Awareness of Forensic Odontology among dental students and faculty in Cyprus

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Article

Awareness of Forensic Odontology among Dental Students and Faculty in Cyprus

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Abstract: This study sought to evaluate the awareness, comprehension, and practices concerning Forensic Odontology among dental students and faculty at a Dental School in Cyprus. An online, cross-sectional, descriptive survey was disseminated to the entirety of dental students and faculty of the School of Dentistry, European University Cyprus, in November 2022. Of those surveyed, 47 faculty members and 304 students responded, yielding response rates of 66.2% and 80%, respectively. The survey revealed that 87% of faculty and 65% of students were familiar with Forensic Odontology. A noteworthy 94% of faculty and 85% of students recognized teeth as DNA repositories. A high percentage, 98% of faculty and 89% of students, acknowledged the role of Forensic Odontology in the identification of criminals and deceased individuals. Awareness of age estimation through dental eruption patterns was evident in 85% of faculty and 81.6% of students. A substantial proportion (80% of faculty) maintained dental records, while 78% of students recognized the importance of dental record-keeping in ensuring quality care. Interestingly, 57% of students and 64% of faculty were aware of the possibility of dentists testifying as expert witnesses. The majority, 95.7% of faculty and 85% of students, concurred that physical harm, scars, and behavioral alterations predominantly indicate child abuse. The survey underscored a robust awareness of Forensic Odontology among respondents. Despite faculty's comprehensive understanding, there's a pronounced need to bolster their inclination towards attending relevant seminars. Emphasis on improved record-keeping practices for potential forensic applications is paramount.

Keywords: forensic odontology; forensic dentistry; awareness on forensic odontology; dental students; dental faculty

1. Introduction

Forensic Odontology constitutes a rapidly developing branch of Forensic science, with immense importance in the examination of forensic dental evidence in legal circumstances and the identification of victims of mass disasters or abuse [1,2]. Forensic Odontology utilizes information from many dental disciplines (oral surgery, radiology, restorative dentistry, orthodontics, etc.) [13] and is primarily concerned with its use in legal contexts [3–5]. Nowadays, Forensic odontologists have become valuable members of forensic investigation teams [5–7].

Based on the durability of hard oral tissues, even when bodies are severely damaged, forensic dentists can assist in human identification, based on the fact that the morphology of the dentition is unique and no two oral cavities are alike [8,9]. Dental features such as tooth morphology and variations in shape and size, restorations and pathologies, missing teeth, wear patterns, color, position of teeth (crowding, rotations, etc.) and other dental characteristics give every individual a unique oral identity [10] and the comparison of ante- and post-mortem dental records continues to

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be one of the best and most frequently used methods in Forensic Odontology [12]. In the absence of latter, teeth can help in the determination of age, gender, race/ethnicity, habits and occupation, which can serve as additional clues regarding the identity of individuals [11].

Dental schools provide an opportunity for students to learn and be aware of the importance of keeping comprehensive and accurate dental records, which constitute a vital part for quality patient care and a fundamental of good clinical practice. Additionally, such records can be used for forensic and legal purposes [16]. Thus, exposure of undergraduate students to Forensic Odontology, highlights the professional obligation for accurate dental documentation and emphasizes its role in the identification of humans, as well as cases of abuse, violence or trauma, including child abuse [7,17]. Formal teaching in Forensic Odontology has existed for over 100 years and constitutes an integral part of undergraduate dental training [7,14]. Nevertheless, research among dental students reveals inadequate knowledge and lack of practice [15]. Providing proper relevant undergraduate training will enable future dentists to participate actively in the protection of vulnerable individuals in cases of abuse and the identification of mass disasters victims [18].

The aim of the present study was to investigate knowledge, attitudes, and practice relevant to Forensic Odontology among undergraduate dental students and faculty members of the School of Dentistry in European University Cyprus.

2. Materials and Methods

The data reported here were based on a cross-sectional survey conducted among 382 undergraduate Dental students and 71 full time and part time faculty at the School of Dentistry, European University Cyprus (EUC) which is at the moment the only accredited Dental institution in the Republic of Cyprus, and accepted its first cohort in 2017.

A self-administered, anonymous questionnaire in the English language, adapted from Abdul et al. [15] and Jayakumar et al. [10], was sent via e-mail to all participants. The survey was available on Google Forms (GDPR compliant) and required about 5 minutes to complete. The survey link remained accessible during the month of November 2022.

The survey comprised of two parts. In the first part, demographic information was obtained. The second part consisted of questions relevant to knowledge, attitudes and practice of Forensic Dentistry. The survey data were summarized by calculating frequencies for all variables (% percentages). To test the correlation of faculty answers with gender, age group, employment type, number of courses taught and the educational background (highest qualification), and student answers with gender, age group and year of study, Kendall's *tau* test was performed. To test the association of faculty answers with gender, age group, employment type, number of courses taught and the educational background (highest qualification), and student answers with gender, age group and year of study, x^2 test was performed. Furthermore, for the statistically significant associations, to measure the strength of association among the answers, Cramer's V was calculated. The observed significance levels (P-values) of statistical tests were predetermined at α=0.05 ($p \leq 0.05$) and were estimated by the Monte-Carlo simulation method [19]. All the analysis was performed using SPSS v.26.

3. Results

The survey was completed by 47 faculty members (66.2% response rate) and 304 students (80% response rate). The demographic characteristics of the respondents are presented in Table 1.

Table 1. Faculty members (n=47) and students (n=304) demographic characteristics.

Faculty [n (%)]	Students [n (%)]
Gender	**Gender**
25 (53.2%) Male	129 (42.4%) Male
22 (46.8%) Female	172 (56.6%) Female

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	3 (1.0%) Prefer not to say
Age group 10 (21.3%) 26-35 years-old 15 (31.9%)36-45 years-old 12 (25.5%) 46-55 years-old 10 (21.3%) >55 years-old	**Age group** 4 (1.3%) <18 163(53.6%) 18-21 years-old 100 (32.9%) 22-25 years-old 24(7.9%) 26-28 years-old 13 (4.3%) >28 years-old
Employment type 12 full-time (25.5%) 35 part-time (74.5%)	**Year of study** 59(19.4%) year 1 students 61 (20.1%) year 2 students 86 (28.3%) year 3 students 51 (16.8%) year 4 students 45 (14.8%) year 5 students 2 (0.7%) already hold a Dental Degree from another University and study in year 3,4,5
Number of courses taught 19 (40.4%) one course taught 17 (36.2%) two courses taught 5 (10.6%) three courses taught 6 (12.8%) four courses taught	
Educational background (highest qualification) 19(40.4%) possess a PhD 22 (46.8%) possess a Master 6(12.8%) possess a Bachelor Degree	

The answers of faculty members and students to the survey questions are presented in Table 2.

Table 2. Answers of faculty members (N=47) and students (N=304) to the survey questions.

Survey questions	Answers	Faculty [n (%)]	Students [n (%)]
Are you aware that the Forensic Odontology is a branch of dentistry?	Yes	41(87.2%)	197 (64.8%)
	No	6 (12.8%)	107 (35.2%)
Can teeth serve as source of DNA?	Yes	44 (93.6%)	257 (84.5%)
	No	0 (0%)	7 (2.3%)
	I do not know	3 (6.4%)	40 (13.2%)
How do you identify the dental age in children and adults?*	Eruption patterns and calcification	40 (85.1%)	248 (81.6%)
	Histological methods	24 (51.1%)	148 (48.7%)
	Biochemical methods	15 (31.9%)	94 (30.9%)
	I do not know	6 (12.8%)	45 (14.8%)
How will you identify a deceased person's age and gender in mass disasters?*	Reconstruct the fragmented deceased body	18 (38.3%)	111 (36.5%)
	Dental records	42 (89.4%)	221 (72.7%)
	Fingerprints	17 (36.2%)	98 (32.2%)
	I don't know	5 (10.6%)	56 (18.4%)
Is Forensic dentistry useful in identifying	Yes	46 (97.9%)	270 (88.8%)

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criminals and dead people?	No	0 (0%)	2 (0.7%)
	I do not know	1 (2.1%)	32(10.5%)
What is the study of lip prints in Forensic Dentistry called?	Lipology	1 (2.1%)	39 (12.8%)
	Cheiloscopy	18 (38.3%)	117 (38.5%)
	Dermatoglyphics	4 (8.5%)	18 (5.9%)
	I don't know	24 (51.1%)	130 (42.8%)
Are you aware of the significance of bite mark pattern of teeth?	Yes	40 (85.1%)	193 (63.5%)
	No	7 (14.9%)	111 (36.5%)
What is the source of your knowledge about Forensic Dentistry?*	Books	19 (40.4%)	59 (19.4%)
	Internet	18 (38.3%)	191 (62.8%)
	Workshops, seminars, lectures	29 (61.7%)	101 (33.2%)
	I don't have knowledge	7 (14.9%)	97(31.9%)
Do you think your knowledge and awareness about Forensic Odontology is enough?	Yes	4 (8.5%)	13 (4.3%)
	No	35 (74.5%)	263 (86.5%)
	I do not know	8 (17%)	28 (9.2%)
Are you interested to participate in workshops and seminars in Forensic Odontology?	Yes	31 (66%)	259 (85.2%)
	No	16 (34%)	45 (14.8%)
Do you maintain dental records in your clinic?[1]	Yes	37 (78.7%)	
	No	4 (8.5%)	
	N/A	6 (12.8%)	
Do you think meticulous dental record keeping is a significant component of quality patient care?[2]	Yes		237 (78%)
	No		9 (3%)
	Maybe		58(19.1)
How will you identify physical/neglected/sexual/psychological abuse of a child?	Physical injuries	0 (0%)	15 (4.9%)
	Behavioral changes	1 (2.1%)	10 (3.3%)
	Clothing	0 (0%)	3 (1%)
	Any scars	1 (2.1%)	1 (0.3%)
	All the above	45 (95.7%)	257 (84.5%)
	I do not know	0 (0%)	18 (5.9%)
What action would you take, if you identify child abuse?	Inform police	38 (80.9%)	258 (84.9%)
	Inform parents	9 (19.1%)	36 (11.8%)
	Take no action	0 (0%)	10 (3.3%)
Are you aware that you can testify as an expert witness in the court to present Forensic dental evidence?	Yes	30 (63.8%)	173 (56.9%)
	No	10 (21.3%)	85 (28%)
	N/A	7 (14.9%)	46 (15.1%)

*Multiple answers could be selected; [1]This question was addressed only to faculty; [2]This question was addressed only to students

Most respondents answered that Forensic Odontology is useful in identifying criminals and dead people; however, a significant percentage of students (35.2%) was not aware that Forensic Odontology is a branch of dentistry. Three faculty members (6.4%) and 40 students (13,2%) were not aware that teeth can serve as a source of DNA. Although most faculty (85.1%) and students (81.6%)

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stated that dental age could be identified by eruption pattern and calcification, many of them included biochemical and/or histological methods in their answers. The usefulness of dental records in the identification of a deceased person's age and gender in mass disasters was highlighted by most faculty members (78.7%) and students (78%). Many faculty (61.7%) and students (61.5%) could not identify correctly the study of lip prints in Forensic Odontology as cheiloscopy, but the majority (63.5% of the students and 85.1% of the faculty) were aware of the significance of bite mark pattern. Interestingly, 74.5% of the faculty and 86.5% of the students did not have any knowledge about Forensic Odontology. However, only 66% of the faculty were willing to participate in workshops and seminars on the subject. Nearly 79% of the faculty keep records in their clinic. A percentage of 78% of the students believed that dental record keeping is a significant component of quality patient care. Nearly all faculty members (95.7%) stated that child abuse cases can be identified by physical injuries, scars, clothing and behavioral changes. The majority of students (84.5%) answered similarly. Regarding actions in child abuse cases, 80.9% of the faculty were in favor of reporting to the police, while 19.1% preferred reporting to the parents. Students' answers were similar. Most faculty (63.8%) and students (56.9%) were aware that a dentist can testify as expert witness in a court of law with forensic dental evidence.

The correlations of faculty and student answers to the second part of the survey with the demographic characteristics are presented in Tables 3 and 4.

Table 3. Correlations of faculty answers to survey questions with demographic characteristics *.

	Gender	**Age group**	**Employment type**	**Number of courses taught**	**Educational background**
Are you aware that the Forensic Odontology is a branch of dentistry?	tau=0.103 p=0.484	tau=0.043 p=0.770	tau=0.078 p=0.598	tau=0.021 p=0.879	tau=-0.111 p=0.431
Can teeth serve as source of DNA?	tau=0.071 p=0.632	tau=0.136 p=0.357	tau=-0.153 p=0.300	tau=0.181 p=0.187	**tau=0.284 p=0.045**
Is Forensic dentistry useful in identifying criminals and dead people?	tau=0.138 p=0.348	tau=0.077 p=0.603	tau=-0.086 p=0.558	tau=-0.151 p=0.272	tau=0.074 p=0.599
What is the study of lip prints in Forensic Dentistry called?	tau=0.032 p=0.822	tau=-0.020 p=0.885	tau=0.040 p=0.776	tau=0.135 p=0.306	*tau*=-0.075, *p*=0.582
Are you aware of the significance of bite mark pattern of teeth?	tau=-0.087 p=0.557	tau=-0.211 p=0.135	tau=0.029 p=0.843	tau=0.164 p=0.233	*tau*=-0.009, *p*=0.948
Do you think your knowledge and awareness about Forensic Odontology is enough?	tau=0.239 p=0.096	tau=-0.007 p=0.959	tau=-0.101 p=0.482	tau=0.203 p=0.129	*tau*=-0.190, *p*=0.168
Are you interested to participate in workshops and seminars in Forensic Odontology?	tau=0.134	tau=0.264	tau=0.197	tau=0.113	*ta*u=0.031

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	p=0.363	p=0.074	p=0.181	p=0.410	*p*=0.824
Do you maintain dental records in your clinic?	tau=0.187 p=0.194	tau=-0.113 p=0.434	tau=0.032 p=0.824	tau=-0.083 p=0.537	**tau=0.317 p=0.022**
How will you identify physical/neglected/sexual/psychological abuse of a child?	tau=0.197 p=0.180	tau=0.109 p=0.457	tau=-0.123 p=0.403	tau=0.054 p=0.695	tau=-0.065 p=0.644
What action would you take, if you identify child abuse?	tau=0.131 p=0.373	tau=-0.011 p=0.939	tau=0.087 p=0.555	tau=0.075 p=0.585	tau=0.019 p=0.894
Are you aware that you can testify as an expert witness in the court to present Forensic dental evidence?	tau=0.005 p=0.970	tau=-0.052 p=0.715	tau=-0.251 p=0.076	tau=-0.024 p=0.854	tau=0.061 p=0.652

*Questions allowing single answers only. Statistically significant p-values in bold.

Table 4. Correlations of student answers to survey questions with demographic characteristics *.

	Gender	**Age group**	**Year of study**
Are you aware that the Forensic Odontology is a branch of dentistry?	tau=-0.020 p=0.723	**tau=-0.144 p=0.009**	**tau=-0.264 p<0.001**
Can teeth serve as source of DNA?	tau=0.013 p=0.821	**tau=-0.135 p=0.045**	tau=-0.083 p=0.104
Is Forensic dentistry useful in identifying criminals and dead people?	**tau=0.126 p=0.027**	**tau=-0.135 p=0.013**	**tau=-0.102 p=0.048**
What is the study of lip prints in Forensic Dentistry called?	tau=0.039 p=0.467	tau=-0.030 p=0.555	**tau=-0.158 p=0.001**
Are you aware of the significance of bite mark pattern of teeth?	tau=-0.030 p=0.596	tau=-0.009 p=0.870	tau=-0.047 p=0.366
Do you think your knowledge and awareness about Forensic Odontology is enough?	tau=0.105 p=0.061	tau=-0.064 p=0.238	tau=-0.041 p=0.414
Are you interested to participate in workshops and seminars in Forensic Odontology?	**tau=0.207 p<0.001**	tau=-0.016 p=0.765	tau=-0.058 p=0.257
Do you think meticulous dental record keeping is a significant component of quality patient care?	tau=0.077 p=0.173	**tau=-0.129 p=0.017**	tau=-0.076 p=0.136
How will you identify physical/neglected/sexual/psychological abuse of a child?	**tau=0.123 p=0.028**	tau=-0.099 p=0.062	tau=-0.071 p=0.155
What action would you take, if you identify child abuse?	tau=0.077 p=0.173	tau=0.065 p=0.230	tau=-0.028 p=0.576
Are you aware that you can testify as an expert witness in the court to	tau=0.024	**tau=-0.128**	tau=-0.038

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present Forensic dental evidence?	p=0.644	**p=0.014**	p=0.446

*Questions allowing single answers only. Statistically significant p-values in bold.

Positive, weak, and statistically significant relationships were observed between educational background and the answers of the faculty to the questions "Can teeth serve as source of DNA?" and "Do you maintain dental records in your clinic?" (Table 3).

Students' gender showed a positive, weak, and statistically significant correlations with the answers to the questions "Is Forensic Dentistry useful in identifying criminals and the dead people?", "Are you interested to participate in workshops and seminars in Forensic Odontology?", and "How will you identify physical/neglected/sexual/psychological abuse of a child". A negative, weak and statistically significant relationship was observed between the gender and the answers to the question "Do you know about Forensic Odontology as a branch in Dentistry?". Moreover, the age group students belonged to, presented negative, weak, and statistically significant relationships with the answers to the questions "Do you know about Forensic Odontology as a branch in dentistry?", "Can teeth serve as source of DNA?", "Is Forensic Dentistry useful in identifying criminals and the dead people?", "Do you think meticulous dental record keeping is a significant component of quality patient care?" and "Are you aware that you can testify as an expert witness in the court to present Forensic dental evidence?". Finally, students' year of study exhibited negative, weak and statistically significant relationships with the answers to the questions "Do you know about Forensic Odontology as a branch in dentistry?", "Is Forensic Dentistry useful in identifying criminals and the dead people?" and "What is the study of lip prints in Forensic Dentistry called?" (Table 4).

The association of faculty answers with gender, age group, employment type, number of courses taught and the educational background (highest qualification) is presented in Table 5. According to the results of the X^2 test, no statistically significant associations were noted.

Table 5. Statistical significance difference levels of the X^2 test associations of faculty answers to survey questions with demographic characteristics *.

	Gender	Age group	Employment type	Number of courses taught	Educational background
Are you aware that the Forensic Odontology is a branch of dentistry?	0.670	1.000	0.678	0.812	0.717
Can teeth serve as source of DNA?	1.000	0.589	0.560	0.382	0.095
Is Forensic dentistry useful in identifying criminals and dead people?	1.000	1.000	1.000	1.000	1.000
What is the study of lip prints in Forensic Dentistry called?	0.855	0.731	0.206	0.248	0.171
Are you aware of the significance of bite mark pattern of teeth?	0.690	0.155	0.842	0.539	1.000
Do you think your knowledge and awareness about Forensic Odontology is enough?	0.273	0.504	0.739	0.285	0.143
Are you interested to participate in workshops and seminars in Forensic Odontology?	0.538	0.131	0.289	0.583	1.000
Do you maintain dental records in your clinic?	1.000	1.000	0.559	0.055	0.060
How will you identify physical/neglected/sexual/psychological abuse of	1.000	1.000	1.000	0.418	0.788

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a child?					
What action would you take, if you identify child abuse?	0.470	1.000	0.674	0.227	0.592
Are you aware that you can testify as an expert witness in the court to present Forensic dental evidence?	1.000	1.000	0.693	1.000	0.391

*Questions allowing single answers only.

The association of student answers with gender, age group and year of study is presented in Table 6.

Table 6. Statistical significance difference levels of the X^2 test associations of student answers to survey questions with demographic characteristics.*.

	Gender	**Age group**	**Year of study**
Are you aware that the Forensic Odontology is a branch of dentistry?	0.807	**0.008**	**<0.001**
Can teeth serve as source of DNA?	0.198	0.435	0.933
Is Forensic dentistry useful in identifying criminals and dead people?	**0.033**	0.163	0.103
What is the study of lip prints in Forensic Dentistry called?	0.441	0.857	**0.012**
Are you aware of the significance of bite mark pattern of teeth?	0.630	0.902	0.117
Do you think your knowledge and awareness about Forensic Odontology is enough?	0.080	0.606	0.756
Are you interested to participate in workshops and seminars in Forensic Odontology?	**<0.001**	0.122	**<0.001**
Do you think meticulous dental record keeping is a significant component of quality patient care?	0.431	0.118	0.212
How will you identify physical/neglected/sexual/psychological abuse of a child?	0.067	0.240	0.065
What action would you take, if you identify child abuse?	0.453	0.526	0.148
Are you aware that you can testify as an expert witness in the court to present Forensic dental evidence?	0.706	0.506	0.981

*Questions allowing single answers only. Statistically significant p-values in bold.

According to the results of the X^2 test, gender was associated with the answers to the questions "Is forensic Dentistry useful in identifying criminals and the dead people?" ($p=0.033$) and "Are you interested to participate in workshops and seminars in forensic odontology?" ($p<0.001$). In both questions, the positive answers from females were statistically significantly more (Table 7).

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Table 7. Distribution of answers to the questions "Is forensic Dentistry useful in identifying criminals and the dead people?" and "Are you interested to participate in workshops and seminars?" according to the students' gender.

	Is forensic Dentistry useful in identifying criminals and the dead people?				Are you interested to participate in workshops and seminars?		
Gender	**Yes**	**No**	**I don't know**	**Total**	**Yes**	**No**	**Total**
Female	159 (92.4%)	1 (0.6%)	12 (7.0%)	172 (100%)	158 (91.9%)	14 (8.1%)	172 (100%)
Male	108 (83.7%)	1 (0.8%)	20 (15.5%)	129 (100%)	98 (76.0%)	31 (24.0%)	129 (100%)
Total	267 (88.7%)	2 (0.7%)	32 (10.6%)	301 (100%)	256 (85.0%)	45 (15.0%)	301 (100%)

Moreover, a statistically significant association was observed between students' age group and the answers to the question "Do you know about forensic odontology as a branch in dentistry?" (p=0.008). The majority of students aged from 22 to 28 years old, knew about the forensic odontology as a branch in dentistry, compared to younger students from 18 to 21 years old and students older than 28 years old (Table 8).

Table 8. Distribution of the answers for the question "Do you know about forensic odontology as a branch in dentistry?" according to the students' age group.

Age group	**Yes**	**No**	**Total**
18-21	92 (56.3%)	71 (43.6%)	163 (100%)
22-25	73 (73.0%)	27 (27.0%)	100 (100%)
26-28	20 (83.3%)	4 (16.7%)	24 (100%)
>28	8 (61.5%)	5 (38.5%)	13 (100%)
Total	193 (64.3%)	107 (35.7%)	300 (100%)

Finally, statistically significant associations were noted between students' year of study and the answers for the questions "Do you know about forensic odontology as a branch in dentistry?" ($p<0.001$), "What is the study of lip prints in forensic Dentistry called?" ($p=0.012$), and "Are you interested to participate in workshops and seminars in forensic odontology?" ($p<0.001$). As the year of study increased, more students knew about forensic odontology as a branch in dentistry (Table 9).

Table 9. Distribution of the answers for the following question "Do you know about forensic odontology as a branch in dentistry?" according to the students' year of study.

Year of study	**Yes**	**No**	**Total**
1st	25 (42.4%)	34 (57.6%)	59 (100%)
2nd	34 (55.7%)	27 (44.3%)	61 (100%)
3rd	59 (68.6%)	27 (31.4%)	86 (100%)
4th	40 (78.4%)	11 (21.6%)	51 (100%)
5th	37 (82.2%)	8 (17.8%)	45 (100%)
Total	195 (64.6%)	107 (35.4%)	304 (100%)

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According to the results of the X^2 test (Table 10) most of the students at the first, the third and the fourth year of study did not know how the lip prints in forensic Dentistry are called, while most of the students at the second, and the fifth year of study, knew that is called cheiloscopy.

Table 10. Distribution of the answers for the following question "What is the study of lip prints in forensic Dentistry called?" according to the students' year of study.

Year of study	Dermatoglyphics	Cheiloscopy	Lipology	I do not know	Total
1st	2 (3.4%)	14 (23.7%)	13 (22.0%)	30 (50.8%)	59 (100%)
2nd	4 (6.6%)	27 (44.3%)	9 (14.8%)	21 (34.4%)	61 (100%)
3rd	4 (4.7%)	32 (37.2%)	8 (9.3%)	42 (48.8%)	86 (100%)
4th	3 (5.9%)	17 (33.3%)	4 (7.8%)	27 (52.9%)	51 (100%)
5th	5 (11.1%)	25 (55.6%)	5 (11.1%)	10 (22.2%)	45 (100%)
Total	18 (6.0%)	115 (38.1%)	130 (43.0%)	39 (12.9%)	304 (100%)

Many students in the first and fourth year of study were interested to participate in workshops and seminars in forensic odontology, while almost all students in the second, third and fifth year were interested to participate in workshops and seminars in forensic odontology (Table 11).

Table 11. Distribution of the answers for the following question "Are you interested to participate in workshops and seminars in forensic odontology?" according to the students' year of study.

Year of study	Yes	No	Total
1st	44 (74.6%)	15 (25.4%)	59 (100%)
2nd	53 (86.9%)	8 (13.1%)	61 (100%)
3rd	83 (96.5%)	3 (3.5%)	86 (100%)
4th	36 (70.6%)	15 (29.4%)	51 (100%)
5th	41 (91.1%)	4 (8.9%)	45 (100%)
Total	257 (85.1%)	45 (14.9%)	304 (100%)

4. Discussion

Each year, different natural disasters, accidents, and malevolent acts result in the deaths of thousands, leaving behind numerous unidentified victims [25]. The oral health profession holds a significant role in supporting forensic investigations by aiding in victim identification. Forensic Odontology, the specialized branch of dentistry dedicated to this purpose, remains invaluable in human identification processes, largely due to the distinct nature of oral hard tissue anatomical features [1,20]. For oral health professionals to contribute effectively, awareness about this dentistry branch is essential within the dental community.

In our study within Cyprus, we evaluated the awareness, knowledge, attitudes, and practices pertaining to Forensic Odontology among faculty and undergraduate students at the School of Dentistry, European University Cyprus. This institution, established and accredited within the European Union in 2017, represents the sole academic body in the Republic of Cyprus offering a Bachelor of Dental Surgery program. This 5-year curriculum encompasses an elective "Legal and Forensic Dentistry" course introduced during the fourth academic year.

A significant portion of our respondents—87% of faculty and 65% of students—were cognizant of Forensic Odontology as a dental specialization. Our findings resonate with studies from Saudi Arabia that reported awareness levels ranging from 62.5% to 78.4% [5,21], but considerably exceed awareness levels among Indian dentists [22]. The awareness levels among students align closely with results from analogous studies [15,22].

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Eighty five percent of our student respondents recognized teeth as a DNA source, a figure that surpasses results from Abdul et al., which ranged from 40% to 75% across different educational levels [15]. Faculty awareness in our study stood at 94%, mirroring the findings from Sahni et al., where 95% of 200 dental faculty members acknowledged this fact [7]. Furthermore, our study revealed a positive, weak, and statistically significant correlation between faculty's academic qualifications and their awareness levels, something also found in the question for maintaining Dental records in their private clinic. A majority of our faculty (97.9%) and students (88.8%) agreed on the utility of Forensic Odontology in identifying both criminals and deceased individuals. These statistics are comparable to those from a study in Saudi Arabia, which reported 95% awareness among students [15].

Concerning the awareness of the methods used for dental age identification in children and adults, our results (15% for students and 13% for faculty did not know how to identify/estimate dental age) appeared modest compared to the 25% awareness recorded by Abdul et al. [15]. While DNA profiling, fingerprints, anthropometric data and dental records remain the predominant methods for human identification, supplementary techniques such as cheiloscopy, palatoscopy and other odontometric measurements yield reliable outcomes when systematically employed. Regarding cheiloscopy, which studies the unique patterns of "lip prints," i.e. the elevations and depressions of the external surface of the lips, our results (38.3% for faculty and 38.5% for students) align closely with others' findings among dental professionals and dental students [15]. It is interesting to note that a percentage of 51% of the faculty answered "I do not know how the study of lip prints is called" whereas this percentage was 42,8% for the students.

We observed varied awareness levels regarding the significance of bite mark patterns in teeth with a percentage of 85.1% for faculty and 63.5% for students. Studies from India and Pakistan reported ignorance levels of 32% and 48%, respectively [22,23]. In contrast, a study in Saudi Arabia highlighted that 87.5% of postgraduate students, 50% of graduate students, and 27.3% of undergraduates recognized its importance in Forensic Odontology.

The primary awareness sources diverged for students and faculty, with the former relying on the internet and the latter on books and lectures. Both groups self-assessed their knowledge as limited, a sentiment echoed in other studies [15,24]. The inclination to attend Forensic Odontology workshops and seminars was evident, with 66% faculty interest (lower than other studies) and 85.2% student interest (similar to other studies) [7,12,15,23,24].

Patient records, while essential for quality care and legal prerequisites, also serve as valuable tools in Forensic Odontology [26]. Our findings showed that a significant 80% of faculty maintain these records, aligning more with the 90% reported by Savić Pavičin et al. in Croatia [17]. In another study carried out by Preethi et al. only 12% maintained a complete dental record and 21% did not maintain any record, while 93% of the dentists did not preserve a record for more than 7 years [12]. Astekar et al. found that only 38% of dentists retain records whereas 62% did not maintain any record [27]. Waleed et al. in another study observed accurate maintenance of dental records is more prominent among dental students in relation to private practitioners [28]. In our study, the students believe that meticulous dental record keeping is a significant component of quality patient care in a percentage of 78%.

Addressing the grave issue of child abuse, a serious social problem increasing at an alarming rate globally, early identification is of paramount importance [7]. In our study, we found high awareness levels as nearly 96% of faculty and 85% of students agreed that child abuse cases can be identified by physical injuries, scars, clothing, and behavioral changes. These figures markedly contrast with Abdul's findings, wherein only 25% of respondents recognized these indicators and 12.5% did not know how to identify child abuse [15], when in our study the same measure was 5.9%.

In addressing the issue of child abuse reporting, our findings offer some optimism. Among our participants, 81% of faculty and 85% of students would report suspected child abuse to the police. In comparison, a distinct study reported a considerably lower percentage of 25% taking similar action. Disturbingly, 3% of our student participants would abstain from any action, albeit this is an improvement from the 12.5% reported in Abdul's Riyadh-based study [15]. A survey from India indicated that 41% of dental teaching staff would prefer to report suspicions directly to the child's

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parents [7]. Our data show lower figures with only 20% of faculty and 12% of students choosing this course of action. It is important to highlight the absence of a dedicated on-site social worker at our institution to promptly address child abuse suspicions, which would arguably be a preferred initial step before police or family involvement. The intricate nature of domestic violence, often occurring within family confines, warrants careful handling. Directly notifying parents without comprehensive case assessment might exacerbate the situation rather than alleviate it.

On another front, 64% of faculty and 57% of students in our study were aware of the role dentists can play in the legal system, specifically in providing expert testimonies and presenting forensic dental evidence in court. By contrast, Abdul et al.'s study exhibited a higher awareness at 85% [15].

Forensic Odontology, while well-explored globally, remains under-researched in Cyprus. To date, its application in Cyprus has primarily been via coroners, with government dentists consulted on a need basis. A poignant case that accentuates its importance was the Helios Airways Flight 522 tragedy in 2005, with 121 passengers and crew killed and burnt, where dental professionals played an instrumental role in victim identification. In that case, dental records were requested form the victims' dentists in Cyprus and Greece and Forensic Odontology specialists from the Department of Dentistry of the School of Health Sciences of the National and Kapodistrian University of Athens, worked on identification.

Our study stands as a seminal exploration into Forensic Odontology awareness among faculty and undergraduate dental students in Cyprus. An argument could be made for rendering "Legal and Forensic Dentistry" a mandatory course, ensuring universal student exposure.

Limitations of this study include its confinement to a single Cypriot dental school. Further expansive research, encompassing multiple regions and larger sample sizes, as well as awareness assessment in the dental community is recommended.

5. Conclusions

The survey underscored a robust awareness of Forensic Odontology among respondents. Despite faculty's comprehensive understanding, there's a pronounced need to bolster their inclination towards attending relevant seminars. Emphasis on improved record-keeping practices for potential forensic applications is paramount.

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