27 responses, 51.9% (N=14) female and 81.4% (N=22) of the total are over 42 years old. We received data from professors from 6 Brazilian institutions, representing only the Southeast region. Still regarding the institutions, 33.3% (N=9) work in more than one faculty, with 21 professors (77.8%) teaching in a private medical course

and only 14.8% (N=4), in a course at a public institution, in addition, 55.6% (N=15) work in an institution with a PBL teaching method (Table 1).

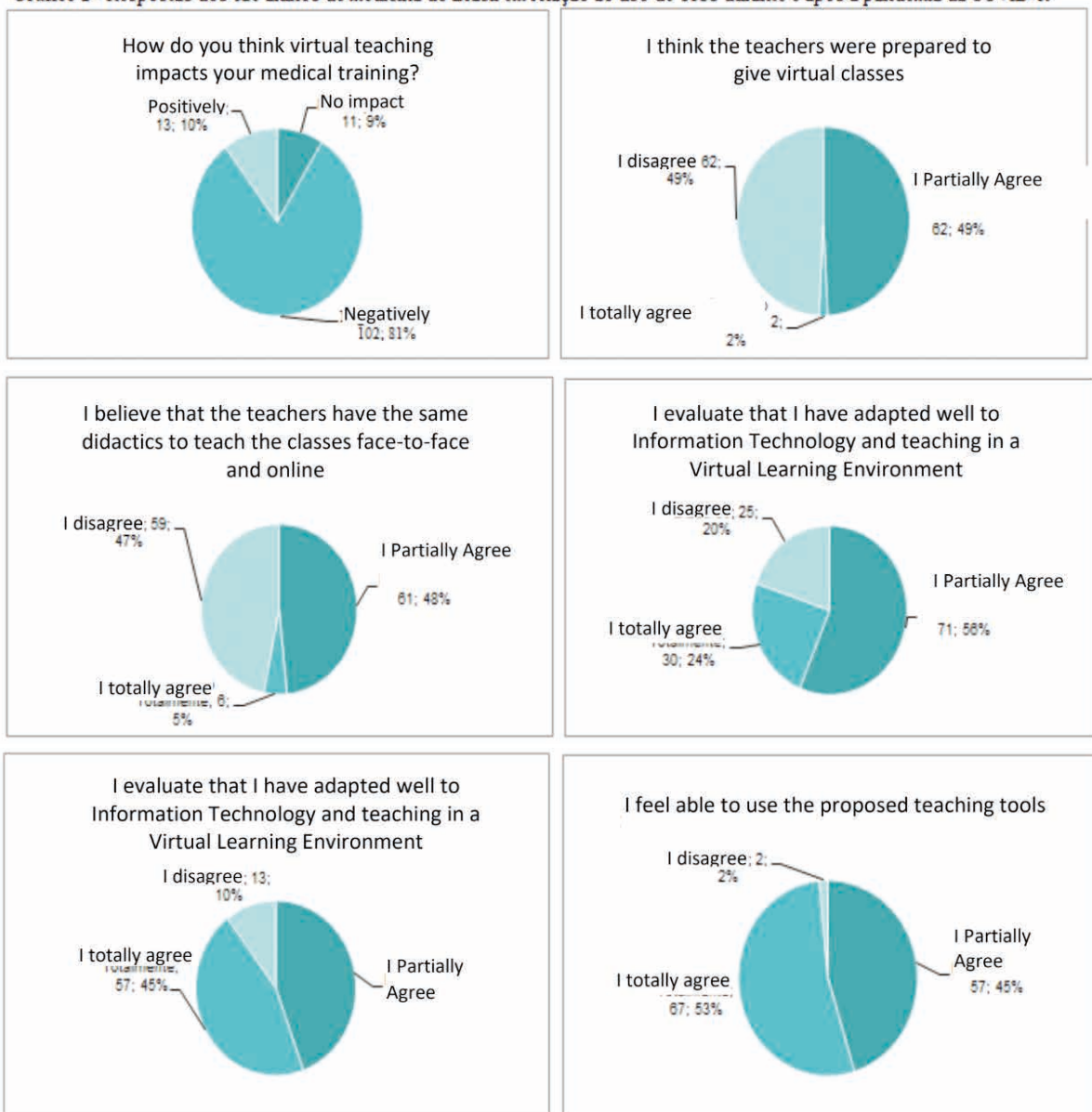
Regarding the use of ICTs, 92.9% (N=117) of respondents had their classes synchronously during the pandemic, while 7.1% (N=9) had their classes in a hybrid way, with the majority using Microsoft Teams (78.6%, N=99), followed by Zoom (2.4%, N=3) and Google Meets (2.4% n=3). The platforms used for classes and assessment activities were mostly Google Forms and TBL Active (37.3% N=47). It was seen that 21.4% of students (N=27) disagreed that their institution has efficient support for solving problems involving the virtual teaching platform chosen by it. 46% of students (N=58) reported that there was no incentive and training for the use of these tools by the institution, when training was provided, it was through an online tutorial (17.5% N=22), link to the application's support page (9.5% N=12), class with an instructor from the institution (3.2% N=4) or guidance from classmates (3.6% N=2). Most students (87.3% N=110) have quality internet to attend classes, no student reported not having internet during the pandemic. Most students have a cell phone and notebook (59.9% N=75) as electronic devices to access virtual classes, no student only had a cell phone for this purpose. In addition, the majority (97.6% N=123) were able to use an individual device and only 2.4% (N=3) of the sample were expected to share their device with someone. In parallel, 44.4% (N=12) of the professors partially agreed if they felt able to use the proposed teaching tools, and this same percentage reported having used other tools in addition to those instituted by the faculty. Only 1 (3.7%) professor reported that the tools adopted by the faculty ensure the security of their data compared to 19.0% (N=24) reported that they were not confident

about their use of data by the faculty.

Adaptation to virtual teaching was also evaluated, with 77% (N=97) of students in the basic cycle suffering from the suspension of face-to-face theoretical activities, compared to practical activities, which 83.3% (N=105) had their face-to-face classes interrupted. This prejudice was also shown in the boarding school, where 23% (N=29) of the students temporarily lost their work in their mandatory curricular internship field. There were 19.8% of students (N=25) who disagreed with this

good adaptation to the use of ICTs and on the other hand, 33.0% (N=10) of teachers did not believe that they were prepared to teach classes in virtual mode, in addition, 44.4% (N=12) strongly disagreed that students were prepared for virtual classes. Furthermore, 46.8% of students (N=59) disagreed that teachers have the same didactics to teach face-to-face and virtual classes (Table 1). In addition, 49.2% (N=62) do not believe that their teachers were prepared to give these virtual classes (Graph 1).

Gráfico 1 - Respostas dos 126 alunos de medicina do Brasil em relação ao uso de TICs durante e após a pandemia da COVID-19



The pandemic had an impact on students' education, it was noted that 81.0% (N=102) of students reported that virtual teaching had a negative impact on their medical training. In addition, 51.6% (N=65) were unable to maintain productivity and good time management during the pandemic and even generated psychological stress in 81.0% (N=102) of students.

Questions	
I believe that the quality of the face-to-face classes was maintained in the virtual modality	
Partially Agree	22 81,5% Totally Agree
Totally Agree	1 3,7% Disagree
Disagree	4 14,8% I believe that
I believe that I have the same didactics to teach face-to-face and virtual classes	
I agree Partially	21 77,8% I agree Partially
I totally agree	4 14,8% I totally disagree
Strongly Disagree	2 7,4% Agree Partially
I believe I was prepared to teach the classes in the virtual mode	
Partially Agree	13 48,1% Agree Partially
Totally Agree	2 7,4% Disagree
Partially Disagree	8 29,6% Totally Disagree
Totally Disagree	7,4% Neither Agree nor Disagree
Neither Agree nor Disagree	7,4% Agree
I think that the students were prepared for the virtual classes	
Partially Agree	14 51,9% Agree
Totally Agree	1 3,7% Totally Disagree
Strongly Disagree	12 44,4% Strongly Disagree

Table 1 -Perception of the 27 teachers regarding the use of ICTs in virtual teaching

One can observe quotations from students about the reasons for the negative influence of online teaching on productivity and time management: "External factors due to the lack of an individual space and poor quality of the internet" "The fact of being at home and not having a routine as it was in face-to-face" "Initially the radical change from face-to-face to online, later I had problems related to attention, focus and discipline" "mental and psychological exhaustion caused by the pandemic scenario negatively influenced my productivity".

Others reported positive responses: "Less time spent and fatigue commuting" "I ended up having "more time" for the scientific work I wanted to do and parallel studies".

There are also quotes about the reasons for psychological stress in virtual teaching: "Excessive activity, tight deadlines, the evaluation method and the emotional state that everyone is in ended up interfering with productivity and interpersonal relationships" "Disorganization of the university towards students. students" "Excessive synchronous and asynchronous classes, lack of didactics and lack of adaptation by teachers, sometimes trying to be more resilient in terms of knowing things in class, because they think that teaching a recorded class is synonymous with learning something, which is not the case." "The concern about not properly absorbing the contents, especially the practical subjects." "Connection problem at important times" "Excessive charge".

This impact was also observed on teachers: 55.6% (N=15) were unable to maintain productivity and good time management during the pandemic and 51.9% (N=14) of teachers reported psychological stress.

Citation of some reports on the reasons for this drop in productivity of teachers: "The number of virtual meetings, both in relation to Teaching and Research", "Stress, uncertainties, new ways of working, anxiety and child care", "Much more time devoted to teaching activities and their recording", "Need for adaptations and the volume of tasks, patients and students".

Quotes about what brought more psychological stress on teachers: "Overwork" "Inability to feel the students' reaction" "The impossibility of experiencing the University environment and, logically, the lack of face-to-face daily contact with students and with my work colleagues" "Lack of student feedback and standardized evaluation methods" "Tiring

method”.

By correlating several variables with the presence or absence of stress, it was observed that gender ($p=0.002$), belief in the impact of virtual teaching on medical training ($p<0.001$) and the assessment of productivity and time

management impacted statistically relevant in this psychological disorder. For this research, the institution’s teaching method, encouraging training in the use of ICTs and adapting to the use of these tools did not show a statistically significant value (Table 2).

Variable	Yes %	No %	
Gender			
Female	57.1%	7.1%	0.002
Male	23.8%	11.9%	
Teaching method			
Traditional	7,1%	3,2%	0.425
Hybrid	7.1%	0.8%	
PBL*	66.7%	15.1%	
Training in the use of ICTs			
Yes	39.7%	6.35%	0.382
No	20.6%	6.3%	
I Don't know	20.6%	6.3%	
Impact on medical training			
No impact	3.2%	5.6%	<0.001
Negatively	73.0%	7.9%	
Positively	4.8%	5.6%	
Good time management in the pandemic			
I Partially agree	32.5%	9.5%	0.001
I Totally agree	2.4%	4.0%	
I Disagree	46.0%	5.6%	

Table 2 - Relationship of the presence of psychological stress in the 126 students generated by the pandemic and variables of this research

However, the quarantine made it possible to participate in events that students would normally not be able to participate in the agreement that was reported by 122 students (96.8%). Since 45.2% (N=57) were able to participate in 11 events or more, only 1.6% of students (N=2) were unable to participate in any online extracurricular event during the year 2020.

DISCUSSION

LEARNING TOOLS

With MEC’s authorization to replace face-to-face classes with virtual classes, the use of virtual learning tools increased. The use of ICTs was already a reality in the medical

course at many universities, being more valued and highlighted during the pandemic period. Classes and activities have been made available synchronously, asynchronously and in the hybrid model. Synchronous classes and activities proved to be extremely beneficial, as students get involved and are motivated in a simultaneous encounter with other people (Dotta & Oliveira, et al., 2013). In this research, 92.9% (N=117) of the students interviewed stated that they had synchronous classes and activities, which shows a positive aspect of the educational institutions studied.

Although many universities already had distance courses before the pandemic, some obstacles were observed by students. In the

present study, 21.4% (N=27) of the students think that the university does not have enough support for solving problems involving the learning platform they use. Concomitant with the lack of technical assistance, 46% (N=58) of students reported that there was no incentive and training for the use of learning tools. Among those who took some kind of training, most used the support page of the application in use, and only a small portion received guidance from a professional at the institution. It is evident that there are also challenges to carry out the professionalization of teachers, parallel to the difficulty in pedagogical qualification and in the use of new teaching methodologies (Lobo, Maia, 2015). Such considerations are supported by the present research, since 44.4% (N=12) of the professors felt only partially able to use the proposed teaching tools, and this same percentage reported having used other tools in addition to those instituted by the faculty. It must be included the fact that a minimum number of students N=1 (3.7%) reported that the tools adopted by the faculty guarantee the security of their data. In summary, the discussed factors point to the difficulty of adapting to distance learning in the institutions studied.

The quality of the students' internet access to classes and virtual activities was questioned. Most professors (87.3%, N=110) have quality internet to carry out the remote study, and no student reported not having network availability to access classes during the pandemic. Such results were related to the research sample being predominantly from private higher education institutions where most participants have income that allow good quality access. Despite this assumption, it was noted that the greatest discrepancy in internet quality was noted in elementary school students. In the superior, however, this inequality is less clear (Nascimento, Ramos, et al., 2020). Public universities made adaptations

for the implementation of remote teaching, such as the provision of notebooks, tablets, cell phone chips and mobile data packages. Despite this assistance, few students resorted to obtain it (Castioni, Melo, et al., 2020). However, it was found that these changes are still far from expected in relation to private institutions (Freitas & Trotta, et al., 2020).

It was also shown that most students have cell phones and notebooks (59.9%, N=75) available for virtual classes, a reflection of a society where the majority of the population has access to ICTs (Gertler, Lora, et al., 2019). We can also observe that no student had a cell phone just for educational purposes and that 97.6% (N=123) were able to use at least one of the devices individually.

ADAPTATION TO VIRTUAL TEACHING

The use of digital technologies has expanded educational strategies, and with it the demand for methodological training that is suitable for present and future generations. Teaching environments expand and provide access to information, as well as enabling the exchange of knowledge without the need for teachers and students to occupy the same physical space (Riedner & Pischetola, 2016).

According to Caliari et al. (2017) one of the main challenges faced by higher education institutions that cover activities for Distance Education is the provision of quality in undergraduate courses with the tools derived from ICT. So, according to Caliari, education and the use of technology in its process must be understood as a dynamic process that stimulates a lot of reflection. This fact occurs through the use of new pedagogical practices and teaching methodologies, which are transformed as the scenario changes. In addition, research indicates that the intimate contact of current generations with technology resulted in the development of

a new type of neuroplasticity, and therefore, they have habits and learning mechanisms that must be respected and considered in the dynamics of teaching and learning, in order to enhance them. (Biscardi & Rondina, 2017)

During the quarantine period due to the pandemic, there was an interruption of activities, in which institutions, together with students and professors, had to adapt to the demands of the medical course and maintain the quality of teaching required by it through virtual teaching through Information and Communication Technologies (ICTs). It can be seen that few students disagreed about the good adaptation to the use of ITs, however, a majority of respondents assess that virtual teaching negatively impacts their medical training, despite reporting being able to use the proposed teaching tools (Chart 1). This finding conflicts with the teachers' perception of students and their preparation for virtual classes, in addition to the fact that a portion of teachers did not believe that they were prepared to teach classes in virtual mode.

The review published in *Revista de Gestão* in 2017, made by Caliar, et al. sought to identify the variables that influence the action of technological innovation in face-to-face higher education and to understand the relationship that exists between them, in addition to the investment in information and communication technology and systems made by educational institutions, with the aim of improving student performance and teachers, together with the understanding of this adoption of support tools. That is, it is a theoretical framework on innovation and the theories of diffusion and adoption of ICTs in face-to-face higher education.

The mismatch found in the research between student and teacher preparation is given by the difficulty in maintaining productivity and good time management on both sides, which interferes with the quality

of communication on the matter between the interlocutors. To this end, factors that influenced the drop in productivity and good management of teachers' time were reported, including the number of virtual meetings, both in relation to teaching and research, stress, uncertainties, the new way of working, anxiety, demanding family members such as children and the presence of third parties, spending more time dedicated to teaching activities and recording classes, the urgent need to adapt, the volume of tasks and demands of patients and students, leading to psychological stress based on overwork, incapacity of "feeling" the students' reaction, impossibility of experiencing the university environment, lack of face-to-face daily contact with students and co-workers, lack of student feedback, standardized evaluation methods, tiring method, among others. While for the students, the main factors were based on external factors due to the lack of an individual space, low quality internet for a portion of the students, the domestic factor that does not provide a routine such as face-to-face teaching, the radical change to online teaching, difficulties in having attention, focus and discipline, mental and psychological exhaustion due to the pandemic scenario, however some positive factors were mentioned such as less time spent and tiredness with commuting, consequently having more time for extracurricular work, such as scientific work and studies parallel. However, the negative points brought the psychological stress related to virtual teaching such as excessive activity, short deadlines, evaluation method, the emotional state in the face of the pandemic, disorganization of institutions towards students, the amount of synchronous and asynchronous classes in excess, lack of didactics and adaptation of teachers who try to be more resilient regarding the student's knowledge, believe in the student's point, that

a recorded class is synonymous with learning something, which disagrees with reality, in addition to the concern about not properly absorbing the content, mainly related to the practice that was interrupted with the beginning of the quarantine together with the internship and the theoretical one, problem of internet connection at important times, the exaggerated demands coming from the teachers, among others.

In order to understand how this advancement of technologies in the educational environment of medicine could occur, it is necessary to elucidate and understand the disparities that make generation Y, that is, those born after 1980, more adaptable to new information and communication technologies. Some authors, such as Lombardía (2008) and Oliveira (2015), exposed by Biscardi and Rondina (2017), argue that generation Y developed, under the stimulus of the Internet and electronic games, the right hemisphere of the brain, in contrast to the right hemisphere. left responsible for activities such as reading and cartographic interpretations. And due to this uniqueness, the traditional teaching method may no longer be as efficient in transmitting knowledge, despite the hypotheses of a new manifestation of the neuroplasticity of this generation still need further scientific studies.

The study carried out by Prober in 2012 brought the concept to the phenomenon they called Flipped Classroom, in which institutions adhered to new technologies to customize classes and optimize students' time, taking advantage of the qualities of information transmission through digital media, making it possible to the promotion of discussions and debates that may instigate the intellectual improvement, such as critical thinking, of students. The importance of these tools for adapting learning to the student's pace was also observed, since it makes the schedule

more flexible and has greater adherence and popularity among the group (Biscardi & Rondina, 2017).

Despite the need for improvement on the part of professionals and the increased incidence of students in search of methods that depart from the traditional, the structure and preparation of universities may still be deficient to propose a specialized environment that actually embraces these new learning tools. Not only are educational institutions not prepared, but internet access in Brazil dates back to the mid-1990s, which in 2020 is still not democratic for Brazilian students.

EXTRACURRICULAR ACTIVITIES

The quarantine allowed a quantitatively greater participation of students in events that normally students would not be able to attend, this agreement is reported by 122 students (96.8%) and is linked to the result obtained by a survey carried out in the period of the last 12 months preceding the month of June 2021, with 34,000 events from a platform managed by Startup Even3, which showed a growth in the number of online Events in which it reached 300% compared to previous years. This way, the very expressive increase in the number of online events that took place during this period of quarantine allowed not only that several students from different universities and locations could enjoy an exchange of knowledge that would not be possible with such ease in the face-to-face modality, since time and space factors would be the main obstructors of these events. This corroborates the findings of the research, in which a majority of the students were able to participate and take advantage of opportunities via face-to-face telephony, which was impossible by conventional pre-pandemic face-to-face means, since the majority managed to participate in more than 10 events that before would not be possible.

So those who did not participate in more than 2 events may have had other reasons that are not limited to the possibility of access to the event.

STRESS FACTORS

In the present study, when asked whether virtual teaching generated some form of psychological stress, 81.0% (N=102) of students agreed. The pandemic has generated an increase in psychological stress globally, with social isolation, disruption of medical education and training, and virtual teaching. When it comes to medical students, the problem is accompanied by a lower use of mental health services due to stigma, concerns about confidentiality and the idea of self-sufficiency to deal with their own mental health problems (Meo, et al., 2020). In addition, medical students undergoing mental health follow-up may face difficulties in time management, implying obstacles in regular therapy sessions and replenishing current medications (Usher, et al., 2020). A meta-analysis of 183 articles suggests that medical students are at increased risk for stress and mental disorders, with a significantly higher prevalence of depression, depressive symptoms and suicidal ideation than the general population. However, prevalences vary widely in the literature (Rotenstein, et al., 2017). As for the analysis of the correlation between the gender variable and the presence of psychological stress by the students, this research showed that being a woman or a man has some influence on this disorder (p value <0.002). As well as the feeling of impact on medical training (p value <0.001) and time management and productivity during the pandemic (p value = 0.001), no other variable had a statistical impact (Table 2).

Among the students participating in this study, 88.8% (N=81) of women and 66.6% (N=45) of men stated that virtual teaching

generated psychological stress. In a survey carried out at King Saud University, when asked about “feelings of hopelessness, exhaustion or no emotional response during the quarantine period”, 39.4% of female students and 36.44% of medical students agreed with the statement (Meo, et al., 2020). Similarly, a survey by “Universidade de Tiradentes” that used the Self-Report Questionnaire (SRQ-20) to track psychological distress found that 62.8% (N=656) of individuals showed signs of psychological distress, with 80.6% of these females (Teixeira, et al., 2021).

A major challenge of the pandemic was to maintain productivity and good time management by studying at home. Of the students who claim to have suffered psychological stress due to virtual teaching, 56.8% (N=102) did not maintain productivity and good time management, 2.9% (N=102) maintained and 40.1% (N= 102) partially maintained. It was observed in a study carried out at King Saud University, that 56.2% of students who felt that their study period had decreased and 56.1% of women and 43.6% of men agreed that there was a decrease in performance at work and in studies. Besides, 28.2% of female students and 37.7% of medical students said they had “difficulty concentrating on studies” (Meo, et al., 2020).

Most of the participating students thought that virtual teaching had a negative impact on their medical training (80.9% N=126). Among these students, 90.1% (N=102) claim to have suffered psychological stress during their studies during the pandemic. Only 10.3% (N=126) of students perceived a positive impact. However, even among these students, there is a considerable number of individuals who claim to have suffered psychological stress (41.6% N=13). A study carried out at the University of California found that most students felt that the quality of medical education had been affected in

some way by virtual teaching. Most students felt that practical curricular components were negatively affected, specifically in anatomy (66.2%), ultrasound (83.0%) and outpatient preceptorship (96.2%). The lectures (24.7%) and Problem Based Learning (PBL) (13.9%) were positively evaluated (Shahrivini, et al., 2020).

CONCLUSIONS

Throughout this study, it was verified that most of the students are using the synchronous class model, which is a positive aspect, since this way students carry out greater collective interaction. Some flaws and difficulties in the adaptation process were also observed, such as the lack of technical assistance, colleges that do not have enough support and professors who did not feel able to use the proposed tools. The vast majority of students have quality internet, together with the fact that they have a notebook and cell phone.

Most medical schools took about a week to restructure and adapt to virtual teaching, many students felt harmed by the suspension of face-to-face classes, negatively impacting medical training, correlating with the fact that they were not able to maintain productivity and good time management, generating psychological stress. As obstacles to adaptation, there was the non-adaptation of students to the use of ICTs, teachers who felt unfit for concomitant virtual classes, and students who also feel that teachers were unprepared to teach virtual classes, for example, because they did not have the same didactics.

The quarantine allowed more student participation in events that they would not normally participate due to the benefit of time and transportation factors. Despite the low initial adaptation to virtual teaching, most students believe that new ICTs must be included in the medical course even after the

pandemic, in addition to a portion agreeing that part of teaching can be maintained remotely.

You must state the significance of your finding. The conclusion must be written based on the goal/hypothesis.

The main impediments in the implementation of medical tele-education include lack of skills, institutional infrastructure, time constraints for those involved and, above all, lack of support and institutional strategies, points raised in the forms of this research. We suggest the formation of more training for educators, development of strategies and institutional support.

The psychological stress generated by the virtual study was high in the studied population. According to the data obtained in the present study and in the reviewed studies, it can be inferred that the female gender is a risk factor for stress and mental disorders. It was still possible to conclude that psychological stress has a strong relationship with productivity and good time management, affecting the period of study and concentration. Given the above, it is extremely important that the mental health of medical students is valued. Telehealth can provide support to medical students in need of psychological follow-up and time constraints. Mentoring and Team Based Learning (TBL) groups can also contribute to learning, discussions and decreasing feelings of isolation.

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