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ORIGINAL ARTICLE

Knowledge of legal dentistry and of health regulations by the dentists and stomatologists of the Valencian Community ☆

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KEYWORDS

Legal dentistry;
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Abstract

Objectives: The main objective of this study is to analyze the knowledge of the dentists and stomatologists registered in Alicante, Castellón, and Valencia, the 3 provinces that make up the Valencian Community, in Spain, with regard to legal dentistry and the current health legislation and regulations, and to quantify the relationship between level of training, specialization, work experience, position, and workplace with the degree of knowledge.

Material and methods: An anonymous survey was designed and validated, consisting of 33 multiple-choice questions. The survey included questions regarding their professional profile and key questions regarding current dental law, forensic science, and expertise.

Results: The level of knowledge is moderate, with only 63% of the questions answered correctly. Neither their level of training nor work experience correlates significantly with their degree of knowledge. Dentists specialized in General and Aesthetics Dentistry were found to be more knowledgeable about ethical issues. Regarding the workplace, those working as university teachers tended to stand out from the other professionals in terms of legal and ethical knowledge whilst self-employed and employee dentists show a lower level of knowledge than the rest of the sample.

Conclusions: The conclusions obtained from this study highlight the need for dentists to complete and update their knowledge of legal dentistry and current health legislation, as having proper knowledge is a means of avoiding possible legal problems, which not only means better legal protection for the dentist but is also a means of guaranteeing adequate patient care.

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PALABRAS CLAVE

Odontología legal;
Legislación sanitaria;
Jurisprudencia médica

Conocimiento sobre odontología legal y la normativa sanitaria por parte de los odontólogos y estomatólogos de la Comunidad Valenciana

Resumen

Objetivos: El objetivo principal de este estudio es analizar los conocimientos que poseen los odontólogos y estomatólogos colegiados en Alicante, Castellón y Valencia, las tres provincias que conforman la Comunidad Valenciana, acerca de odontología legal y sobre la legislación y normativa sanitaria actual, e intentar cuantificar la relación entre nivel de formación, especialidad, experiencia laboral, lugar y figura en el trabajo con el grado de conocimiento.

Material y métodos: Se diseñó y validó una encuesta anónima, de treinta y tres preguntas tipo test. Esta encuesta incluía cuestiones sobre el perfil profesional y preguntas clave acerca del derecho dental actual, ciencias forense y peritación.

Resultados: El nivel de conocimiento es moderado, con solo el 63% de las preguntas respondidas correctamente. Ni el nivel de formación, ni la experiencia laboral se correlacionan significativamente con el grado de conocimiento. Los dentistas especializados en Odontología General y Estética resultaron ser más conocedores de cuestiones éticas. Con respecto al lugar de trabajo, los docentes universitarios tienden a diferenciarse del resto de profesionales en cuanto a conocimientos legales y éticos, mientras que el perfil de autónomo y empleado muestra un nivel de conocimientos inferior que el resto de la muestra.

Conclusiones: Las conclusiones obtenidas de este estudio ponen de relieve la necesidad que tienen los dentistas de completar y actualizar sus conocimientos en materia legislativa sanitaria actual y en odontología legal, pues un buen conocimiento supone una garantía para evitar posibles problemas legales, lo que no solo supone una mejor defensa del odontólogo sino una garantía para la adecuada atención al paciente.

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Introduction

The odontological profession has undergone a major and very fast revolution over recent years. In 2009, a report was published at the request of the Valencia Association of Odontologists and Stomatologists (ICOEV) on the demographics of the dental profession in the province of Valencia. This clearly showed that the number of dentists had multiplied by 4 in the 20 years after the middle of the 1980s, from 1 dentist for almost 6000 inhabitants to 1 for fewer than 2000.¹ These figures have continued to constantly increase, thanks to the existence of several private universities within the Community.

Law and ethics are an important part of professional medical and dental practice. The subject of Legal and Forensic Odontology is an essential part of the education of professionals, and it includes the comprehension of broader questions in odontological practice, including ethics, medical–legal considerations and managing and maintaining a safe working environment.² A paper by Garbin et al. pointed out that dentists were negligent regarding legal and ethical dental questions, and that further studies were necessary to examine this point.³ Together with the contents of the paper by Dhanappa et al., this makes it possible to state that there is a need for suitable education for graduates, to increase their awareness of aspects of legal education, and how to maintain professional ethics in healthcare.⁴ As Avon and Ryan conclude, each medical professional must understand the forensic implications

associated with the exercise of their profession, and they must also be aware of their responsibility.^{5,6}

Understanding legal aspects gives protection against litigation and supplies essential information for the comprehension of the importance of dental clinical histories and radiographies, photographs, and models. This is because in legal terms, the written records of a dentist have more weight than patients' own memories.⁷

Due to all of the above reasons, we designed this study to discover the degree to which odontologists in the Valencian Community are aware of legal odontology, and most especially the medical regulations which are now in force. Dentists' level of knowledge was also quantified according to 5 variables: educational level, their speciality, work experience, their place of work, and type of employment.

Material and methods

A survey was designed on odontological medical-legal knowledge, attitudes, and practices, and on the medical law that now governs odontologists and stomatologists in the Valencian Community (supplementary material A). This was validated beforehand by 9 dentists in different specialities and supervised by a statistician. It was then approved by the president of the Biomedical Research Ethics Committee of CEU-Cardenal Herrera University with reference number CEI19 / 154 (supplementary material B). The identity of

respondents was confidential, as each one was assigned a code or IP (Internet Protocol) address when they answered the survey.

The questionnaire used the SurveyMonkey® platform and was sent from the official electronic mail address of the Association. It is composed of 33 test questions divided into 3 blocks: the first block contains questions about ethical knowledge, professional ethics, and the organization of the association. The second block covers knowledge of the law, and the third covers legal–odontological documentation.

The study population is composed of odontologists and stomatologists in the Valencian Community, of whom 1185 were members of the Alicante Association of Odontologists and Stomatologists, 337 are members of the Castellón Association, and 2664 are members of the Valencia Association. The 4186 associates took varying lengths of time to complete the survey, from January 16 to March 9, 2020.

For the purposes of statistical analysis of the information obtained in the survey, it included a descriptive part as well as another bivariate inferential part. The descriptive analysis of the replies to the survey used a format of tables containing the most important statistics: absolute and relative frequencies for categorical variables, and the average, standard deviation, minimum, maximum, and median for continuous variables. Inferential analysis included a series of bivariate statistical methods to achieve the different objectives, and χ^2 association tests were used to evaluate the relationship between the suitability of responses and the personal and professional profiles of participants.

A preliminary study was undertaken of the sample size, concluding that to estimate a population proportion with a maximum error of 6.75% for $p = q = 50$ and a 95% confidence level, a sample of at least 200 subjects was necessary.

The final sample for this research was composed of 204 professionals who are members of the Association in the Valencian Community.

Results

Analysis of the whole sample

When the results of the survey are analyzed on the basis of the percentage of correct answers by each subject, an average of 61.9% correct answers were found in the first block of questions about ethical knowledge. 65.3% of the second block questions on knowledge of the law were answered correctly, together with 62.2% of the third block questions on odontological–legal documentation. This amounts to 63.4% of correct answers to all of the survey questions, as may be seen in Fig. 1.

Analysis according to educational level

Respecting the level of training, only the results of 2 questions were statistically significant. Odontologists with a degree qualification were more likely to give an incorrect answer to question 16, on who should be informed of our suspicion when there was evidence of work by unqualified individuals (11%). For question 14, on the fundamental principles of the dentist–patient relationship, 48.3% of those

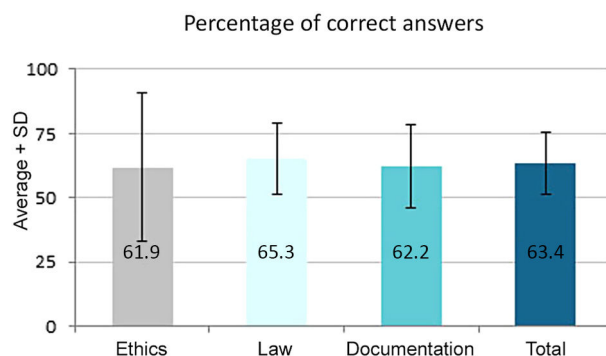


Fig. 1 Percentage of correct answers, average, and standard deviation in the Valencian Community. SD: standard deviation.

who had received more training answered correctly, compared to 30% of those who had received less training, as may be seen in Table 1

Analysis according to speciality

Regarding specialization, the group who had studied general odontology as their speciality showed significant differences in their average scores in the block of ethics questions, at 65.9%. This was the second-highest score of all the specialities, below the score corresponding to cosmetic specialists, who obtained 69.5%. Nevertheless, both of these specialities scored far higher than the average total score of all the specialities in this section, which was 61.9%, and this was also the case for all of the questions in the survey, with a total average of 64.9% in all 3 blocks, the second-highest score of all of the specialities, as may be seen in Table 2

Analysis according to work experience

No major differences were found in the level of knowledge depending on how long the subjects had been working. The only question with an outstanding result was number 26, which is about the importance of informed consent. Curiously, respecting knowledge according to work experience, 63.8% of the dentists who had been working for 5–10 years were far more likely to answer this question correctly than were those who were just starting to work, at 31.4%, or the most veteran dentists, who scored 37.7%, as may be seen in Table 3

Analysis according to place of work

In terms of the relationship between place of work and level of knowledge, university teachers were the most heterogeneous group in comparison with the whole sample, as significant differences were found in up to 3 questions. Firstly, they knew less about question 18, on professional confidentiality, obtaining an incorrect response rate of 26.4% when the total percentage of incorrect responses was 17.2%, obtaining the highest percentage of incorrect answers in comparison with those in all of the other places of work, who achieved scores of 13.3% or 18.9%, among others.

Table 1 Knowledge of obligatory and additional academic education in questions 16 and 14.

		Obligatory academic education							
		Total		Degree in Medicine specializing in Odontology		Degree in Odontology		Qualification in Odontology	
		N	%	N	%	N	%	N	%
P16. If there is evidence of a crime of unqualified working:	Total	204	100.0%	21	100.0%	145	100.0%	38	100.0%
	Incorrect answers	16	7.8%	0	0%	16	11.0%	0	0%
	Correct answers	187	91.7%	21	100.0%	128	88.3%	38	100.0%
	DK/DA ^a	1	0.5%	0	0%	1	0.7%	0	0%
		Additional academic education							
		Total		No		Yes			
		N	%	N	%	N	%		
P14. The fundamental principles of the dentist-patient relationship:	Total	204	100.0%	30	100.0%	174	100.0%		
	Incorrect answers	102	50.0%	21	70.0%	81	46.6%		
	Correct answers	93	45.6%	9	30.0%	84	48.3%		
	DK/DA ^a	9	4.4%	0	0%	9	5.2%		

^a DK/DA: Does not know/does not answer.

Nevertheless, this group displayed a higher level of knowledge for questions 23 and 24, which center on patients' clinical histories. They achieved 84.9% of correct answers to question 23, while the total percentage of correct responses amounted to 71.9%. They therefore obtained the highest percentage of correct responses, and this differed in comparison with the scores obtained by those in all of the other places of work. Something similar occurred with question 24, where the group of teachers scored 88.7% correct answers, when the total percentage of these was 74.9%, giving a score far higher than this, as may be seen in [Table 4](#)

Analysis according to type of employment

Finally, respecting the findings of the relationship between type of employment and knowledge level, it was found that

the self-employed and employees as a whole different from the rest. [Fig. 2](#) was prepared to show this more clearly.

One of the questions which contributed the most to this result was question 22, about professional confidentiality. Only 58.8% of the self-employed and employed odontologists answered this correctly, as opposed to 73% of the total number of correct responses by all of those in different forms of employment, so that this group obtained the lowest percentage of correct answers to this question. Question 30 on demands made of expert assessors is also of interest, as the level of knowledge displayed by this group of professionals amounted to only 44.1%, as opposed to 62.7% of all of the correct responses by all of those in other types of employment. Once again, this is the lowest percentage of correct answers.

Discussion

This study has made it possible to objectively quantify the level of knowledge about current medical law and regulations held by odontologists and stomatologists who are members of the Valencian Community Association. In general, they scored 6.34 out of 10 for this.

The dentists who were surveyed had the lowest score for correct answers, with 61.9% of the questions in the first block. These questions centred on their level of knowledge about ethics, showing, as did the paper by Adhikari, "that a significant proportion of doctors were not aware of universally recognized ethical principles which form an essential part of their clinical practice".⁸ Furthermore, it should be remembered that it is sometimes difficult to disassociate the legal and ethical basis of dentists' professional work. A moderate level of knowledge held by odontologists and

Table 2 Knowledge according to speciality.

	Total	Speciality		
		General odontology	Cosmetic	
Block of ethics questions	N	204	123	58
	Average score	61.9	65.9	69.5
TOTAL correct answers / for all 3 blocks	N	204	123	58
	Total average	63.4	64.9	65.1

Table 3 Knowledge of question 26 according to work experience.

		Work experience							
		Total		< 5 years		5-10 years		> 10 years	
		N	%	N	%	N	%	N	%
P26. Which of the following statements is not correct respecting informed consent?	DK/DA ^a	3	1.5%	0	0%	1	2.1%	2	1.6%
	Total	204	100.0%	35	100.0%	47	100.0%	122	100.0%
	Incorrect answers	112	54.9%	22	62.9%	16	34.0%	74	60.7%
	Correct answers	87	42.6%	11	31.4%	30	63.8%	46	37.7%
	DK/DA ^a	5	2.5%	2	5.7%	1	2.1%	2	1.6%

^a DK/DA: does not know / does not answer.

stomatologists about the law and current medical regulations may therefore not be sufficient for them to safely work in their everyday clinical practice, and this is so for them as well as for their patients.

At the start of this study it was thought that those dentists who have received the most additional training, by undertaking different educational activities, would have more possibilities of receiving more information about current law or regulations. They would therefore have obtained better results in this survey than other groups who would have received less additional information. However, as is shown by the findings of this study, the level of training is not significantly associated with degree of knowledgeability.

Respecting specialization and the level of knowledge, after reading the 2019 paper by Bordonaba-Leiva et al. on lawsuits due to negligence in the last 24 years in the field of oral and maxillofacial surgery in Spain,⁹ we thought at first that odontologists and stomatologists who specialized in oral surgery and implantology would achieve higher scores as they would be more aware of these matters. Nevertheless, although certain differences emerged according to the

speciality of professionals, the respondents who work in general and cosmetic odontology were found to know the most about ethical aspects.

The above finding may be due to the fact that odontologists who specialize in cosmetic therapy and general odontologists who have to perform major oral renovation work have to spend more time evaluating the ethical weight of the potential aesthetic benefit vs. the multiple risks involved in the treatment. It is therefore logical that they obtain higher scores in the block of questions about ethical knowledge, as they have to maintain this critical ethical equilibrium.

Respecting years of work experience and degree of knowledge, the conclusions of the 2014 paper by Dhanappa et al. stated that it is important and necessary for graduates to be properly educated and aware of aspects of legal education and how to maintain ethical professional behaviour in the field of healthcare.⁴ It was thought that as they had graduated the most recently, the newest odontologists and stomatologists would remember these matters better and would therefore obtain better results in the survey. They would have studied the Odontology Qualification more

Table 4 Level of knowledge and place of work.

		Place of work			
		Total		University teachers	
		N	%	N	%
P18. What type of secrecy is involved in professional confidentiality?	Total	203	100.0%	53	100.0%
	Incorrect answers	35	17.2%	14	26.4%
	Correct answers	168	82.8%	39	73.6%
P23. What is the minimum length of time that a clinical history should be kept, according to basic state law?	Total	203	100.0%	106	100.0%
	Incorrect answers	53	26.1%	29	13.2%
	Correct answers	146	71.9%	75	84.9%
	DK/DA ^a	4	2.0%	2	1.9%
P24. In the case of a patient who has died, who would have the right to access their clinical history?	Total	203	100.0%	106	100.0%
	Incorrect answers	44	21.7%	29	9.4%
	Correct answers	152	74.9%	72	88.7%
	DK/DA ^a	7	3.4%	5	1.9%

^a DK/DA: does not know / does not answer.

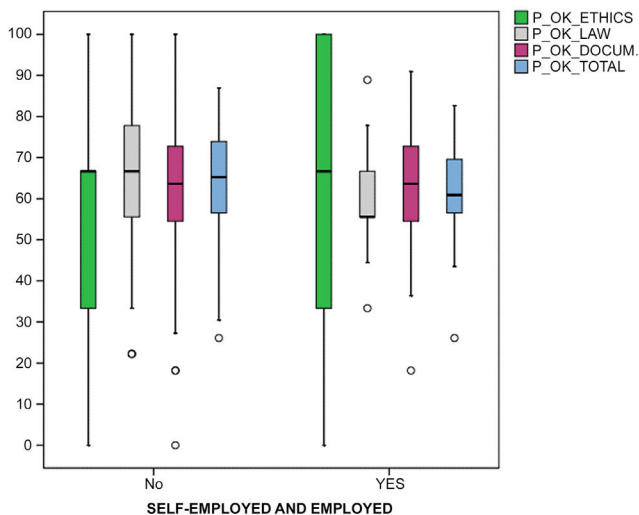


Fig. 2 Graph showing the distributions of knowledge among self-employed dentists and those who are employees.

recently, this being the subject that educates them in the field of "Legal and Forensic Odontology". Nevertheless, when the results of our study are analyzed, we can conclude that no noteworthy association is found between the duration of working experience and the level of knowledge in this subject.

Respecting the association between place of work and degree of knowledge, the respondents who work as university teachers, 26.1% of the total number of those surveyed, tend to be differentiated from those working in other fields. This may be because university teachers have to share their knowledge and teach not only future dentists, but also students from other subjects, post-graduates, courses, and offer technical training at other levels in connection with odontology, so that they have to keep more up-to-date in this field.

Finally, regarding the type of employment and degree of knowledge, we share the criterion of Perea Pérez B., as expressed in the paper titled "Professional responsibility in odontology" ("Responsabilidad profesional en odontología"). This states that it is clear that legal pressure from patients is increasing, so that dentists should accept this and try to adopt measures that minimize this risk. These measures include a minimum level of legal-medical knowledge about their work, being aware of the manoeuvres with the highest risk of lawsuits, and taking legal precautions against potentially disputatious patients.¹⁰ We therefore believe that dentists in positions of greater responsibility, as they are more likely to be involved in a claim or lawsuit, should obtain the best results here. However, after our study we were able to confirm that, although differences emerged in specific questions in association with the role of professionals, only the self-employed and employees displayed a level of knowledge below that of the sample as a whole.

Villanueva Cañadas¹¹ states that legal medicine includes knowledge that is indispensable and obligatory to work as a doctor. This is based on 3 reasons: the obligation to help the administration of justice in cases where this is required, because we live in a highly judicial society in which professionals are assailed by demands for rights and

obligations, and because knowledge is necessary as it makes it possible to defend citizens' rights when a professional, exercising his profession, is the guarantor of these rights.

We understand this to be perfectly applicable to odontology professionals, so that it is important for them to have knowledge about ethical and legal aspects which permit them to work correctly in their profession. The information obtained by our work will make it possible to improve the training of future professionals and modify the ongoing training of those who are already working.

Conclusions

1. Association members have a moderately high level of knowledge in the field of medical law and regulations. On average, hardly 63% of the questions were answered correctly. There is also a moderate level of knowledge about ethical, legal, and documentary aspects.
2. The degree of legal-medical knowledge is not significantly associated with educational level.
3. Some differences exist according to professionals' speciality. Those who work in general and cosmetic odontology are more aware of ethical aspects.
4. No noteworthy association was found between subjects' level of knowledge and the duration of their work experience.
5. Respecting place of work, it should be underlined that those who work as university teachers tend to differ from the other professionals in terms of specific questions, such as professional confidentiality or clinical histories. However, this is not the case for their overall scores or scores per block.
6. Respecting types of employment, although differences arose in specific questions, only 1 profile corresponding to self-employed and employed respondents as a whole displayed a lower level of knowledge than the rest of the sample.

The conclusions of this study show the need for dentists to complete and update their training in legal odontology, especially in terms of ethics and current medical law.

A general lack of knowledge was found respecting the regulations that govern professional penal responsibility regulated by the article 195 of the Penal Code, omission of the duty to help; article 199.2, divulging professional secrets; and article 397, the falsification of certificates; as well as the civil liability governed by articles 1101 and 1089 of the Civil Code, and articles 109 to 122 and 129 of the Penal Code. Given the lack of knowledge shown about professional confidentiality, the regulation of this in the Criminal Justice Law should be revised.

Likewise, dentists should update their knowledge of Royal Decree 1718/2010 of December 17, on medical prescriptions and dispensing orders, and, lastly, with reference to informed consent, they should know the content of General Health Law 14/1986, of April 25, and most especially, given its importance, the Basic Law 41/2002 of November 14 governing patient autonomy and rights and duties in the field of information and clinical documentation.

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Conflict of interests

The authors have no conflict of interests to declare.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.remle.2021.09.003>.

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