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Published in:
RBOL- Revista Brasileira de Odontologia Legal

DOI:
[10.21117/rbol-v10n12023-482](https://doi.org/10.21117/rbol-v10n12023-482)

Publication date:
2023

Document Version
Peer reviewed version

[Link to publication in Discovery Research Portal](#)

Citation for published version (APA):
Manica, S., & Manica, G. (2023). A career in Forensic Odontology: it is not just about teeth. *RBOL- Revista Brasileira de Odontologia Legal*, 10(1), 2-8. <https://doi.org/10.21117/rbol-v10n12023-482>

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A career in Forensic Odontology: it is not just about teeth

Abstract: Throughout the world, forensic odontology academic programmes have been designed and permeate discussions about international or local standard operational protocols, principles or guidelines requiring current technical and scientific knowledge. The heterogeneous groups of students who aim to pursue this career might have high educational and occupational aspirations that will be confronted with the labour markets. In this report, the authors briefly present aspects of the education and training that comprise the choice of a career in forensic odontology nowadays. In conclusion, the individual who opts for forensic odontology as a career must be prepared to find the confidence and resilience to practice professional skills in a unique and challenging field to comply with the society's expectation.

Keywords: Forensic Odontology; career choice; teaching; professional development; quality assurance.

Introduction

Forensic dentists can work in a range of different settings, including clinical practice, management, education and research. In these different contexts they work with a variety of people, including police forces, lawyers, and other professionals. Currently, there is no agreement as to whether education in Forensic Odontology should be delivered to dental undergraduates as a compulsory or optional discipline, or whether it should be acquired as postgraduate training, that could possibly guarantee its socio-historic status as a specialty¹⁻³. In Europe, with few exceptions, most dental schools offer several hours of teaching forensic odontology during the last years of undergraduate education^{4,5}. Similar structure is seen in Japan, Australia, Malaysia, Nepal and Brazil but in other countries such as Pakistan, the teaching and training is yet to be fully developed and implemented^{1,3,6}.

It is valid to state that, globally, a guiding template containing indicative content and intended learning outcomes of academic programmes that could stipulate the required standards set for the teaching of this profession has not been structured by any statutory and accredited professional society or association. Neither has much been said regarding the expected professional or academic background of its educators. However, it is technically understood that having knowledge of basic science in odontology, such as dental development and histology, and a broad awareness of dental record systems, tooth numbering and interpretation of symbols and abbreviations, are of fundamental importance².

In relation to the homogeneity of what has been taught in the various universities that teach forensic odontology, a previous study found a common framework that included: dental autopsy, disaster victim identification, age estimation, and bite mark analysis¹. However, the lack of official guidelines and rules that, regulated by specific councils, would exercise regulatory or supervisory authority over the preparation of professionals (and the prospective evaluation of their practices, and continuing professional development), present a risk to both (a) apprentices and professionals of the field, and (b) to the public they serve. In this sense, when inadequate professional behaviours, unethical attitudes, or breaches of standards of conduct and performance of university programmes, employers, and field collaborators occur, there is little that can be done to clarify whether an outline of students', professionals' or public's expectations has been transgressed.

This discussion briefly explores topics that are interdependent and derive from the learning, the teaching, and the profession of Forensic Odontology and expose difficulties that, if openly discussed, could be assessed and transformed with the aim of protecting its students, practitioners, and the society in which these are situated.

Understanding some aspects of career information and choice

It is necessary to first emphasise the influences that the phenomenon of what has been called the 'Crime Scene Investigation (CSI) effect' have on those who decide to start a career in a Forensic field⁷. These programmes can create, in the minds of the public, the expectation of unrealistic outcomes and the unawareness of the

complexities that forensic odontologists face in their day-to-day practices could, in a preventative way, diminish the effects of the uncritical approach individuals may hold in relation to the true nature of this work.

In addition, the disclosure of the contents and skills of the area must also include the global transformations in work systems and workplaces, arising from economic internationalisation and globalisation. Hence, a discussion of what in certain historic-geographical locations involves a professional practice permeated by under-staffed, overworked, under-resourced, highly pressured, and under-funded departments and/or labour realities. To do this, it is necessary to evaluate what policies or programmes are available to guide individuals to make career decisions.

It is important to observe that younger people are in the exploration stage with a progressive narrowing of career options based on the amalgamation of their interests, culture, gender, personality, skills and life experiences⁸. In contrast, mature individuals, consider the harmony they can reach between the roles they already play as spouses, bread winners, and child carers and their career choices⁹. In addition, some mature people who are already established in other dental specialties may choose to make a career change into forensic practice. Although this individual can bring valuable skills and competencies to the new field, it must be observed that issues such as fear of failure, balancing priorities and sense of purpose might occupy the mature individual's mind, who, while transitioning between careers, could experience a surplus of anxiety to succeed in her decision.

Information on career guidance must come from multiple sources allied to other complementary information that is accessed through self-learning and job investigation activities of data available in mass media and career conferences. These resources must also highlight to the student or the professional the active posture and the self-responsibility they must assume in deciding for a choice that will reverberate in all spheres of their lives¹⁰.

It is also useful to state the occupational hazards of the profession, that is, the risk of suffering from mental health problems derived from its professional demands such as the identification of dead bodies and investigation of living subjects or who suffered from personal or collective violence (self-inflicted or not, echoing from

domestic or sexual violence, general crimes, mass attacks, terrorism, natural catastrophes, aeroplane and/or car crashes). The resilience of the choosing individual while confronting these hazards is a complex capacity that depends on temperament, style of emotional regulation, capacity for endurance towards the topics of violence and death, and access to psychological support upon request. Nevertheless, the long-term exposure to emotionally demanding work situations – in all fields, and not only in relation to forensic odontology – cannot be underestimated as they create psychological and medical consequences, contributing for the onset of job burnout, low self-esteem, withdrawal behaviours, addictions, trauma, or even the psychosocial inability to continue in the professions¹¹.

Another factor to be discussed is the socio-cultural, political, and economical distinctive characteristics that their local labour markets present, if their intention is not to migrate to find employment. Individuals who live in countries marked by developing and transition economies must consider the limited public resources, high unemployment and poverty, and at times specific family and cultural factors which may have a major impact on career decision-making⁹. Furthermore, individuals that wish to migrate might be fully informed on migration rules, laws and licenses to practice in the elected country, what is costly and may involve the attendance to overseas registration examinations.

It is also fundamental that the individual who receives career guidance related to forensic odontology is informed on whether the evolution of her career depends on private or public employment, as many developed countries are closing their government-ruled Forensic Science Services¹⁰⁻¹². In this way, individuals who opt for a career in forensic science [as in other fields] must bear in mind that they shall work on the value of their employability, for they are challenged to play a more independent role in constructing their own career development. This means to say that what needs to be created as secure is the individual, and the individual's knowledge and skill currency, not the job¹³.

In this sense, even though campus career services should be prepared to offer three main qualities of intervention to their users, namely: career information, career

counselling, and career education services¹⁴, we believe that more attention should be given to career counselling in this integrated process.

Specific aspects and challenges about the teaching of Forensic Dentistry

As already exposed, specific training is required to become a forensic odontology expert, and professional activities in this area should be carried out by educators properly trained with good scientific background and practical experience^{2,14}. A good level of exposure to different types of case work – quantitative and qualitatively – allows the forensic dentist to share a comprehensive range of learning situations with the student. In this way, the student is stimulated to develop a problem-based approach to the demands she will concretely face in her forensic practice. This may be achieved by offering mortuary sessions (including human remains of real cases or not) and court of law-based simulation within university education, assessing the problem of bridging the gap between theory and practice¹⁵. More importantly, prospective students must be aware that report writing is a major task. Even though, the content and structure of forensic reports may vary according to the referral question and the professional's style, several core features must appear in most forensic reports¹⁶.

More importantly, the lecturer must convey the awareness of what is theoretically important, what really works and what are the mistakes that can be avoided in the student's practices. According to the National Academy of Sciences' (NAS) latest report on Forensic Science, it is crucial to improve undergraduate and graduate forensic science programmes to correct some of the acknowledged deficiencies¹⁷. The legitimization of practices in the forensic science disciplines must be based on established scientific knowledge, and principles, which are best learned through formal education. Practically, past experiences in teaching degrees in forensic fields demonstrated that programmes simultaneously should meet the requirements of academia, professional organisations and prospective employers¹⁵. A study on the lecturers' opinions on teaching the subject in the 21st century included main problems such as lack of funding, official recognition, case work and limited hands-on courses².

Another important aspect is the importance of dental records for the comparative dental analysis in human identification. The student is trained to compare the postmortem findings during dental autopsy with the antemortem dental records received; however, dentists not always compile a complete dental chart of the patient^{18,19}. Even though guidelines exist for maintaining dental records, they are often quite broad and not necessarily adhered to²⁰. Moreover, ante-mortem dental data is customarily available in developed countries whereas dental records are usually scanty or non-existent in those countries with poor standards of health care²¹. One on hand, the technology is widely explored to aid human identification such as automated methods using 3D digital dental data²² and virtual dental autopsies²³ and on the other hand, we are still struggling with a simple but crucial element which is the lack of antemortem dental records. Another limiting aspects to be considered are the need of International guidelines on quality assurance in age estimation reports²⁴ and the weak foundations of bite mark analysis²⁵.

In specifically targeting the unrealistic expectations about forensic science created by students, some strategic measures can be taken in the classroom to protect them from being biased or excessively pressurized. Inspired by a useful essay written by Bergslien (2006) in which she suggests, based on her experience in teaching forensic geology, pedagogical exercises to make the forensic practice more critical and objective²⁶, one of the authors of this writing developed specific examples of actions to be performed in the teaching of forensic odontology, which are as follows:

1. To develop secondary activities involving human identification cases where comparative dental analysis is not possible to be carried out because antemortem (AM) dental records are not provided. This would encourage students to perform the act of dental profiling and their dental knowledge would be highly tested. According to Bergslien (2006), the lack of a data set for comparison makes students to think critically about resource management, spend time planning their analytical approach, and logically defend their choices.
2. To create a case involving bite mark injuries including several possible perpetrators who are, in reality, innocent people. It is not uncommon to see the prejudiced or 'revengeful' nature of students and their perhaps infantile tendencies to attempt to enact the role of the 'good' protagonist who fought against the 'bad'

antagonist (hero Vs villain). Moreover, it is essential to discuss about the weak scientific foundations of bite mark evidence, its limitations, and dangers. Skin properties and the victim's posture during the biting influence distortion that could lead to inaccurate measurements and misleading pattern interpretation of bite mark injuries²⁷.

3. To design an age estimation case where the subject claims to be a juvenile. Supply the student with a radiograph showing all permanent teeth except third molars. Cases involving legal age require the forensic dentist to assess the development of third molars (the last permanent teeth to develop) using non-invasive techniques. This challenging scenario would test the choices of methodologies but, nevertheless, an opinion on minimum age can be given.

4. To create a mock trial and allow students to explain the content of their reports to legal experts in lay terms, for the forensic odontologist's specialised knowledge is often a hindrance to effective lay communication. This is an excellent exercise to test the clarity of their written and verbal communication in the witness box, what ultimately strengthen the commitment to engage the public and to make scientific evidence accessible.

Undeniably, there is an increase of questions about the validity of forensic procedures in court and so what is taught in the classroom must reflect this need for robust, unbiased, and statistically supported reporting. Educators should inspire graduates to carry considerable professional responsibility and demonstrate consistence, competence, and self-confidence in their future workplaces¹⁵.

Conclusion

Forensic odontology as a career choice involves continuous education, developing qualities of self-promoting one's skills and exercising flexibility toward the mutable aspects of labour markets. Nevertheless, quality assurance of international academic programmes is yet to be fully discussed and monitored by dental councils, national associations and international organizations.

Conflict of interest

The authors declare no conflict of interests

Acknowledgements

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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