

# Medical Emergencies teaching in Dentistry undergraduate courses in Southeastern Brazil

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**Aim:** The aim of this study is to offer an overview of the Medical Emergencies (ME) discipline offer in Dentistry graduations in southeastern Brazil and to observe the curricular characteristics of the discipline when present. **Methods:** This cross-sectional documentary study analyzed the available curricular frameworks in the official websites of Higher Education Institutions (HEI) in southeastern Brazil registered on the Ministry of Education's e-MEC website. The data were analyzed and tabulated using the GraphPad Prism 8.1.2 software, being described by absolute and relative frequencies. Fisher's exact test was used to compare the proportions between public and private institutions. **Results:** Of the 176 courses in the Southeast, 144 were included in the study for providing access to the curriculum, 19 (13.19%) were public and 125 (86.81%) were private. Only 27 (18.75%) of the HEI present the discipline of ME, with a greater tendency of supply in private HEIs (20.80%) when compared to public HEIs (5.26%), but this difference was not statistically significant ( $p > 0.05$ ). As a positive aspect, the discipline is predominantly mandatory (88.88%), and the with regard to the teaching methodology is predominantly theoretical (68.18%). The average workload is 50.14 hours ( $SD=19.54$ ). **Conclusions:** In only 18.75% of the dental institutions in Southeast Brazil, ME discipline were offered. When offered, the discipline is predominantly theoretical and mandatory. This study raises an important discussion regarding the need to include specific and mandatory subjects on ME in the dentistry curricula in Brazil and reflects the need to update and standardize the national curricular guidelines for dentistry.

**Keywords:** Education, dental. Emergency service, hospital. First aid. Dentistry.

## INTRODUCTION

Dental surgeons must be prepared to manage possible medical emergencies (ME) that may arise in their daily professional practices<sup>1,2</sup>. In such situations, professionals and their teams need to be confident and up to date with their skills in order to provide initial treatment of quality<sup>3</sup>. Despite the consensus on the importance of training dental surgeon in this subject, several national<sup>4-7</sup> and international studies<sup>8-14</sup> show unsatisfactory results by demonstrating low knowledge and confidence of professionals in managing ME and first aid.

Based on these aspects, in recent years there has been a change in medical emergency management teaching methodologies for undergraduate students in many developed countries as an attempt to improve their management outcomes<sup>15-20</sup>. Moreover, in some countries, emergency medical training is formally part of undergraduate dental programs, and the example is the United States, which has been offering the discipline since 1981<sup>21</sup>.

In Brazil, the Federal Council of Dentistry (CFO) determined that all specialization courses should include in their programs the discipline of Medical Emergency in Dentistry, with a minimum workload of 15 hours<sup>22</sup>. Arsati et al.<sup>4</sup> (2010) point out that it is unacceptable that this discipline is compulsory only for postgraduate programs, since any practitioner may face a medical emergency during clinical practice, regardless of their level of education and specialty. A national study has shown that Brazilian undergraduate dentistry students have only superficial knowledge about medical emergencies<sup>23</sup>. With this, the formation of a generalist dentist is compromised, bringing insecure and unprepared professionals to the Brazilian job market.

Although several studies assess the knowledge of students and professionals in the management of ME, few studies discuss the factors that contribute to the persistence of these unsatisfactory results. The poor approach of this content during graduation may be one of the reasons why dental surgeon dentists still demonstrate a low ability to manage ME. In addition, this study is also useful because there are no reports in the literature regarding the comparative assessment between the provision of the ME discipline from public and private Brazilian institutions. Therefore, the objective of this paper is to draw an overview of the insertion of the ME discipline in the dentistry graduations of southeastern Brazil, and observe the curricular characteristics of the discipline when present.

## MATERIALS AND METHODS

This is a cross-sectional and documentary evaluation study, in which the curricular matrices of the dentistry graduations were collected on the official institutional websites of the colleges, or via e-mail, through the coordinators of the dentistry courses. The search for discipline in the curricular matrices was carried out by two independent evaluators previously trained and calibrated. Information collected that differed between the two researchers was checked by a third evaluator.

The following variables were studied: location of institutions by states of the federation; HEI administrative category: public or private; insertion and offer of the

discipline: presence or absence; nature of the curricular component: mandatory or non-mandatory; teaching methodology: theoretical or theoretical-practical content and total workload.

The sample of this research consists of all dentistry schools located in the southeast region of the country in active situation in March 2019, registered in the e-MEC portal of the Ministry of Education and Culture<sup>24</sup> which is regulated by Normative Ordinance No. 21, of December 21, 2017.<sup>25</sup> The collection period of the curricular grids was from March to June 2019.

Institutions were excluded from the sample according to the following criteria: did not have an official website and did not provide virtual media; did not present their complete curriculum available; did not open the dentistry course; and did not answer the e-mail after waiting for a deadline of two months, in case of absence of the curriculum on the institutional website. The collection period of the curricular grids was from March to June 2019. As it is a documentary evaluation study in the public domain, the approval of the Ethics Committee is waived.

Different poles of the same institution were considered in the composition of the final show, as well as institutions that offered the dentistry course in more than one modality, whether morning, afternoon, night or full, were treated as independent data, since the curricular matrix may vary between these situations, even within the same institution.

The statistical software used to analyze the variables was GraphPad Prism 8.1.2 (GraphPad Software Inc., La Jolla, CA, USA), which was analyzed using descriptive statistics, absolute (n) and relative (%) frequency. The statistical test used for comparison was Fisher's Exact Test. The adopted significance level was 5%.

## RESULTS

We identified 176 dental schools, of which 32 were excluded for not meeting the study inclusion criteria; one did not have an official website and did not provide virtual means of communication; six did not open the course and 25 did not respond to the email after the two-month period. It was necessary to consult 33 HEIs via e-mail, obtaining a response rate of 24.24%. The final research sample consisted of 144 institutions (81.82%), 10 (6.94%) located in the state of Espírito Santo (ES), 51 (35.41%) in Minas Gerais (MG), 21 (14.58%) in Rio de Janeiro (RJ) and 62 (43.05%) in São Paulo (SP). According to the administrative category, Brazilian dental schools may be public or private. The sample of this study consisted of 125 (86.80%) private and 19 (13.19%) public schools.

Regarding the offer and insertion of the discipline, other names were found in the curriculum as "Basic life support" and "First Aid". In general, only 18.75% of the colleges offered the discipline in their pedagogical plans. For the variable nature of the discipline, out of the 27 institutions that provided this information, it was observed that discipline is compulsory in 88.88% of the courses, compared to 11.12% of institutions in which the discipline is optional. The prevalence of the discipline taking into account the nature of the institutions is described in Table 1.

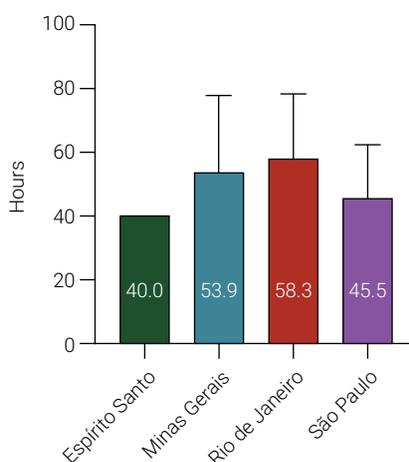
**Table 1.** Prevalence and association test of the discipline of Medical Emergencies according to the administrative nature of dental schools in southeastern Brazil, 2019.

Variables	n (%)		n (%) HIE public + HIE private	p-value (HIE public x HIE private)
	Administrative nature of dental schools			
	HIE public	HIE private		
<b>Insertion and Offer (n=144)</b>				0.1264
Present	1 (5.26%)	26 (20,0%)	27 (18.75%)	
Absent	18 (94.74%)	99 (79.20%)	117 (81.25%)	
<b>Nature of the discipline (n=27)</b>				>0.9999
Compulsory	1 (100.00%)	23 (88.46%)	24 (88.89%)	
Optional	0 (0.00%)	3 (11.54%)	3 (11.11%)	
<b>Teaching Methodology (n=22)</b>				0.3182
Exclusively theoretical contente	0 (0.00%)	15 (71.43%)	15 (68.18%)	
Conjugated practical methodologies	1 (100.00%)	6 (28.57%)	7 (31.82%)	

Absolute (n) and relative (%) frequency of ME subject to HEI administrative category. Fisher's exact test ( $p < 0.05$ ).

In private institutions, regarding teaching methodology, 22 institutions offered this information. In institutions which the discipline is only theoretical, four of them (26.66%) offer it in the Distance Learning modality (DL) and in 11 (73.33%), in the in-person modality. Only seven dental schools offer practical ME courses in their curriculum.

Regarding the workload, 21 courses offered this information in the curriculum matrices. The average workload was 50.14h (SD = 19.54). The workload per state of the federation is shown in Figure 1.A. Analyzing this variable according to the administrative category of the institutions, private schools had an average workload of 51.90h (SD = 18.27), while in public colleges the only school offering the subject had a workload of 15h. The minimum workload was 15h, and the maximum workload was 80h, with a median of 40h.

**Figure 1.** Average workload of the discipline of medical emergencies offered by dental schools by states of the federation (ES n = 3; MG n = 9; SP n = 6; RJ n = 3) in southeastern Brazil, 2019.

## DISCUSSION

ME management is of crucial importance in dentistry practice and the starting point of training in this area is the undergraduate course in Dentistry<sup>26</sup>. Nevertheless, the results of this study show that Brazilian dental schools are outdated in the teaching of ME, as most of the institutions surveyed (86.81%) fail to offer a specific subject-oriented discipline in their curriculum. Aggravating this picture, less than a third of institutions reserve practical content subjects in their curriculum matrices, although studies show that participation in hands-on training easily raises students' awareness of the importance of ME, as well as self-confidence in emergency management<sup>17,19</sup>. As a positive aspect, our study observed that in colleges that the discipline is offered, the tendency is to be mandatory, ensuring that all professionals trained in the institution had contact with the subject during graduation. According to our literature review, this is the first study to evaluate the supply of ME disciplines in a sample of dentistry courses in Brazil, as well as to compare how this discipline is distributed between public and private HEI.

In Brazil, the opinion of National Education Council / Higher Education Chamber nº 803/2018<sup>27</sup> that deals with the revision of the National Curriculum Guidelines of the undergraduate course in Dentistry in the country, defines "the emergency approach and the basic life support in case of accidents that compromise the life and the individual's health" among the essential curricular contents of the undergraduate course in Dentistry, within the Humanities and Social Sciences axis. In addition, Law 5,081 of August 24, 1966<sup>28</sup>, which regulates dental practice in Brazil, states that Brazilian dental surgeon can prescribe and apply emergency medication in the event of serious accidents that compromise the patient's life and health. Despite these guidelines and attributions, the discipline of ME is not described as compulsory to be included in the pedagogical projects of undergraduate courses, and it is up to the institution to choose whether or not to offer it in the curriculum matrices, as proposed by Law No. 9,394<sup>29</sup>, in its article 5329, which guarantees didactic autonomy to dentistry institutions.

Except in emergencies caused by trauma, dental surgeon can find almost all forms of ME in their offices, such as fluctuating consciousness, unconsciousness, chest pain-related problems, hypoglycemia, generalized seizure, and adverse drug reactions<sup>30</sup>. Therefore, dental professionals must be able to perform basic maneuvers in ME situations, both general practitioners and specialists, to ensure the health quality and integrity of patients, until they are able to receive specialized care. However, in emergency situations, it is common for a rescuer to go through a situation of panic or indecision, resulting in increased morbidity and mortality for the patient, given the potential delay in response time to intensive care<sup>31</sup> reflecting the need for good care subject training to assure that professionals are calm and secure to deal with the situation.

An Australian study<sup>32</sup> evaluated patients' perceptions of ME in Dentistry and their expectations for dental surgeon' management, noting high patient expectations regarding dentists' general medical knowledge. Nevertheless, many studies support the lack of preparation of students<sup>23,26,33-35</sup> and professionals<sup>4-14</sup> in managing ME, concluding that the subject should be addressed more deeply in dental education<sup>11,23</sup>, and for graduate dentists, refresher courses and workshops should be more frequently considered<sup>9</sup>.

In this present study noted that few institutions offer practical content in ME disciplines, which does not seem to follow the trend in developed countries, where courses are moving away from just didactic-theoretical instruction, and incorporating regular practical simulation training into the provision of education<sup>15,16,18,19</sup>. These exercises help dental professionals and staff to feel more confident in their duties during emergency situations, improving their level of knowledge and overall readiness<sup>15-17,19</sup>. The use of simulators can be expensive as it may require the purchase of various mannequins and advanced life support simulators, but the skill acquisition level and positive student feedback seem to justify this expense<sup>18</sup>. Therefore, the existence of a specific theoretical-practical discipline in undergraduate studies is essential for the preparation of future professionals to lead with ME. The course introduces the student to a weekly experience on the subject, allowing him to perform regular emergency exercises to reinforce learning.

A US study published in 2018<sup>2</sup> assessed the knowledge and preparation of professionals, skilled residents, and faculty members. It has observed that participants who had recently graduated or were still in school were able to treat ME cases more appropriately and often than the other participants. This finding positions the dental school as a valuable component in the preparation of clinicians. The authors also proposed the incorporation of periodic emergency exercises in dental settings, along with continuing education courses, to help dental surgeon manage ME.

A national study<sup>4</sup> of 498 professionals found that Brazilian dental surgeon are not fully prepared to manage ME, as only 41% of dental surgeon thought they could diagnose the cause of ME, and most felt unable to treat situations of anaphylaxis, myocardial infarction or cardiac arrest, or dealing with cardiopulmonary resuscitation procedures and intravenous injection. Another important finding of the study is that the most common justifications for lack of knowledge and skills were lack of training and updating during and after the undergraduate course.

Despite geographical differences and variability in dental curricula around the world, studies show that students and practitioners have expressed their intention to improve their specific set of ME management skills<sup>5,34</sup>. We believe that undergraduate dentistry courses should be reviewed to make it mandatory to include ME in their curricula, and that this agenda should be raised by the Brazilian Association of Dental Education (ABENO). Likewise, upon graduation, all trained professionals, regardless of whether they are specialists, should be encouraged to take regular CFO-regulated theoretical and practical courses in the field, and more severely in the future become mandatory for record keeping from the board.

A limitation of this study is the impossibility of identifying institutions that offer subject-oriented extracurricular projects related to the subject. Another limitation is to have evaluated and included only disciplinary `by name`, but that the content could be approached in a theoretical or theoretical-practical way within another discipline, such as physiology, pharmacology and surgery, which can generate a possible analysis bias. However, it was not the objective at this time and due to the difficulty of accessing all menus for this type of evaluation. One suggestion is that future studies conduct an assessment based on semi-structured questionnaires sent to course coordinators to obtain additional information related to the prepa-

ration of dental schools to respond to medical emergencies. The HEI exclusion criteria adopted in this study culminated in an inclusion rate of 81.8% of institutions in southeastern Brazil. Therefore, the results discussed here reflect the reality of most HEIs in this region, but they should not be generalized as the real situation of teaching ME.

The evaluation of higher education curricula and discussions that lead to curricular changes are essential to achieve excellence in teaching<sup>35-38</sup>. It is important that the curricula of undergraduate courses in Dentistry are reviewed to make it mandatory to include this discipline, in order to improve knowledge and practice in ME, providing the skills that will allow a well trained professional to attend the needs of the patients. This need should be discussed by the ABENO and by the CFO, in order to formulate a consensus document that guides the HEI in future curricular reformulations, such as fundamental program content, minimum workload, offer period, nature of the discipline and methodologies of teaching ideas.

In conclusion, this study observed the current panorama of the supply of the discipline of medical emergencies in dentistry courses, and observed that dental schools in southeastern Brazil, both public and private, are outdated in the curriculum, since most HEIs do not offer the discipline (81.25%). In addition to the low supply of the discipline, in most institutions the discipline is only theoretical. It is also noteworthy that, within the theoretical modality, more than a quarter of the HEIs offer the discipline in the distance learning modality, which can raise questions about the quality of practical teaching. As a positive point, it was observed that when offered the nature of the discipline is predominantly mandatory.

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