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Forensic dentistry: a systematic review

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Abstract

Introduction: It was verified that the identifications carried out by forensic dentists in mass disasters reach about 70% of the identifications in the world. With the population increase in recent decades, mass disasters have increased, both in natural catastrophes and by anthropic action, making it imperative to increase the numbers of forensic identification methods, to accelerate the recognition of fatal victims and the teeth are the only elements that can be used for identification. **Objective:** It was to highlight the importance of professional specialist in forensic dentistry and their diligence in the investigative process, to increase the diligence of greater richness of details and optimized work for the recognition of the bodies. **Methods:** The systematic review rules of the PRISMA Platform were followed. The search was carried out from February to April 2023 in the Scopus, PubMed, Science Direct, Scielo, and Google Scholar databases, using articles with different dates up to 2022. The quality of the studies was based on the GRADE instrument and the risk of bias was analyzed accordingly, according to the Cochrane instrument. **Results and Conclusion:** A total of 119 articles were found, 38 articles were evaluated and 32 were included and developed in this systematic review study. Considering the Cochrane tool for risk of bias, the overall assessment resulted in 28 studies with a high risk of bias and 32 studies that did not meet GRADE. the function of the forensic dentist in investigations of charred victims is notorious. The analysis performed by a professional with specific training in the field of dentistry is essential, and the importance of medical records, photographs, and radiographs for proper identification must also be considered. However, it is necessary to increase and improve the activities of forensic dentists in the work of recognition of charred bodies, being imperative to a set of factors for the elucidation of cases so that the identifications are complete. It is concluded that it is necessary to use several methods to optimize the practice of forensic dentistry, from cases of identification through the oral cavity, which was the beginning of the history of forensic identification in the field of dentistry, to the nowadays, its rise in history was analyzed for an effective elucidation of recognition of charred bodies.

Keywords: Forensic dentistry. Legal dentistry. Mass Accidents. Forensic dentist.

Introduction

Since ancient history, society has already been concerned with identifying the dead properly, thus developing various techniques to individualize human characteristics [1]. With the population increase in recent decades, mass disasters have increased, both in natural catastrophes and by human action, making it imperative to increase the numbers of forensic identification methods, to accelerate the recognition of fatal victims and, in most cases, the teeth are the only elements that can be used in identification [1,2].

It was verified that the identifications carried out by forensic dentists in mass disasters reach about 70% of the identifications in the world [3]. Thus, dental identification is a method with a long tradition and efficiency among the identification techniques used in catastrophic situations, especially in cases where destruction, fragmentation, and/or carbonization of bodies predominate, given that there is an extensive international sample [2,3].

In this context, the function of the forensic dentist in investigations of charred victims is notorious. The analysis performed by a professional with specific training in the field of dentistry is essential, and the importance of medical records, photographs, and radiographs for proper identification should also be considered [4]. However, it is necessary to increase and improve the activities of forensic dentists in the work of recognition of charred bodies, being imperative to a set of factors for the elucidation of cases so that the identifications are complete [5,6].

The first case of identifying Forensic dentistry in a mass disaster was reported by the literature on May 4, 1897, in Paris, with more than 200 deaths, 40 of which were left unidentified. The identification process carried out with the 126 victims of the fire was presented, performing a thorough examination of the oral cavity, and carefully describing the characteristics found in the corpses [3].

Another case reported another historical fact that occurred in 1909, among them a fire of doubt beginning in the Consulate of the German Legation in Chile [3]. In Brazil, as Arbenz reports (1959), the teaching of Forensic Dentistry was instituted in 1931, together with that of Hygiene, according to Articles 218, 219, and 311 of Decree No. 19,852, of April 11th. Currently, following Law 5081, through the Consolidation of Norms for Procedures in Dental Councils, approved by Resolution CFO 063/05, Forensic Dentistry is part of its specialties [7].

Other important incidents for forensic dentistry were the terrorist attack of September 11, 2001, on the World Trade Center in the USA, SPAIN, MADRID, March 11, 2004, with 10 almost simultaneous explosions with more than 191 people dead. BRAZIL, September 29, 2006: On September 29, 2006, a Boeing 737-800 SFP (Short Field Performance) of the Brazilian company Gol Transportes Aéreos, prefix PR-GTD, with 154 people on board. BRAZIL, July 17, 2007. TAM Airbus A320, flight 3054 There were 187 people on board. BRAZIL, May 31, 2009: Air France flight 447, with 228 people on board. Only 50 bodies were found, of which 11 were identified by dactyloscopy, 10 by DNA, and 20 by forensic dentistry [3,7,8].

Because of this, the present systematic review aimed to highlight the importance of the professional specialist in forensic dentistry and their diligence in the investigative process, to increase the diligence of greater detail and optimized work for the recognition of bodies.

Methods

Study Design

This was followed by a systematic literature review model, according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) rules. Available in: http://prisma-statement.org/?AspxAutoDetectCookieSupport=1. Accessed in: 04/20/2023.

Data sources and research strategy

The literary search process was carried out from February to April 2023 and was developed based on Scopus, PubMed, Science Direct, Scielo, and Google Scholar, using articles with different dates up to 2022, using the descriptors (MeSH Terms): and using the Booleans "and" between the descriptors (MeSH Terms) and "or" between the historical findings

Study Quality and Risk of Bias

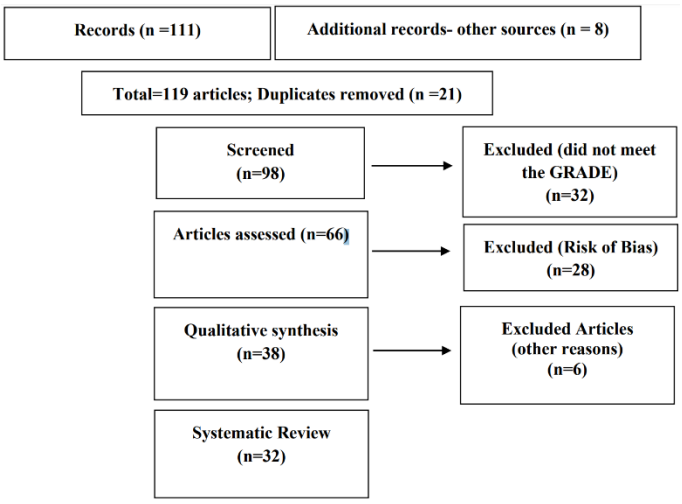
The quality of the studies was based on the GRADE instrument. The risk of bias was analyzed according to the Cochrane instrument.

Results

Summary of Literary Findings

A total of 119 articles were found. Initially, duplication of articles was excluded. After this process, the abstracts were evaluated and a new exclusion was performed, removing the articles that did not include the theme of this article, resulting in 98 articles. A total of 38 articles were evaluated and 32 were included and developed in this systematic review study (Figure 1). Considering the Cochrane tool for risk of bias, the overall assessment resulted in 28 studies with a high risk of bias and 32 studies that did not meet GRADE.

Figure 1. Selection of studies.



Legal Aspects - Expertise and Dentistry

The attributions of the Dental Surgeon were defined by Law 5081 of 1966, including in the expert area, and also regulates the practice of dentistry

throughout the national territory [7-9]. This law is expressed in its 6th article, IV - Proceed with legal dental expertise in civil, criminal, labor, and administrative jurisdictions, IX - Use, in the exercise of the role of Dental Expert, in cases of necropsy, the neck, and head access routes [10].

The performance of the forensic dentist is regulated by articles 63 and 64 of Resolution CFO – 63/2005, which is entitled "Consolidation of norms for procedures in Dental Councils". [11]. The dental surgeon can act in criminal investigations as long as he is requested and has adequate knowledge to perform the function of an expert [1-4].

According to Almeida Júnior, an expert is a person who performs technical examinations of his specialty or competence to clarify facts that are the subject of a police investigation or judicial process [12]. So, the forensic dentist is in charge of serving as an auxiliary of justice, clarifying specific points far from the magistrate's legal knowledge [13].

Moreover, forensic dentists must have specific biological knowledge and notions of legal thinking, since they help in a judicial decision and their report can determine the resolution of a case [14]. However, the performance of the forensic dentist is limited, as he does not judge, does not defend, or accuse. You have to examine and report the facts necessary to clarify a case. Experts can be official and unofficial [3]. Forensic dentists carry out the corpus delicti examinations and other required expertise, being responsible for the examinations, preparation, and signing of the corresponding reports. Non-official experts are those appointed to fill the gap of official experts or to replace them, when, for any reason, they are prevented or unable to work [15].

In addition to understanding the rights and duties of forensic dentists, expertise is the set of medical/dental and technical procedures whose purpose is to clarify a fact of interest to justice [3,15]. Legal medical-dental expertise consists of procedures that help justice, to produce evidence that will be materialized with the report. The dental surgeon can act in these cases, helping to clarify the facts, and elucidating the materiality, dynamics, and authorship of the crime [1,16].

Still, the forensic dentist must, in the expertise, use the head and neck pathways and make notes, drawings, diagrams, photographs, and everything necessary for the examination to be well described [2,13]. Ideally, further clarification is not necessary, through a second examination with the body already in composition or skeletonized, as it will not bring the same information. The examination of the cadaver begins by analyzing the extra-oral characteristics. Then, possible debris found in the oral cavity must be eliminated. The intra-oral examination is then performed, observing the anatomical and physiological conditions [17,18].

In the intra-oral examination, the professional must use protective clothing, dental instruments, impression material, material for data recording, and a camera, to collect all the necessary information. Often, however, adequate access to the oral cavity becomes difficult and compromised [19]. Therefore, in some cases, it is recommended to remove the jaws to perform an oral autopsy, thus allowing the preservation of the teeth, improving the visualization of the oral cavity, and facilitating the realization of radiographs [1,2].

All information obtained in the dental examination must be registered in a specific odontogram, preferably in an international model, to allow the exchange of data between countries. Dental expertise is of great importance in cases where there are charred and mutilated bodies [20].

Mass Disasters

The mass disaster results in a high number of victims, impacting emergency health services. The most common characteristics arising from mass disasters can be cited as great social repercussions, intense work by the media, commotion and emotional involvement of the community, great destruction with trauma to people and homes or apartments, difficulties or even impossibility of identification mainly when the victims are of different nationalities [21].

Also, some authors have highlighted some specific characteristics of aeronautical accidents, the injuries are serious due to the impact, the burning of aircraft fuel, and the great dispersion of parts of bodies and objects [2,3,21,22]. In addition, aeronautical accident affects society when it occurs, in addition to causing physical damage to the people on board and material damage, both with economic consequences [23].

In addition, the conditions of the bodies collected at the IML, after an aircraft crash, were described in terms of the action of the fire, with the majority having partial (49 cases) or total (8 cases) or almost total charring (31 cases). Thirty-three cadavers with partial charring had more than 50% charred body surface. Ten bodies were not charred, but 6 cases had other degrees of temperature. The same occurred in the air disaster in Sainte-Odile (France), in 1992, highlighting the importance of the forensic dentist in the operation [24].

Human Identification Methods After Carbonization

General aspects

Human identification is the process by which a person's identity is determined, with dental analysis being the most used method, concomitantly with other

biological parameters, such as papilloscopic analysis, iris analysis, and genetic analysis. The conditions in which the person's body is found determine the methodology to be employed [3,8].

Dental identification can be carried out on corpses in a state of putrefaction, when there is no fingerprint identification, in major catastrophes, in cases of body tearing, and anthropological investigations. Therefore, the importance of establishing identity through the study of the signal characters present in the teeth is emphasized, due to the countless combinations of restorations, prostheses, missing teeth, and caries, among others, which can involve 160 dental surfaces [1-3].

Besides, one should take into account the shape of the restorations, endodontic treatments, and the anatomical characteristics of the teeth and periodontal tissues, in addition to the dental radiographic examination. The same author urged on the importance of the quality of the record of odontogram in life and stated that the dental surgeon must keep the medical record updated [25,26].

Also, an identification process to be applied must meet five technical requirements, such as Uniqueness, Immutability, Perenniality (Persistence), Practicality, and Classification. Therefore, the identification of charred, putrefied, or skeletonized corpses, through dental characteristics, can be classified as a comparative methodology, as it confronts information obtained from antemortem documentation with data collected post-mortem and is divided into three stages: an examination of the cadaver's dental arches, examination of dental documentation and legal dental check [4,5].

In this way, the first phase involves the analysis of all the dental particularities present in the remaining teeth and in the other structures of the oral and maxillofacial complex, related to the presence or absence of teeth, caries, restorations, endodontic treatments, prostheses, anomalies, rotations, and crowding. In the dental dossier, all information relevant to the treatment carried out, which was noted by the clinician in the dental record, is added, associating and comparing them to the information analyzed in the complementary exams (radiographs, photographs, models, among others) [3,5,6].

The last stage is the comparison of the data obtained in the first two, considering the same reference point and based on a qualitative and quantitative analysis of the evidenced dental particularities. The results of the comparison of antemortem and post-mortem lead to the following four situations, identification, and presumptive identification, however, information from both sources may be insufficient, insufficient evidence for identification, and exclusion of identification evidence [18,26].

To corroborate the findings in the present study, the authors studied a lot about carbonization, leaving an important legacy for the understanding and development of forensic dentistry. According to these authors, carbonization has the general effect of condensing tissues, reducing their volume in such a way that each member, each organ, taken separately, is diminished and the body as a whole is reduced to singular proportions. For example, the head and body of an adult of normal height look like a 12-year-old; teeth and bones are very resistant to the action of heat, but can be partially destroyed or become brittle; the body has the upper limbs raised, and the fingers at war [11,12].

Estimation of Height by Teeth

A mathematical equation was developed to apply using the dental arch, more precisely the central incisors, lateral incisors, and lower canines, the height of the cadaver can be estimated through the teeth. Thus, through a simple calculation, it would be possible to determine a minimum height and maximum height of a certain individual, just by these elements [3].

After that, Cavalcanti, Porto, and Melo (2007) [27] improved the studies and carried out a study with fifty students who were selected and submitted to anthropometric measurement and molding of the lower arch to obtain the study model, in which the formulas were applied de Carrea to obtain the estimated height of each one, using Carrea's method, with 49 calipers and millimeter tape, and the method modified by the authors, with dry point compass and ruler. The central and lateral incisors and the lower canine on both sides, right and left, were measured. By Carrea's method, only 36% coincided for the right side and 48% for the left, and in his method the coincidence was 96% for both sides, showing that the modified method was more effective than Carrea's.

Identification by Dental Arcade

No two people have the same dental arches, as their configuration is unique; constructed concomitantly with physical, emotional, and mental development. Precisely because each dental arch is a photograph of this individual development. Teeth, together with restorative materials, after being exposed to heat, are still a great means of identification due to the high durability of these materials and dental elements, and he also reports that the data obtained are very similar to those found in dental arches of individuals. charred and allow the expert to determine the type of restorative material used by comparison [3,4].

Such information associated with data from the confrontation of documentation produced in life will allow the establishment of the corpse's identity. Therefore, examining a body through the mouth and dental arches can be fundamental in a criminal investigation, since teeth are highly resistant structures and provide individual information that can help in investigations [4].

DNA Analysis

DNA testing is a highly reliable method, but it has some limitations, such as high cost, the possibility of degradation, and difficulty in locating the victims' close relatives. Dactyloscopy is another effective and widely used method; however, in some situations, fingerprint data are not available at the place where the crime occurred, or fingerprints may be destroyed by putrefaction or carbonization, making identification unfeasible. Thus, the DNA test is the best indication [3,28].

After the charring of the victim's body, because it is subject to decomposition, fragmentation, incineration, or the lack of antemortem comparative data, traditional anthropometric methods often have their use limited or even impossible. Thus, DNA analysis presents good feasibility results, as a tissue fragment, mainly hard tissues such as bone and teeth, can potentially be identified [1,3,28].

Palatal Rugoscopy

Palatal rugoscopy was studied by the author Gomes (2012) [29], who established the criteria of "palatal rugae stenography". The oral mucosa, for the most part, is smooth to facilitate its function, and the portion that covers the anterior third of the palate is fixed and corrugated by a veritable system of folds or wrinkles, strongly adhered to the underlying bone plane, originating from the dense connective tissue of the submucosa, strongly fibrous, which covers the bone, blending in with the periosteum, given that these connective folds are only covered by the stratified epithelium [30].

After that, Silveira (2009) [9] reported that rugopalatinoscopy identification, also called palatine rugoscopy and palatine rugoscopy, consists of observing the palatine vault, where just behind the central incisors, in the midline, there is a salient area, whose shape and dimensions vary from person to person, called papilla, the palatine or incisive papilla. In the palatine vault, there is a prominent line appearing, which corresponds to the raphe, palatine, the area corresponding to the welding of the upper jaws. In the anterior third of the palatine raphe, on each side of the median line, a series of ridges, whose shape and size are variable, are called palatine plates, palatine folds, palatine wrinkles, or palatine folds.

Determining Age by Teeth

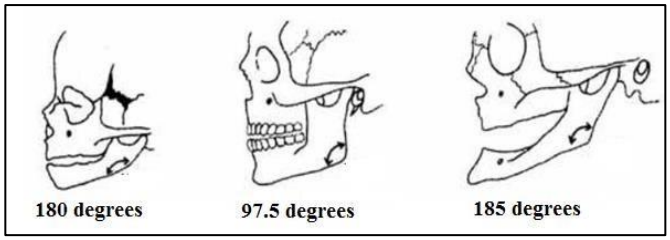
The ideal way to estimate age would be the sum of several factors, such as height, weight, presence of wrinkles, presence and color of hair, etc. In addition, the younger the person, the easier it is to estimate age, explaining that there are two methods of carrying out the examination, the direct method performed through clinical examination, observing the number of erupted teeth, the eruptive sequence, the eruption chronology and the general condition of the dental elements, such as caries, abrasions, extractions, wear, restorations, etc. And the indirect one, which is carried out through the analysis of intra and extra-oral radiographs, observes dental mineralization [3,6].

In this sense, teeth can serve as age estimators. There is likely a central maturation mechanism for the child as a whole, but there is also independence between the different sectors and hence the different times of maturity. The phenomena linked to tooth eruption can occur early or late due to several factors, although studies of the influence of pathological conditions on odontogenesis demonstrate that these are less affected than the skeleton. Teeth are not very affected by nutritional deficiencies, which is not the case with bones, as chronological age is compatible with dental age even in undernourished children, a fact that is not observed in skeletal tissue [1,3].

Determination of Age by Mandibular Angle

Mandibular angulation can be used to help determine age, since in the mandible the gonion, mandibular angle, or gonial angle, which is formed by the ascending angle and the horizontal branch (cervicofacial) of the mandible, can be used. It has also been reported that the simplicity and practicality of this method make some authors prefer to use it in vivo, rather than employing more complex measurements and techniques (Figure 2) [2,3].

Figure 2. Illustration of variations in mandibular angles as age increases from left to right.



Source: Own authorship.

Dental X-ray

Authors have highlighted that several methods are

used in the identification of human remains, most of which are based on the comparison between antemortem and post-mortem data through dental radiography. Even though the fingerprint technique is considered the most accurate, in many cases it cannot be used, especially when the bodies have been mutilated, decomposed, burned, or fragmented. Thus, the methods used by Forensic Dentistry become extremely valuable, since teeth and restorations are very resistant to destruction by fire, preserving numerous individual characteristics [3].

Dental Documentation

Since cadavers are identified comparatively, correct and adequate storage of the dental record is necessary, with all care taken to extend such a document, not only for the importance of identification but also for control and even optimal procedure planning. The code of the dental ethical process in its Art. 4th Inc. VI says: It is a fundamental duty of enrolled professionals to prepare the patients' clinical records, keeping them in their file [25,26].

The model advocated by the Federal Council of Dentistry shows how the dental record should be [26]. The model asks questions such as: Was the diagnostic information adequate to meaningfully identify all clinical problems? Were the diagnoses correct, based on the available information? Was the treatment plan well-founded, based on diagnostic information and assessment of the problems? Was the treatment properly prioritized and carried out in the proper sequence? Was the patient's comprehensive care appropriate and adequate?

Discussion

It was observed that there was difficulty in researching in detail the facts related to forensic dentistry, facts that have been more in-depth recently in research, before being found only in older articles, with few findings in the databases. Thus, forensic dentistry is proving to be increasingly effective in identifying bodies from mass disasters, as can be seen in some cases, such as the terrorist attack of September 11, 2011, in the USA, or the identification of victims of the TAM Airbus A320-233 flight that took place at Congonhas airport in 2007, when forensic dentistry was indispensable, leading to a large number of identifications of the victims. In this way, forensic dentistry when in disaster situations is essential, being highlighted by Sopher (1972) who stated that the identification is done with the combination of numerous characteristics and details, which makes the whole procedure easier and more reliable.

After that, it is emphasized that the conditions for an identification process to be applied must meet five fundamental technical requirements, which are: uniqueness, individuality or variability; Immutability; perenniality (persistence); practicality, and classifiability. Forensic dentistry is more advantageous compared to other methods, as it is cheaper, easy to apply, and mainly because of its reliability, pointing out that its importance in the forensic environment for the elucidation of cases tends to grow more and more [1-3].

The DNA technique is the last alternative, given that it is very expensive, other methods must be applied by the forensic dentist and that can confirm the identity of an individual, except in cases of carbonization. This fact was confirmed by the author and Silva (1997) [31] who stated that these two factors lead to DNA degradation and that the tooth, as it has the hardest tissue in the body, serves as protection for this genetic material, often being the only part of the human body from which DNA can be extracted.

Also, estimating an individual's height using Carrea's (1920) mathematical equation is also of paramount importance. This author developed a height estimation technique with measurements of the central incisor, lateral incisor, and lower canine, with measurements of the radius and chord. Added to this, several studies try to reinforce this formula, but also the difference is sometimes very discrepant between the height given by the calculation and the real height, but still serves as a support in expertise, especially in charred victims, which tends to lose a large amount of body mass [9].

The simplest way to identify forensic dentistry is to use the dental record and compare it with the procedures performed by the dentist, but this comparison would not be possible if there were not adequate documentation, since forensic dentistry is a comparative science, and each detail helps in the identification, such as canal treatments, implants, and restorations, which can be compared to the shape and in which teeth they were made, remembering that there is not more than one person in the world with the same arch [31,32].

All techniques for human identification are possible through the dental record of the alleged victim, which must always be updated and in good condition, which facilitates the efforts of the forensic dentist. To corroborate this, the Federal Council of Dentistry cites the importance of a good medical record, in 2004 it elaborated on what should be included in that medical record, and if everything that was recommended were followed, the expert work would be extremely facilitated in mass disasters [25].

Conclusion

It is concluded that it is necessary to use several methods to optimize the practice of forensic dentistry, from cases of identification through the oral cavity, which was the beginning of the history of forensic identification in the field of dentistry, to the nowadays, its rise in history was analyzed for an effective elucidation of recognition of charred bodies.

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Ethical Approval

Not applicable.

Informed consent

Not applicable.

Data sharing statement

No additional data are available.

Conflict of interest

The authors declare no conflict of interest.

Similarity check

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References

1. Chakraborty P, Pandey A, Natarajan S, Dahal S. Awareness and perception of an Indian dental professional in context to the process and their role in disaster victim identification as a taskmaster. J Forensic Odontostomatol. 2022 Dec 30;40(3):34-44.
2. Chiam SL, Louise J, Higgins D. "Identified", "probable", "possible" or "exclude": The influence of task-irrelevant information on forensic odontology identification opinion. Sci Justice. 2022 Jul;62(4):461-470. doi: 10.1016/j.scijus.2022.06.002.
3. Shah P, Velani PR, Lakade L, Dukle S. Teeth in forensics: A review. Indian J Dent Res. 2019 Mar-Apr;30(2):291-299. doi: 10.4103/ijdr.IJDR_9_17.
4. Thampan N, Janani R, Ramya R, Bharanidharan R, Kumar AR, Rajkumar K. Antemortem dental records versus individual identification. J Forensic Dent Sci. 2018 SepDec;10(3):158-163. doi: 10.4103/jfo.jfds_13_18.
5. Gambhir RS, Singh G, Talwar PS, Gambhir J, Munjal V. Knowledge and awareness of forensic odontology among dentists in India: A systematic review. J Forensic Dent Sci. 2016 Jan-Apr;8(1):2-6. doi: 10.4103/0975-1475.176954.
6. Dutta SR, Singh P, Passi D, Varghese D, Sharma S. The Role of Dentistry in Disaster Management and Victim Identification: An Overview of Challenges in Indo-Nepal Scenario. J Maxillofac Oral Surg. 2016;15(4):442-448. doi:10.1007/s12663-016-0896-4.
7. Brazil. Law No. 5081, of August 24, 1966. Regulates the practice of dentistry in Brazil. Brasilia: Official Gazette of the Union; 1966.
8. Almeida CVS. Bite marks and human identification [Master's Dissertation]. Porto: Fernando Pessoa University; 2012.
9. Silveira EMSZSF. Forensic dentistry: the importance of DNA for expertise and experts. Health, Ethics & Justice; 2006, 11(1/2):12-8.
10. Peres AS, Peres SHCS, Nishida CL, Grandizoli DK, Ribeiro IWJ, Gobbo LG. Experts and Expertise in Dentistry. Magazine of Dentistry of the City University of São Paulo 2007; 19(3):320-4. Federal Council of Dentistry. Resolution CFO-87, of May 26, 2009.
11. Silva RF, Daruge Júnior E, Pereira SDR, DE Almeida SM, De Oliveira RN. Identification of charred corpse using dental documentation. Rev. Odonto Ciênc; 2008, 23(1):90-3.
12. Silva RF, Prado MM, Barbieri AA, Daruge Júnior E. Use of dental records for human identification. Rev Sul-Brasileira de Odontologia; 2009, 6(1):95-9.10.
13. Paranhos LR, Caldas JCF, Iwashita AR, Scanavini MA, Paschini RC. The importance of dental records in human identification skills. Rev Fac Odontol Univ Passo Fundo; 2009, 14(1):14-7.
14. Oliveira JA. Determination of thermoscopic characteristics of Dentistry students at the Federal University of Paraíba [Graduation Monograph in Dentistry]. João Pessoa: Federal University of Paraíba, Health Sciences Center; 2010.
15. Stravianos C, Kokkos A, Eliades A, Andreopoulos E. Applications of forensic dentistry – part II. Res J Med Sci; 2010, 4(3):187-94.
16. Oak GP. History of Forensic Dentistry – Overview. March 02, 2009. Available at: http://www.carvalho.odo.br/index.php?opition=com_content&task= view&id=124&itemid=28. Accessed on: 04/14/2023.

17. Santos UDD. Main means of human identification in Forensic Dentistry [Specialization Monograph in Forensic Dentistry]. Contagem: Funorte Núcleo Contagem; 2011.
18. Holy DPS. Medical-dental expertise in human identification [Master's Dissertation]. Porto: Faculty of Health Sciences, Fernando Pessoa University; 2012.
19. Terada ASSD, Leite NLP, Silveira TCP, Secchieri JM, Guimaraes MA, Silva RHA. Human identification in forensic dentistry through photographic recording of a smile: a case report. Rev Odontol UNESP; 2011, 40(4):199-202.
20. Bhargava K, Bhargava D, Rastogi P, Paul M, Paul R, Jagadeesh HG. Review research paper: an overview of bite mark analysis. J Indian Academy Forensic Med; 2012, 34(1):971-3.
21. Almeida JE, Reis FP, Galvão LCC, Alves MC, Campos PSF. Analysis of inter canine distance to sex and its application in the identification and interpretation of bite marks. Post Grad Rev RPG; 2012, 19(1):14-20.
22. Alonso LG, Genofre GC. Molecular Genetics and Forensic Dentistry. Rev. Odontol. Univ. Santo Amaro, 1999, v. 4, p. 30-3.
23. General Assembly of the World Medical Association. 46th, Stockholm Declaration: On medical ethics in mass disasters. Stockholm, Sweden, 1994.
24. Baker BR, Cottone, J. The history of forensic dentistry. Ann Arbor: UMI, 1992.
25. Federal Council of Dentistry. 2004. Code of Dental Ethics. Available at: http://www.cfo.org.br. Accessed on: 04/10/2023.
26. Federal Council of Dentistry. Consolidation of norms for procedures in Dental Councils. Approved by Resolution CFO 63/2005.
27. Cavalcanti AL, Porto DE, Maia AMA, Melo TRNB. Stature estimation by using the dental analysis: a comparative study between Carrea's and the modified methods. Rev Odontol UNESP; 2007, 36(4): 335-339.
28. Potsch L. Application of DNA techniques for identification using human dental pulp as a source of DNA. Int. J. Legal Med., 1992, v. 105, p. 139-43.
29. Gomes IS. The importance of palatal rugoscopy in human identification [Master's Dissertation]. Porto: Faculty of Health Sciences, Fernando Pessoa University; 2012.
30. Tornavoi DC, Silva RHA. Palatal rugoscopy and applicability in human identification in forensic dentistry: a literature review. Health, Ethics & Justice; 2010, 15(1):28-34.
31. Silva M. Compendium of Forensic Dentistry. São Paulo: Medsi; 1997.
32. Caldas JCFG. Determining the identity of a bone using dental records: a case report. Odonto (São Bernardo do Campo), 2005, v. 13, p. 25-9.