

# **REVIEW OF MEDICINE GRADUATES ABOUT REMOTE TEACHING OF EMERGENCIES AND EMERGENCIES DURING THE COVID-19 PANDEMIC IN NORTHEASTERN BRAZIL**

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**Abstract:** The objective of this study was to identify the appreciation of students of the undergraduate course in medicine at “Universidade Federal da Paraíba” (UFPB) regarding disciplines of urgencies and clinical emergencies taught under the Remote Emergency Teaching (EER) modality in additional periods during the pandemic of coronavirus disease 2019 (COVID-19). An observational and cross-sectional study, with a quantitative approach, was carried out online based on the application of a questionnaire using the Google Forms application. The sample consisted of 108 students from UFPB, João Pessoa-PB, Brazil, who attended two disciplines of clinical urgency and emergency. The mean age was 22.8 ( $\pm$  3.9 years), 56 were female (51.9%). Most declared themselves white (51.9%), living with their parents (70.4%) and coming from the city of João Pessoa (55.6%). Most dedicated themselves exclusively to student life (81.5%), single (96.3%) and family with an average per capita income of R\$ 2,762.13. It was observed that 59 participants (54.7%) stated that they preferred Attendance teaching, which was an unexpected result, as it was believed that a higher percentage would have such a preference, when it comes to courses on urgencies and emergencies, which are eminently practical. A positive association was found between white race/color and preference for the EER, which may be associated with the issue of social inequalities. There was a report of good digital ability by most students, with ease in following classes and carrying out activities in the EER (60%). The main Advantages of the EER reported were Flexible schedule (76.9%), Convenience (84.3%), Safety (64.8%) and access to content (60.2%). The main Disadvantages related to the EER were greater mental concentration (63.9%) and home environment tasks that interfered in the classes (51.9%). It is

concluded that the appreciation of students was favorable among white students with easy logistical access to the internet, a frequency lower than expected in relation to the preference for teaching Attendance for urgent and emergency subjects, with Advantages and Disadvantages in relation to teaching Remote. These results suggest that blended learning could be evaluated in the learning of medical students after the pandemic.

**Keywords:** Emergencies. Medical Education. Online learning. Surveys and Questionnaires. pandemic of COVID-19.

## INTRODUCTION

The disease pandemic caused by the new Coronavirus 2019 (COVID-19) interrupted Attendance teaching in a large number of higher education institutions in Brazil in March 2020, mainly affecting undergraduate courses in the area of Health. Considering that the most effective prophylactic measure for COVID-19 in 2020 was social distancing, face-to-face classes were suspended in order to protect professors, students, employees and patients of university and insured health services. In Brazil, the Northeast Region had the highest rate of federal universities with suspended activities and, therefore, the highest rates of adherence to Remote teaching (CAVALVANTI; GUERRA, 2022).

In view of the decrease in the social impact related to the suspension of university activities, therefore as the students' bond during the health crisis, face-to-face activities were adapted to be transposed, through digital tools, during the most critical phase of the pandemic. With government support from the Ministry of Education, the new teaching modality required the use of information and communication technologies (ICTs). Among these technologies, videoconferences intermediated by free platforms have become the main means of teaching and learning,

associated with asynchronous online activities. Such technological procedures allowed the so-called “remote emergency teaching” (BACZEK et al., 2021).

Medical education did not have scientific evidence of remote emergency teaching (EER) to support effective pedagogical practices adapted to the crisis context, especially in essentially practical disciplines, such as the teaching of medical urgencies and emergencies (CALHOUN et al., 2020). Within the scope of these curricular components, practical classes allow medical students to organize their clinical reasoning in an experiential way to develop psychomotor and communicative technical skills in critical situations (ALSOUFI et al., 2021). In this sense, in clinical medicine, it is essential that the practical teaching-learning process be Attendance, necessary for the real and effective use of undergraduates, which demanded the execution of a series of adaptations not previously tested to maintain the quality of teaching required for future doctors. Prior to this pandemic period, Remote teaching in medical graduation was not considered in Brazilian universities.

Although hybrid or mixed education (association of Remote and Attendance teaching) has been adopted in several medical undergraduate courses, exclusive Remote teaching has been an exceptional experience, mainly in underdeveloped and developing countries, such as Brazil. On the other hand, in the context of an unprecedented health crisis in the last 100 years in several countries around the world, all professors and managers needed to rethink the university didactic-pedagogical process (SEMERTZIDOU, 2021). Thus, it is important to evaluate the use of the EER modality in a curricular component related to the teaching of urgencies and clinical emergencies and determine its appreciation by undergraduate medical students.

Therefore, the present study aimed to

identify the appreciation of students of the undergraduate medical course at UFPB on disciplines of urgency and clinical emergencies under the modality of EER offered in additional periods during the COVID-19 pandemic.

## METHODS

This is a quantitative and descriptive cross-sectional study, carried out online through the application of a questionnaire using the Google Forms application. The sample consisted of university students of the medical course at the “Universidade Federal da Paraíba” (UFPB), Campus I, João Pessoa-PB, Brazil, who attended, in the remote modality, disciplines of clinical urgency and emergency, in an additional period after the suspension of all face-to-face activities of the institution. The UFPB medical course is the oldest and most important medical school in the state of Paraíba, in the Northeast of Brazil, where professionals are trained who become part of the most diverse health services in the region and in the country.

The sample consisted of 108 students who attended two disciplines of medical urgencies and emergencies in the supplementary semester in the EER modality: the first care techniques in urgency and emergency (DUE1) and the clinical and social approach in urgency and emergency (DUE2) of the UFPB in exclusively remote modality. The inclusion criteria used were students who attended the DUE1 and DUE2 of the UFPB medical course, during the Remote period of 2020, of both sexes, who agreed to participate in the study and answered the questionnaires sent.

Participants were approached via e-mail, through which questionnaires prepared by the authors and standardized were sent, containing sociodemographic data, appreciation and personal experience of

the student regarding the Remote teaching received, their appreciation of Attendance education and their expectations about the future process of post-pandemic teaching-learning.

The sociodemographic variables were age, sex (male and female), race/color (white, yellow, indigenous, black), marital status (single, married, stable union, widowed and divorced), schooling prior to medical school (higher education incomplete, complete higher education and postgraduate), per capita income (in reais) and origin (capital João Pessoa or another city). The race/color variable was dichotomized for analysis purposes (white and non-white).

The students were asked about their assessment of the fulfillment of the disciplines (DUE1 or DUE2), interaction with the teacher, motivation, achievement, study routine, technological resources. In addition, questions were asked about the main Advantages (Flexible schedule, Convenience, Safety, faster learning, less or more tiring, content review, free access to content, freedom of learning and less or more attractive) and Disadvantages (difficulty of clarify doubts, lack of computer knowledge, Less illustrative resources, lack of self-interest, Lack of teacher interest, difficulty understanding the material, negative influence of domestic commitments, greater or greater deconcentration) of the EER.

The students also answered, on a Likert scale, about Internet access variables, availability of time to study, access to the internet and computer, ability in digital platforms and computational tools, conditions to attend courses remotely and ease in following classes and carrying out The activities.

Analyzes were performed using the statistical application Statistical Package for the Social Sciences (SPSS), version 20.0 for Windows. Descriptive estimates were

determined (Frequencies for categorical variables, and means or medians, with standard deviation or amplitude for quantitative variables. Bivariate analysis was used, by applying association tests (chi-square test) to assess dependence between variables explanatory with the dependent variable (preference for teaching modality), associations that reached a probability of less than 5% ( $p < 0.05$ ) were considered significant.

This study was approved by the Research Ethics Committee of the Medical Sciences Center of the “Universidade Federal da Paraíba” on 03/27/2020, under opinion number 4,615,986, and the precepts governing research with human beings of Resolution 466/2012 were followed.

## RESULTS AND DISCUSSION

The sample of 108 students had a mean age of 22.8 ( $\pm 3.9$  years), 56 female (51.9%). Most declared themselves white (51.9%), living with their parents (70.4%) and coming from the city of João Pessoa (55.6%). Most dedicated themselves exclusively to student life (81.5%), single (96.3%) and their family had an average per capita income of R\$ 2,762.13. The sociodemographic characteristics of the participants are similar to those of studies with medical students carried out in Brazil (CAMPOS et al., 2022; BAMPI et al., 2013), corroborating the mostly white profile, with income higher than the average of the general population in the region, with financial support from the family and without gender difference (SOUZA et al., 2020). Considering that the average national per capita household income was R\$ R\$ 1,400 in 2020, according to the National Household Sample Survey (PNAD), while in Paraíba, still according to the IBGE (2020), this income was of approximately R\$ 900.00, the income mentioned in the sample studied was three times higher than the per capita average of families in Paraíba.

It was observed that 59 participants (54.7%) stated that they preferred Attendance teaching, which was an unexpected result, as it was believed that a higher percentage would have such a preference, when it comes to courses on urgencies and emergencies, which are eminently practical. Opposite to teaching in distance education (EaD), the offer of remote emergency teaching during the COVID-19 pandemic had little planned adjustments for online teaching, due to the lack of time for adequate planning, in terms of students' needs and of the teaching staff, in addition to relevant adverse pedagogical issues and limitations in technological resources (GUSSO et al., 2020).

There was no statistically significant association ( $p>0.05$ ) between preference for the type of education and sex, age, education, origin and marital status. However, there was a positive and statistically significant association between white race/color and preference for Remote teaching (Table 1), which may be related to disparities in access to ICT resources due to social inequalities.

Saviani (2020) emphasizes that EER cannot be equivalent to Attendance teaching, considering that the remote modality is admissible exclusively as an exception. The EER is different from Distance Education (EaD), not fulfilling the prerequisites defined for the latter modality. Remote activities through EER digital tools are guided by a different rationale than EaD, as it requires sending evidence of the development of non-evaluative activities. In this sense, the idea that the pandemic is a time when students "can learn to be more autonomous, bringing lasting benefits" (SARAIVA et al., 2020, p. 10) is a possible result. However, these same authors explain that the exclusive mediation by ICTs is a trigger for the growth of inequalities, which was much discussed about EER in the initial months of social isolation due to the lack of

resources of a large number of students at federal universities.

It was observed that 22.2% of students were available for more than four hours a day to carry out activities and follow remote classes, more often between two and four hours a day (51.9%). No statistically significant association was observed between insufficient availability of time and preference for remote teaching. All participants had access to a computer and Wi-Fi network availability, as well as logistical conditions to attend DUE1 and DUE2 subjects remotely. In addition, there was a report of good confidence in one's own electronic skills (59.2%) and ease in following activities by students in the use of digital platforms. The students thought that it was easy to follow the classes and carry out the activities in the EER (60%). A positive association, statistically significant ( $p<0.05$ ), was identified between good self-reported ability on digital platforms, therefore such as the ease of following classes and carrying out remote learning activities, with preference for remote teaching (Table 2).

The majority thought that there was a good use of technological resources by the teachers (74.1%) and that the majority had good interaction with them (63%), managing to establish a study routine (59.3%) and satisfactory use of the EER (55.6%). There was a positive association, statistically significant ( $p<0.05$ ), between the highest number of absences in remote teaching and the preference for face-to-face teaching. There was also an association between preference for EER with good interaction with the teacher, satisfactory performance, feeling of motivation and establishment of a study routine (Table 3).

However, about 59.3% of the participants reported that the remote teaching model would compromise their medical training and 55.6% preferred the face-to-face teaching modality for learning urgencies and emergencies. Menon et al. (2021) did not



Variables	Categories	Preferred mode of teaching		Statistics	
		Remote	Attendance	f	$\chi^2$
		absolute frequencies (f)/Categories		total	p
<b>Gender</b>	Male	23	29	52	0,42
	Female	26	30	56	
<b>Age</b>	18-20	12	19	31	0,24
	21-25	22	35	57	
	Over 26	6	14	20	
<b>Breed/color</b>	White	32	24	56	0,012*
	It is not white	16	36	44	
<b>Education</b>	College not concluded	40	60	100	
	College concluded	4	0	4	
	Post-graduation	4	0	4	
<b>Origin</b>	João Pessoa	28	32	60	0,698
	Another city	20	28	48	
<b>Marital status</b>	Single	38	66	104	
	Married	2	2	4	

$\chi^2$ : chi-square test; p: level of statistical significance; \*: statistically significant p at 5%; f: absolute frequency of participants per category

Table 1 – Relationship between sociodemographic variables and teaching modality preference in urgency and clinical emergency modules at a federal public university (n=108) in Paraíba, Brazil, 2020

Source: Primary research data (2021)

Variables/Categories	Preferred mode of teaching		f	p
	Remote	Attendance		
Availability of time/day				0,07*
Less than one hour	8	0	0	
Between 1 and 2 hours	8	12	20	
Between 2 and 4 hours	20	36	56	
Over 4 hours	12	12	24	
Internet and computer access				
Yes	48	60	108	
No	0	0	0	
Skill (digital platforms/computational tools)				<0,01*
Few skill	4	20	24	
limited ability	8	12	20	
substantial skill	20	16	36	
great skill	16	12	28	
Conditions for taking courses remotely				
Yes	48	60	108	
No	0	0	0	
Ease of following classes and activities				<0,01*
Extremely easy	16	0	16	
Easy	20	24	44	
Indifferent	8	24	32	
Hard	4	12	16	

p: level of statistical significance; \*statistically insignificant at 5%; f: number of participants per category.

Table 2 – Relationship of access and technical skill with preference for teaching modality of urgencies and clinical emergencies at a federal public university (n=108) in Paraíba, Brazil, 2020

Source: Primary research data (2021)

Variables/categories		Preferred mode of teaching		f	p
		Remote	Attendance		
Previous remote course	Yes	32	36	68	0,476
	No	16	24	40	
Highest number of absences	Yes	16	48	64	<0,01*
	No	32	12	44	
Good interaction with the teacher	Yes	36	32	68	0,017*
	No	12	28	40	
Use of technological resources	Yes	32	48	80	0,089
	No	16	12	28	
Study routine use	Yes	36	28	64	0,003*
	No	12	32	44	
Satisfactory use	Yes	36	24	60	<0,01*
	No	12	36	48	
Feeling of motivation	Yes	34	19	53	<0,01*
	No	14	41	55	

p: level of statistical significance; f: number of participants per category; \*statistically significant at 5%;

Table 3 – Association between previous experiences, current experience and teaching model preference in clinical emergency modules at a federal public university (n=108)

Source: Primary research data (2021)

Variables	Frequencies
<b>Advantages</b>	
Flexible schedule	83
Convenience	91
Safety	70
Faster learning	19
Free access to content	65
Freedom of learning	51
Most attractive modality	20
<b>Disadvantages</b>	
Difficulty clearing doubts	47
Lack of computer knowledge	18
Less illustrative resources	22
Lack of student interest	45
Lack of teacher interest	32
Dificuldade de entendimento do material	29
Disturbances in the home environment	56
Greater deconcentration	69

Table 4 - Description of the questionnaire item regarding the Advantages and Disadvantages of remote emergency teaching of urgent and emergency disciplines at a federal public university in an additional semester during the pandemic in 2020 (n=108)

Source: Primary research data (2021)

assess the satisfaction of medical students using a visual analogue scale as in the present study, but using a Likert scale, but showed that, among 319 participants in India, 49.8% of students were less satisfied with teaching remote and 15.7% were more satisfied, with a moderate degree of satisfaction in 53.6% of the students interviewed, high for 31%, and low, according to 15.4% of the sample.

The main Advantages of remote learning reported were Flexible schedule (76.9%), Convenience (84.3%), Safety (64.8%) and free access to content (60.2%). There was a high level of rejection in relation to the idea of attractiveness (81.5%) and faster learning (82.4%) of the EER modality. In addition, greater flexibility of time for learning in the EER was not considered favorable by 52.8% of respondents. These results are partially consistent with those of a cross-sectional study in Poland, involving 804 participants, carried out by Baczek et al. (2021), in which the main Advantages of remote teaching were the Convenience of staying at home, continuous access to materials, learning at your own pace and in a comfortable environment.

The main Disadvantages related to the EER were greater mental concentration (63.9%) and home environment tasks that caused interference during remote classes (51.9%). In research conducted in the United Kingdom, commonly perceived barriers to the use of online teaching platforms included family distraction (DOST et al., 2020). In the present study, the repercussion of the following variables were not considered Disadvantages by most participants: difficulty in clarifying doubts (43.5%), lack of computer knowledge (16.7%), fewer illustrative resources (20.4%), a Lack of student interest (41.7%), a Lack of teacher interest (29.6%) or difficulty understanding the material (26.9%) (Table 4).

In relation to the previously mentioned study (BACZEK et al., 2021), there was

an important difference in the allusion to Disadvantages because, in addition to technical computer problems, the lack of contact with patients was also mentioned as an important negative factor of the EER. This result is compatible with a study with undergraduate medical students in India who reported moderate satisfaction and usefulness with online classes, expressing a desire to resume routine face-to-face classes, mainly for practices and clinics (MENON et al., 2021).

The main advantages relative to face-to-face teaching were the presence of the teacher (62%), direct student-teacher interaction (67.6%), direct student-student interaction (81.5%) and more dynamic class (63%). The obligation of minimum attendance to pass the course was not considered an advantage by 75.9% of respondents.

The main disadvantages pointed out in face-to-face teaching were displacement (92.6%), being more tiring (71.3%) and the impossibility of re-presentation via video recording (52.8%). In addition, 66.7% of students responded that they would like the institution to offer courses remotely, while 70.4% would like to participate in discussion forums about clinical emergencies, and 74.1% thought that remote teaching could complement face-to-face activities. A previous study Yesilarly revealed that video-streamed classes and telehealth training for undergraduate students increases their technological fluency, which can be considered to optimize health learning curricula (SHAHRVINI et al., 2021). In a study carried out in Saudi Arabia (ALKHOWAILED et al., 2020), undergraduate medical students were satisfied with the change to the collaborative e-learning environment, with new successful procedures of virtual sessions, in which digital tools of learning facilitated their performance and knowledge sharing with their peers in active methodologies.



The EER has enabled the continuation of medical education during the pandemic. The use of this teaching modality can be integrated with the face-to-face modality after the health crisis to improve the effectiveness of medical education in the future and, therefore, hybrid formats can be used in the future. Dost et al. (2020) predict a greater incorporation of online teaching modalities in traditional medical education, accompanying changes observed in medical practice in virtual consultations. Ibrahim et al. (2020) even claim that there was a paradigm shift in medical education after the COVID-19 crisis.

Such evidence and ideas suggest that hybrid teaching could be evaluated in the learning of medical students, in future online theoretical courses, as well as the development of computer technologies even in clinical disciplines (AL-BALAS et al., 2020; NEUPANE et al., 2020). In addition, advances in technologies and distance learning is a new and rapidly growing approach for undergraduate, graduate and healthcare professionals, and may represent a solution to maintain learning processes in exceptional situations such as the COVID pandemic. -19. Thus, remote learning can be considered a viable alternative modality in academic institutions for undergraduate medical students.

## **CONCLUSIONS**

It is concluded that the appreciation of undergraduate medical students from a federal university regarding the disciplines of urgency and clinical emergencies taught under the EER modality during additional semesters at the beginning of the COVID-19 pandemic among white students and with ease internet access logistics, observing a lower frequency than expected in relation to the preference for face-to-face teaching for this type of essentially practical subject, with advantages and disadvantages in relation to

remote teaching. These results suggest that hybrid teaching could be evaluated in the learning of medical students.

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