

**Evaluation of undergraduate dentistry students' knowledge on medical emergencies:  
an integrative review****Avaliação do conhecimento dos graduandos em odontologia sobre emergências  
médicas: uma revisão integrativa****Evaluación del conocimiento de estudiantes de odontología sobre emergencias  
médicas: una revisión integradora****Received: 13/08/2020****Approved: 11/03/2021****Published: 21/06/2021****Júlia Tavares Palmeira<sup>1</sup>****Vitor Nascimento Goes<sup>2</sup>****Yunes Araújo Silva<sup>3</sup>****Ismael Lima Silva<sup>4</sup>****Layla Beatriz Barroso de Alencar<sup>5</sup>****Ana Karina Almeida Rolim<sup>6</sup>**

This is an integrative review that considered the period from the beginning of 2015 to the beginning of 2020, carried out in mid-2020. It aimed to review the productions about academical knowledge in Dentistry in emergency situations. The PubMed, Medline and Scielo databases were chosen using descriptors, separately or in combination: medical emergencies, dentists and dentistry emergencies. Eleven original articles were included, nine of which stated that undergraduates do not feel confident and/or have theoretical-practical mastery of emergencies and only two stated the opposite. This study shows a small number of productions related to the assessment of the knowledge of undergraduate dentistry students about medical emergencies. This fact shows how the theme is still little addressed in the training and practice of dental surgeons.

**Descriptors:** Dentistry; Education, Dental; Emergencies.

Esta é uma revisão integrativa que considerou o período de início de 2015 a início de 2020, realizada em meados de 2020, com o objetivo de revisar as produções acerca do conhecimento de acadêmicos em odontologia frente a situações emergenciais. Elegeu-se as bases de dados PubMed, Medline e Scielo utilizando descritores, de forma isolada ou combinada: emergências médicas, cirurgões-dentistas e emergências em odontologia. Foram incluídos 11 artigos originais, dos quais nove afirmaram que os graduandos não se sentem confiantes e/ou possuem domínio teórico-prático sobre emergências e apenas dois afirmaram o contrário. Este estudo mostra um número reduzido de produções relacionadas à avaliação do conhecimento dos graduandos em odontologia sobre emergências médicas. Tal fato evidencia o quanto a temática ainda é pouco abordada na formação e prática do cirurgião-dentista.

**Descritores:** Odontologia; Educação em odontologia; Emergências.

Esta es una revisión integradora que consideró el período comprendido entre principios de 2015 y principios de 2020, realizada a mediados del mismo año, con el objetivo de revisar las producciones sobre los conocimientos de estudiantes de odontología acerca de situaciones de emergencia. Las bases de datos PubMed, Medline y Scielo se seleccionaron utilizando los descriptores, solos o combinados: emergencias médicas, cirujanos dentistas y emergencias en odontología. Se incluyeron 11 artículos originales, de los cuales nueve afirmaron que los estudiantes de grado no se sienten seguros y/o tienen dominio teórico y práctico sobre las emergencias y sólo dos afirmaban lo contrario. Este estudio muestra un número reducido de producciones relacionadas con la evaluación de los conocimientos de los estudiantes de odontología sobre las emergencias médicas. Este hecho demuestra lo poco que se aborda el tema en la formación y la práctica del cirujano dentista.

**Descriptores:** Odontología; Educación en odontología; Urgencias médicas.

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## INTRODUCTION

The word emergency comes from the Latin *emergentia*, which can be translated as “critical”, “serious” or “dangerous situations”, in which the life or well-being of someone is at risk<sup>1-3</sup>. In dentistry, some factors have contributed to these incidents occurring more frequently in recent years, such as: the increase in life expectancy and the prevalence of systemic diseases, which consequently influence the number of elderly and systemically compromised people in the search for dental treatment<sup>4,5</sup>.

Emergencies range from less serious complications such as syncope and lipothymia, to those with imminent risk of death, such as cardiorespiratory arrest<sup>6-9</sup>. During anamnesis and clinical care, there must be extra attention to neurological, endocrine, immunological, respiratory and cardiovascular disorders that the patient may have<sup>10-12</sup>.

In a medical emergency, dental surgeons do not have the obligation of results, but of means, that is, they must provide initial first aid care and provide basic assistance until health professionals responsible for emergency care arrive at the site. It is evident that dentists, when using their knowledge, techniques and materials necessary to intervene in a medical complication, will be fulfilling their role as health professionals in offering their services to those who need it<sup>13-15</sup>.

Recent data show that most dentistry professionals do not feel self-assured and capable of correctly attending to an emergency, thus becoming dependent on the medical presence to help the patient<sup>15</sup>. If a dentist is not prepared to deal with an emergency situation, the chances of the patient suffering further damage or even death increase. The proper preparation of these professionals makes them able to act more efficiently in these situations<sup>16,17</sup>.

In emergency situations, dentists have civil, criminal, administrative and ethical obligations to provide immediate support and care, and in the event of a harmful result to the patient during an emergency, they will have the duty to repair the damage and indemnify the patient, in accordance with the penalties of the Brazilian Civil Code<sup>18</sup>.

Basic Life Support (BLS) maneuvers are not the domain of only health professionals, they can be performed by anyone, as long as they are trained and qualified for this function<sup>5</sup>. Even so, the subject is little discussed in universities, more precisely, in courses in the health area, which results in insecurity among academics from the most diverse courses when providing first aid<sup>19</sup>.

A first contact with emergency situations while still in graduation is an alternative to boost the number of professionals qualified for emergency care in the dental clinic in a practical and safe way. In addition, through knowledge acquired with the discipline, the future dentist becomes capable not only of solving emergencies in dentistry but also of saving lives in a medical emergency situation<sup>20,21</sup>.

Thus, the aim of this study was to review studies about the knowledge of academic dentistry in face of emergency situations.

## METHODS

This is an integrative review on the assessment of undergraduate dentistry knowledge about medical-emergency situations using the following question as the main challenge: "Do undergraduates have the proper knowledge/training and do they feel safe to intervene in medical emergencies in a dental clinic?" .

The search for articles was developed in a virtual and systematic way, in the PubMed, Medline and Scielo databases, in isolation or in combination, using the following descriptors: “*emergências médicas*” (medical emergencies), “*graduandos em odontologia*” (undergraduates in dentistry), “*emergências*” (emergencies) and “*emergências em odontologia*” (emergencies in dentistry), carried out in March, 2020 to June 2020, considering the last five years (from 2015 to early 2020)

As inclusion criteria: study fully available online, research developed only with undergraduate dentistry students, written in Portuguese or English. Duplicate articles were excluded, keeping only one version in the first base consulted.

Initially, the articles found in the search were selected based on the reading of titles and abstracts, and those that already contained in these two criteria a clear relationship with the theme and proposed objective were chosen. Subsequently, the selected articles were searched in full.

Articles that fit the theme were selected for full reading and from this stage, those that did not fit the theme were excluded. Then, data extraction from the selected articles was performed through the complete reading, so that the relevant information could be evaluated with greater precision.

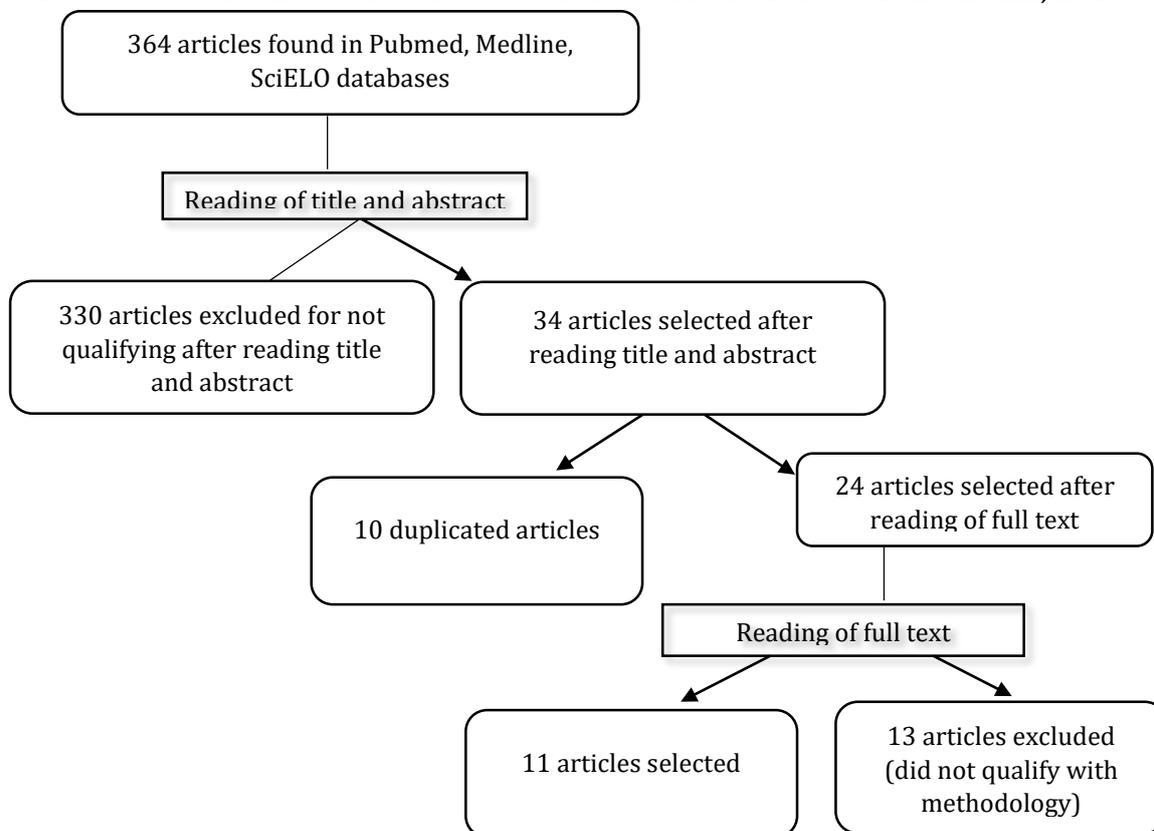
The analysis and preparation of the results found in the included studies were presented in a descriptive way. A table was created in order to organize and compile the main data related to the articles, forming a database that is easy to access and manage. The table includes the following items: title, main author, year, place of study, sample size, period of publication, objective and results.

This study did not require submission and approval by the Research Ethics Committee, since the articles manipulated are freely accessible and did not have confidential data. The other ethical aspects were not violated, as all the articles used were duly referenced.

## RESULTS

Of the 364 articles initially surveyed, 11 original articles were considered, as shown in Figure 1. Of the 11 articles included, nine of these stated that undergraduates did not feel confident and/or had theoretical-practical domain about emergencies and only two 2 stated the opposite (Table 1).

**Figure 1.** Flowchart and number of articles considered from 2015 to 2020. Brazil, 2020.



**Table 1.** Studies carried out with dentistry students and their relationship with the topic of medical emergencies between 2015 and 2020. Brazil, 2020.

No.	Article's Title	Author/Year/Place	Sample Size	Purpose	Results
1	Evaluation of Dental Students' Perception about Medical Emergencies	Gomes <i>et al.</i> (2020) <sup>15</sup> Paraíba-Brazil	138 students	Assess the level of perception of Dentistry students regarding the main dental emergencies.	88.4% of respondents reported that they felt unprepared to deal with an emergency situation.
2	Knowledge level of basic life support among dentistry students	Campos <i>et al.</i> (2019) <sup>17</sup> Minas Gerais - Brazil	126 students	Identify the level of knowledge in basic life support of students in the Dentistry course at the headquarters of the Universidade Federal de f Juiz de Fora.	82.5% of dentistry students had an unsatisfactory level of knowledge about acting in the SBV.
3	Analysis of the knowledge of Unifeso's dental students on ethical and legal aspects of medical emergencies in dentistry	Pereira <i>et al.</i> (2019) <sup>18</sup> Rio de Janeiro - Brazil	84 students	Evaluate the perception of dentistry students in the fourth and fifth years of Unifeso about medical emergencies in dentistry and their ethical and legal implications, as well as verifying whether students are able to deal with these complications.	54% of fourth and fifth year students at this institution have never had training in BLS, demonstrating that most of them are not able to deal with medical complications.
4	<i>Emergências Médicas em odontologia: Avaliação do conhecimento dos acadêmicos</i> (Medical Emergencies in Dentistry: Assessment of Academic Knowledge)	Silva <i>et al.</i> (2018) <sup>22</sup> Paraíba- Brazil	66 students	Search whether dentistry academics from the last four semesters of the course have the proper knowledge and if they feel prepared to promote a correct intervention in the case of emergencies and medical emergencies in the office dental care.	86% of students do not they feel capable to apply the basic maneuvers of life.
5	Preparedness of Dental students to Manage Medical Emergencies in Clinical Dental Set-up: A Cross-sectional Questionnaire survey	Nishtha <i>et al.</i> (2018) <sup>23</sup> India	147 students	Evaluate the preparation of dentistry students to manage medical emergencies in dental clinics	75% of survey participants did not feel confident about intervening in any medical emergency.

6	Knowledge level of basic life support among dentistry students	Albelaihi et al. (2017) <sup>11</sup> Saudi Arabia	153 students	Investigate and assess knowledge, attitude and perceived confidence of dental students and interns in managing medical emergencies.	63% of survey participants did not have confidence in the treatment of medical emergencies, in addition, they had low knowledge on the subject.
7	The Competence of dental staff and students to deal with medical emergencies at UQUDENT	Alkhater & Al-Harthy (2017) <sup>12</sup> Saudi Arabia	162 students	Investigate the skills of dentistry students facing medical emergencies.	71.2% of students felt safe to manage a medical emergency.
8	Training study of undergraduate dentistry students in a public institution of Espírito Santo face to medical urgencies/emergencies	Mutz <i>et al.</i> (2017) <sup>24</sup> Espírito Santo - Brasil	140 students	To evaluate the knowledge and confidence of undergraduate dentistry students in the clinical phase about emergencies in a public institution of higher education in the state of Espírito Santo.	88.57% of students do not feel safe to intervene in a medical emergency
9	Knowledge, attitude and anxiety pertaining to basic life support and medical emergencies among dental interns in Mangalore City, India	Somaraj et al. (2017) <sup>19</sup> Índia	183 students	Assess knowledge, attitude and anxiety regarding basic life support and medical emergencies among interns at dental schools in the city of Mangalore, Karnataka, India.	98.36% feel insecure about acting in a medical emergency.
10	Knowledge and attitude of general dentists and last-year students regarding the management of medically compromised patients in Shiraz, Iran	Ghapanchi <i>et al.</i> (2016) <sup>16</sup> Irã	68 students	Analyze the level of dentists and dental students on systemic disease management and medical emergencies in Shiraz, Iran.	65 students (95.58%) claimed to have good knowledge of the subject and only 3 (4.42%) reported understanding moderately
11	Medical emergency in dental practice: occurrence, equipments and drugs, professional expertise and training of the clinicians	Ahamed <i>et al.</i> (2016) <sup>13</sup> India	100 students	Assess the perceived level of competence and knowledge among dental students in handling medical emergencies.	Only 40% of dental students said they were safe to intervene in emergencies.

## DISCUSSION

Prior knowledge of systemic diseases is of paramount importance to avoid medical emergencies in dental patients. Anamnesis should not be neglected, as it is through it that adverse health conditions and pathologies relevant to dental treatment are investigated<sup>23</sup>. In addition to supporting the dental diagnosis, anamnesis is important to reveal complications, as well as unpleasant situations experienced by the patient in previous treatments, to avoid recurrences.

Generally, anamnesis is the main complaint, which represents the reason that led the patient to the appointment, and the description of the medical and dental history, which allows the identification of systemic and chronic diseases, previously identified allergies, medications used by the patient, among others<sup>25</sup>.

Among the most common urgencies and/or medical emergencies that occur in the dental office, syncope, seizures, allergic reaction, airway obstruction, hypoglycemia, cardiovascular emergencies and asthma attacks stand out. In addition, 75% of cases of medical urgencies and emergencies in the office are caused by stress and fear<sup>26</sup>.

Dental students and professionals in the field, to work in the profession, must assume responsibilities that go beyond dental treatment. Dental surgeons should be aware that, by restricting their performance to the oral cavity only, without respecting their patient's general health status, they may be significantly increasing the chances of an emergency event occurring<sup>25-27</sup>.

It is extremely important that dentists are able to perform basic maneuvers in the occasion of certain complications, to ensure their patients' health and integrity, until they can receive specialized care<sup>28,29</sup>. An interesting point is that studies carried out in countries such as India and Saudi Arabia, most of the students evaluated do not have the proper training within higher education institutions, they do not seek to complement the knowledge in other available alternatives.

During graduation, the issue of emergency in a dental office is little discussed, consequently there is a deficiency on the subject and unpreparedness for an emergency situation. Corroborating these studies, this review also presents a worrying result, since of the 11 articles included in the review, 7 (63.6%) stated that undergraduate dentistry students do not feel confident in intervening in an emergency medical situation in an outpatient setting and only 4 (36.4%) said they felt capable enough. This highlights the need to implement courses that address the subject of medical emergencies that are mandatory and components of the Pedagogical Course Project (PCP) of dentistry courses.

In a study that aimed to analyze the colleges in Northeastern Brazil that offered the course of medical emergencies in their syllabus, it was observed that of the 86 schools analyzed, only 14 (16.7%) offered the course of medical emergencies to their students, 9 (64.28%) being mandatory and 5 (42.85%) being elective, thus reflecting the need not only to expand the offer of the courses among colleges, but also to make them mandatory, given its importance that it has for the training of undergraduates in Dentistry<sup>28</sup>.

Also in this study, it was possible to observe that 9 (81.8%) of the studies that affirm the insecurity of the dentist in medical emergencies, this is attributed to a lack of knowledge in an academic environment<sup>28</sup>. These data highlight that the professional is poorly prepared to deal with an emergency medical situation during graduation, and the search for such knowledge is his own responsibility.

As there is no mandatory requirement for teaching the course of medical emergencies in most dentistry courses in Brazil, the future dental surgeon graduates without technical-scientific knowledge to deal with emergency situations. Consequently, this can still be held responsible for risks to the patient's life<sup>29</sup>. In addition, it is possible to see that the 2 (27.2%) articles that show that undergraduates have mastery/safety in a medical emergency are with students from other countries, to implement this course more vigorously in Brazil.

In the studies surveyed, it was found that the undergraduate in dentistry is not properly prepared to work in medical emergencies. It is also evident that many universities do not provide this type of knowledge, as a course, in the academic environment, dentists feel insecure in intervening in emergency situations.

## CONCLUSION

This study shows a small number of productions related to the assessment of the knowledge of undergraduate dentistry students about medical emergencies. This fact shows how the theme is still poorly addressed, even in view of its great relevance in all medical and dental aspects.

Among the limitations of the study, neither the methodological quality nor the research method of the studies included in this review were analyzed, which may compromise the inferences made. On the other hand, this review shows the need for new studies that investigate the knowledge of academics in dentistry about medical emergencies and that the topic is addressed more emphatically in dentistry courses in this country.

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#### CONTRIBUTIONS

**Júlia Tavares Palmeira** and **Ana Beatriz Rodrigues Moura** contributed to the writing. **Vitor Nascimento Goes** participated in the data collection and analysis. **Ismael Lima Silva** and **Layla Beatriz Barroso de Alencar** worked on the conception. **Ana Karina Almeida Rolim** collaborated in reviewing.

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