

Research Article

Competency Assessment of Final-Year Dental Students in Tunisia

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Introduction. The educational program assessment has always been the main objective of quality improvement in all curricula. The aim of this study was to describe the levels of competency of final-year students of the Faculty of Dental Medicine of Monastir in Tunisia in the major skills needed for a new dentist. **Methods.** In this cross-sectional descriptive study, 154 students filled out a questionnaire including 53 competencies, rated on a four-point Likert scale, broadly based on the competencies described in the profile and competences for the graduating dentist in Europe. **Results.** The response rate was 67% (145/230). For twenty items in the questionnaire, over 75% of the students reported being competent. The five items with the highest percentages were “undertaking supragingival and subgingival scaling-Item 22” (97.2%), “evaluating the periodontium, establishing a diagnosis and formulating a treatment plan-Item 2” (96.6%), “identify the location and degree of activity of dental caries-Item 24 (95.9%), “taking and interpreting dental radiographs-Item 12” (94.4%), “restoring damaged teeth-Item 25” (93.8%), and “managing primary oral health care-Item 16” (93.8%). For eighteen skills, more than 75% of students self-rated being not competent, demonstrating a need of more thorough training, notably in periodontal surgery and implantology, among these, five skills were found that demand in-depth acquisition according to the students. **Conclusion.** The general state of competency of the last-year dental students was described as fairly satisfactory based on the students’ self-reported responses. However, theoretical and practical backgrounds related to some subjects in the school need to be improved.

1. Introduction

Educational institutes should develop dentists equipped with the competences to successfully cope with the clinical reality of the profession in everyday practice in order to improve and ensure a high quality of dental health care [1].

Multiple teaching strategies are used by the dental schools such as theoretical, preclinical, and clinical education, and assessment of these strategies has a very important and crucial role in evaluating the efficiency of the provided education methods and the achievement of the intended learning outcomes of future graduate dentists [1, 2]. A graduate dentist must be competent in a broad variety of skills, including investigative, analytical, problem solving, planning, communication, team building, and leadership skills and has to demonstrate a contemporary knowledge and understanding of the broader issues of dental practice [2].

The dental curriculum in Tunisia is essentially based on individual disciplines centered on integrated patient care. The effectiveness of such curriculum in training students in a wide range of dental competencies was questioned [3]. For this reason, to be able to obtain the accreditation and to be aligned with other curricula adopted by numerous schools of dentistry, especially, European dental schools, the school board has decided to change the old learning methods and to adopt new methods involving student-centered learning. This decision required some evaluations and processes of both internal and external assessment were then been put in place in our school and the present study was part of this evaluation.

The main objectives of this study were to describe levels of self-rated competency of final-year dental students at the Faculty of Dental Medicine of Monastir (Tunisia) and to highlight competencies which are perfectly mastered at the

end of the undergraduate programme and those which are not in order to improve the training given within the school.

2. Methods

2.1. Study Population. The present cross-sectional study was conducted on a sample of final-year dental students from the Faculty of Dental Medicine of Monastir, Tunisia. Data were collected using a self-administered questionnaire from 230 dental students in five departments where they were assigned during the last month of their academic year. Only students having completed their 5 years of study at the Faculty of Dental Medicine of Monastir were included in our survey; students having studied in foreign universities were excluded. The study was conducted in September 2018, the last week of internship and dental study program.

Ethical approval was obtained from the Faculty of Dental Medicine of Monastir and the Dental Clinic of Monastir. A cover letter was sent with the questionnaire to all the heads of departments explaining the purpose of the study, inviting participation and indicating that data would be analyzed and presented anonymously. From a total of 230 final-year dental students, 154 participated voluntarily in the present study.

2.2. Questionnaire. A self-administered questionnaire was used in this study; this questionnaire was broadly based on the competencies that were described in the "Profile and Competences for the Graduating Dentist in Europe" [2] adapted from the list of competences of the European dentist defined by the DentEd Network and approved by the General Assembly of the Association for Dental Education in Europe at its annual meeting held in Helsinki in August 2009.

The questionnaire was distributed in French language and developed in three parts. The first part asked for the participating dentist's gender (male or female), year of birth, assigned department, and repeated grades (4th grade, 5th grade, 4th and 5th grade).

The second part required respondents to self-rate their competencies. This part described the competences for the graduating dentist and included 53 competency items covering areas related to seven domains and rated on a 4-level Likert scale: to 4 (very competent)-1 (not at all competent). For each item, the respondent can tick a box called "do not know" if he/she does not want to answer or if he/she was unable to self-assess his/her competency in that field.

The items-covered areas related to (I) professionalism, (II) interprofessional, communication, and skills, (III) knowledge base, information, and information literacy, (IV) clinical information gathering, (V) diagnosis and treatment planning, (VI) therapy, and (VII) prevention and oral health promotion. And they were regrouped into different aspects of dental practice: "general patient management," "practice management," "periodontology," "dental public health," "conservative dentistry," "oral rehabilitation," "orthodontics," "managing children and special-needs patients," "oral surgery," and "drug and emergency management."

In the third part, respondents were asked to highlight the five skills which according to them needed to be more

improved during the program. They were asked to classify each of the five skills from the one which needs the most improvement to the one which needs the least.

An open question in which the respondent could express him/herself freely and report any additional required competencies to practice dentistry in Tunisia ended the questionnaire. The questionnaire was parceled out on paper, and all the replies were anonymous and confidential.

A pilot study was conducted prior to data collection. No significant issues were identified, and minor modifications were made to clarify survey instructions.

2.3. Data Analysis. Statistical analyses were performed using SPSS version 22.0. For each skill, the percentages of respondents who rated themselves as very competent, competent, and rather and quite incompetent were calculated.

In order to separate possible ex aequos, for each competency, a percentage of excellence or of high difficulty has been calculated. The percentage of excellence/high difficulty is the percentage of respondents judging themselves to be very competent/very incompetent out of the percentage of total competences.

To investigate associations between the percentages of competencies and students' gender and repeated grades, responses were combined into two categories "competent" and "not competent" and chi-square test was used. A *P* value of 0.05 and less was considered significant.

To highlight the five skills the respondents wanted to improve, two scores were calculated: an impact score and a quotation score. The impact score was calculated by giving each respondent one point for the skill which needed to be the least improved to five points for the one which needed to be the most improved. The quotation score was calculated by giving one point each time a skill was cited by a respondent.

3. Results

At the time of the survey, 230 final-year dental students were at the Faculty of Dental Medicine of Monastir. 154 of the 230 contacted students returned a completed questionnaire, resulting in a response rate of 67%; 102 (66.3%) were females and 52 (33.76%) were males with a sex ratio of 0.49. The students' age varied between 24 and 29 years; the mean age was 24.96 years \pm 0.112 for females and 25.5 years \pm 0.208 for males.

Five students have repeated the 5th grade, four the 4th grade and four students have repeated the 4th and 5th grade.

Table 1 shows the percentage for self-rated competency for twenty items in the questionnaire, for which over 75% of students report being competent and very competent and their association with the demographic variables.

The five items with the highest percentages were "undertaking supragingival and subgingival scaling and root debridement-Item 22" (97.2%), "evaluating the periodontium, establishing a diagnosis and formulating a treatment plan-Item 2" (96.6%), "identify the location, extent, and degree of activity of dental caries-Item 24 (95.9%), "taking and interpreting dental radiographs-Item 12" (94.4%), "restoring diseased and damaged teeth-Item 25"

TABLE 1: Self-assessed skills well required at the end of the curriculum and their association with demographic variables.

	Competency item	Competency assessment					Sex	Repeated grades
		Very competent N (%)	Competent N (%)	Not competent N (%)	Not at all competent N (%)	Do not know N (%)	P value	P value
1	C22: undertaking supragingival and subgingival scaling and root debridement	67 (46.5)	73 (50.7)	3 (2.1)	0 (00)	1 (0.7)	0.235	0.369
2	C2: evaluating the periodontium, establishing a diagnosis, and formulating a treatment plan	67 (46.2)	73 (50.4)	5 (3.4)	0 (00)	0 (00)	0.041	0.138
3	C24: identifying the location, extent and degree of activity of dental caries and tooth wear	71 (49)	68 (46.9)	5 (3.4)	0 (00)	1 (0.7)	0.693	0.179
4	C12: taking and interpreting dental radiographs	30 (21)	105 (73.4)	6 (4.2)	2 (1.4)	2 (1.4)	0.710	0.048
5	C25: restoring diseased and damaged teeth	59 (40.7)	77 (53.1)	7 (4.8)	1 (0.7)	1 (0.7)	0.897	0.073
6	C16: educating patients and managing primary oral health care	55 (37.9)	81 (55.9)	8 (5.5)	1 (0.7)	0 (0.0)	0.299	0.187
7	C29: performing uncomplicated extraction of erupted teeth	77 (53.1)	56 (38.6)	8 (5.5)	2 (1.4)	2 (1.4)	0.476	0.001
8	C7: sharing information and professional knowledge with both the patient and other professionals	42 (29)	91 (62.8)	10 (6.9)	1 (0.7)	1 (0.7)	0.098	0.466
9	C35: conducting and discussing planning of restorative and prosthetic treatment	33 (22.8)	100 (69)	10 (6.9)	0 (00)	1 (0.7)	0.746	0.014
10	C50: providing urgent dental treatment	36 (24.8)	97 (66.9)	9 (6.2)	3 (2.1)	0 (00)	0.692	0.494
11	C6: identifying patient expectations, desires, and attitudes	48 (33.1)	84 (57.9)	11 (7.6)	1 (0.7)	1 (0.7)	0.543	0.257
12	C4: recognizing clinical limitations and knowing when to refer appropriately	63 (43.4)	67 (46.2)	9 (6.2)	6 (4.2)	0 (00)	0.035	0.234
13	C42: performing a temporary prosthesis (crown, bridge)	33 (22.8)	95 (65.5)	15 (10.3)	2 (1.4)	0 (00)	0.443	0.150
14	C1: protecting confidential patient data	49 (33.8)	78 (53.8)	13 (8.9)	5 (3.4)	0 (00)	0.421	0.018
15	C26: performing endodontic treatment on uncomplicated single and uncomplicated multirrooted teeth	42 (29)	84 (57.9)	13 (9)	6 (4.)	0 (00)	0.374	0.066
16	C9: identifying the chief complaint of the patient and obtaining a history of the present illness complaint	38 (26.2)	86 (59.3)	15 (10.3)	6 (4.2)	0 (00)	0.031	0.383
17	C52: prescribing appropriate pharmaceutical agents	23 (15.9)	100 (69)	19 (13.1)	3 (2.1)	0 (00)	0.694	0.484
18	C36: making one anterior or posterior crown	18 (12.4)	104 (71.7)	18 (12.4)	5 (3.4)	0 (00)	0.726	0.390
19	C10: producing a patient record and maintaining an accurate record of patient treatment	33 (22.8)	88 (60.7)	14 (9.7)	10 (6.9)	0 (00)	0.410	0.008
20	C33: administering infiltration and block local anaesthesia	24 (16.6)	97 (66.9)	20 (13.8)	4 (2.8)	0 (00)	0.555	0.243
21	C40: designing effective complete dentures	24 (16.6)	91 (62.8)	24 (16.6)	3 (2.1)	3 (2.1)	0.406	0.067

Note. Bold values indicate $P < 0.05$.

(93.8%), and “educating patients and managing primary oral health care-Item 16” (93.8%).

Table 2 shows the percentages for self-rated competency for fifteen items in the questionnaire, for which between 50% and 75% of students report being competent and their association with the demographic variables.

Table 3 shows the percentages for self-rated competency for eighteen items in the questionnaire, for which students report being not competent and their association with demographic variables.

The five items which have obtained the lowest scores were “performing soft tissue diagnostic procedures-Item 20” (77.9%), “performing in usual periodontal surgical procedures-Item 23” (66%), “performing dental implant prosthesis-Item 44” (58.6%), “managing orofacial pain, including TMJ/occlusion disorders, discomfort, and psychological distress-Item 46” (37.9%), and “performing surgical extraction-Item 30” (37.2%). These five skills are those listed by the respondents among the five skills needed to be improved (Table 4).

TABLE 2: Self-rated skills moderately acquired at the end of the curriculum and their association with demographic variables.

	Competency item	Competency assessment					Sex	Repeated grades
		Very competent <i>N</i> (%)	Competent <i>N</i> (%)	Not competent <i>N</i> (%)	Not at all competent <i>N</i> (%)	Do not know <i>N</i> (%)	<i>P</i> value	<i>P</i> value
1	C41: restoring proper occlusal vertical dimension	18 (12.4)	92 (63.4)	30 (20.4)	4 (2.8)	1 (0.7)	0.549	0.194
2	C14: establishing a multidisciplinary treatment plan	16 (11)	93 (64.1)	31 (21.4)	3 (2.1)	1 (0.7)	0.484	0.450
3	C47: diagnosing orthodontic treatment need	22 (15.2)	82 (56.6)	28 (19.3)	13 (8.9)	0 (00)	0.154	0.413
4	C3: displaying appropriate professional behaviour towards all members of the dental team	27 (18.6)	77 (53.1)	27 (18.6)	11 (7.6)	3 (2.1)	0.339	0.420
5	C37: performing a coronoradicular reconstitution	14 (9.1)	88 (60.7)	35 (24.1)	8 (5.6)	0 (00)	0.862	0.103
6	C39: designing effective partial dentures	23 (15.8)	88 (60.6)	27 (18.6)	6 (4.2)	1 (0.7)	0.343	0.041
7	C27: managing pulpal and periradicular disease and disorders	30 (20.7)	70 (48.3)	39 (26.9)	5 (3.4)	0 (00)	0.594	0.010
8	C45: treating children	24 (16.6)	76 (52.4)	34 (23.4)	8 (5.5)	3 (2.1)	0.017	0.400
9	C38: designing effective post crowns and bridges	11 (7.6)	83 (57.2)	45 (31)	4 (2.8)	2 (1.4)	0.458	0.400
10	C13: indicating appropriate clinical laboratory and other diagnostic procedures and tests	12 (8.3)	80 (55.2)	45 (31)	5 (3.4)	3 (2.1)	0.477	0.250
11	C17: providing oral hygiene instruction, topical fluoride therapy, and fissure sealing	16 (11)	73 (50.3)	41 (28.3)	14 (9.6)	1 (0.7)	0.312	0.146
12	C49: applying the principles of health promotion and disease prevention	16 (11)	70 (48.6)	44 (30.6)	15 (10.3)	0 (00)	0.860	0.008
13	C11: managing and avoiding the hazards of ionising radiation	19 (13.1)	58 (40)	42 (29)	26 (17.9)	0 (00)	0.985	0.160
14	C53: treating patients with special needs	11 (7.6)	64 (44.1)	54 (37.2)	16 (11)	0 (00)	0.020	0.480

Note. Bold values indicate $P < 0.05$.

Female students, compared to males, felt more competent in “evaluating the periodontium, establishing a diagnosis and formulating a treatment plan-Item 2” ($P < 0.05$), “treating children-Item 45” ($P < 0.05$), and “treating patients with special needs-Item 54” ($P < 0.05$).

Students who repeated at least one grade felt more competent in “taking and interpreting dental radiographs-Item 12” ($P < 0.05$), “performing uncomplicated teeth extraction-Item 29” ($P < 0.05$), “conducting and discussing planning of restorative and prosthetic treatment-Item 35” ($P < 0.05$), “producing a patient record and maintaining an accurate record of patient treatment-Item 10” ($P < 0.05$), “designing effective partial dentures-Item 39” ($P < 0.05$), “managing pulpal and periradicular disease and disorders-Item 27” ($P < 0.05$), and “applying the principles of health promotion and disease prevention-Item 49” ($P < 0.05$).

4. Discussion

For a dental school, assessing the quality of its undergraduate courses is crucial because it should continuously wonder if its young graduates’ profile meets the population’s

health needs. In the present study, the final-year students of a dental school assessed their professional skills to highlight those which are perfectly mastered and those which are not, with the aim of improving the undergraduate training. The final-year students were selected to evaluate the level of self-perceived competency, and the survey was administered on the last month of their 6-year program. At this stage, students had completed their clinical training and were preparing for the exit examination which consisted of OSCE, treatment planning, and case presentation. These students when they answered the questionnaire they have never worked in a private practice. This timing of the survey was chosen to capture accurate self-assessment. The competencies were estimated by student’s self-assessment using a Likert scale; this method, although subjective, was shown to be a very good estimate of clinical skills [4–6].

The final-year students rated themselves as being most competent in “undertaking supragingival-subgingival scaling-Item 22” “identifying the location, extent, and degree of activity of dental caries-Item 24,” “restoring diseased and damaged teeth-Item 25,” and “taking and interpreting dental radiographs-Item 12.”

TABLE 3: Skills for which the respondents felt not competent and their association with demographic variables.

	Competency item	Competency assessment				Sex	Repeated grades	
		Very competent <i>N</i> (%)	Competent <i>N</i> (%)	Not competent <i>N</i> (%)	Not at all competent <i>N</i> (%)	Do not know <i>N</i> (%)	<i>P</i> value	<i>P</i> value
1	C43: recognizing indications and contraindications, principles, and techniques of surgical placement of osseointegrated implant fixtures	12 (8.3)	59 (40.7)	46 (31.7)	20 (13.8)	8 (5.5)	0.576	0.194
2	C5: evaluating published clinical and basic science research and integrate this information to improve the oral health of the patient	9 (6.2)	61 (42.1)	50 (34.5)	18 (12.4)	7 (4.8)	0.159	0.115
3	C8: using contemporary information technology for documentation, continuing education, communication, and management of information and applications related to health care	14 (9.7)	46 (31.7)	55 (37.9)	26 (17.9)	4 (2.8)	0.404	0.251
4	C28: recognizing indications for surgical root canal therapy	11 (7.6)	60 (41.4)	56 (38.6)	17 (7.6)	7 (4.5)	0.165	0.483
5	C2: managing of a dental practice by planning, organizing, and leading the practice team	13 (9)	46 (31.7)	40 (27.6)	34 (23.4)	12 (8.3)	0.330	0.218
6	C31: managing dental trauma	8 (5.5)	46 (31.7)	61 (42.1)	17 (11.7)	12 (8.3)	0.728	0.221
7	C48: recognizing the pathological features and dental relevance of common disorders of the major organ systems and have knowledge of the oral manifestations of systemic diseases	5 (3.4)	46 (31.7)	71 (49)	16 (11)	7 (4.8)	0.612	0.235
8	C51: diagnosing medical emergencies and knowing how to deal with them	7 (4.8)	44 (30.3)	69 (47.6)	19 (13.1)	6 (4.1)	0.426	0.501
9	C34: recognizing maxillofacial problems	10 (6.9)	40 (27.6)	58 (40)	29 (20)	7 (4.8)	0.715	0.509
10	C15: recognizing signs of patient abuse and neglect and knowing how to report as required to the appropriate legal authorities	10 (6.9)	40 (27.6)	61 (42.1)	22 (15.2)	11 (7.6)	0.926	0.567
11	C18: diagnosing common oral mucosal diseases and disorders	9 (6.2)	40 (27.6)	65 (44.8)	27 (18.6)	3 (2.1)	0.630	0.291
12	C32: managing common intraoperative and postoperative surgical complications	6 (4.1)	43 (29.6)	62 (42.8)	28 (19.3)	7 (4.3)	0.608	0.235
13	C19: managing common oral mucosal diseases (treat/refer)	11 (7.6)	30 (20.7)	67 (42.8)	32 (22.1)	4 (2.8)	0.305	0.376
14	C30: performing surgical extraction of an uncomplicated unerupted tooth and the uncomplicated removal of fractured or retained roots	13 (9)	24 (16.6)	52 (35.9)	45 (31)	10 (6.9)	0.609	0.207
15	C46: employing appropriate techniques to manage orofacial pain, including TMJ/occlusion disorders, discomfort, and psychological distress	4 (2.8)	19 (13.1)	67 (46.2)	46 (31.7)	9 (6.2)	0.661	0.558
16	C44: performing dental implant prosthesis	5 (3.5)	9 (6.3)	46 (31.7)	69 (47.6)	16 (11)	0.592	0.594
17	C23: performing in usual periodontal surgical procedures	5 (3.5)	9 (6.3)	35 (24.3)	75 (52.1)	20 (13.9)	0.079	0.440
18	C20: performing soft tissue diagnostic procedures (biopsy or excision. . .)	1 (0.7)	10 (6.9)	48 (33.1)	65 (44.8)	20 (13.8)	0.305	0.204

These skills obtained the best scores and were well taught during the programme, because they are clinical procedures that students have more exposure to in their training.

These skills were also scored well in most other studies [3, 7, 8], and this would tend to demonstrate that certain skills are easier to master than others. This was consistent

TABLE 4: Skills which respondents want to be improved during the curriculum.

Order	Competency item	Quotation core
(1)	Performing surgical extraction (C30)	62
(2)	Performing in usual periodontal surgical procedures (C23)	59
(3)	Performing dental implant prosthesis (C44)	43
(4)	Performing soft tissue diagnostic procedures (biopsy or excision. . .) (C20)	23
(5)	Diagnosing temporomandibular disorders and disorders of masticatory muscle function (C46)	19

also with the findings of Karaharju-Suvanto et al. [9], where a large majority of students found that their dental course provided them with appropriate and even excessive education in cariology and periodontology. The heavy focus on these topics across dental schools may be attributed to the fact that dental caries and periodontal disease are within the most common health problems globally [10].

However, other skills were evaluated as more difficult to master at the end of the curriculum such as “performing soft tissue diagnostic procedures (biopsy or excision. . .)-Item 20” which obtained the lowest percentage and was one of the five skills which requires in-depth mastery according to the students. These results, similar to other findings [11–14], were dissatisfying considering the requirement to be taught the clinical presentation, diagnosis, and management of the common diseases of the oral mucosa in the dental curriculum for undergraduate students. “Performing usual periodontal surgical procedures-Item 23,” “managing and treating common intra-operative and post-operative surgical complications-Item 32,” “performing dental implant prosthesis-Item 44,” and “identifying the indications and contraindications of surgical placement of osseointegrated implant fixtures-Item 43” are skills often recognized as difficult to master at the end of the curriculum, and these results were similar to other findings from France and UK [11, 15–17]. This could be explained by the fact that soft tissue diagnostic procedures are handled essentially by residents and specialists and it necessarily takes a few years of professional experience to feel competent in this field. Increased student observation and using virtual stimulated patients may be specially beneficial towards improving self-assessed competence in this field [18].

Similar to the findings from France and UK [3, 19], results of the present study showed that the respondents felt more competent in performing simple tooth extraction procedures, while they felt less competent in performing complex procedures. In order to improve their students’ surgical skills, some dental schools used simulators that have realistic manikins along with dental models incorporated in a dental simulated operator. The simulated models allow the instructors to explain and improve on students’ hand-eye coordination and dexterity. The new technologies are being developed to include “haptic” (sense of touch) and “virtual lab environments” into the simulation exercises because these technologies are able to increase motor skills and student efficiency [19].

Final-year students felt not confident in “managing orofacial pain, including TMJ/occlusion disorders, discomfort, and psychological distress-Item 46,” “recognizing maxillofacial problems-Item 34,” and “managing common oral

mucosal diseases and disorders-Item 18-Item 19.” These skills are always considered as difficult and poorly mastered at the end of dental studies when students or recent graduates are interviewed [5, 20, 21], and the mastery difficulties of these skills could be explained by the fact that students are not exposed enough to patients with oral mucosal diseases and TMJ/occlusion disorders during their training that it necessarily takes several years of professional experience to feel competent in this field. Despite the fact that these skills are considered difficult to master, even in several dental schools, it is very important to try to improve them in our school through practical workshops and case studies.

“Diagnosing medical emergencies and knowing how to deal with them-Item 51” was a skill for which mastery is never considered as complete in dental curricula [9, 21].

The medical urgencies and emergencies can occur at any time, any place, and with any person during or after any dental procedure, as health professionals, dentists must be aware about these emergencies and must consequently deal with the risks and responsibilities associated with their occupation [21–23].

For this reason, it is fundamental to include BLS training in the dental curricula [21, 24]. Effective interactive workshops associated with different instructional techniques and postgraduate training in emergency care should be made available to Tunisian dentists and dental students and could help improve the management of the different medical emergencies that can occur during everyday practice [24].

Similar to Clermont-Ferrand Dental School graduates [3], Tunisian final-year students seem to perceive different areas of oral pathologies as being difficult “Item 48,” such skills that are difficult to master at the end of several dental school curricula should be improved because oral conditions may adversely affect the general health and certain medical conditions may have a negative impact on the oral health; therefore, it is recommended to adopt new educational techniques and greater interaction between medical and dental staff to achieve higher educational skills [11, 25].

Unfortunately, our school still adopts old learning methods such as lectures and face-to-face learning despite the fact that there are today a range of new learning methods much more modern. Indeed, mobile learning and social networks (SN) have intruded several schools, providing new technological innovations in the field of education [26, 27]. Mobile learning may offer a continuous access to the learning process, with the possibility of distance education without the restrictions of place and time. It offers also an amelioration of the domain knowledge model by adapting it to the students’ needs and to the pace that they prefer to

receive learning. Moreover, it creates personalized tutoring advice in order to support students in the educational process and can assist in the procedure of assessments.

According to Troussas et al. [26], the evaluation of the mobile tutoring system presents promising results regarding the incorporation of this new technology in digital education with the aim of creating a student-centric learning experience, while the use of social networks in education has the potential to extend e-learning and to introduce new forms of tutoring, communication, and collaboration between students and instructors [27].

About 75% of Tunisian final-year students felt not competent in managing dental trauma because the majority of the dental trauma cases are handled by the residents and specialists and require immediate management. As a result of this lack of exposure, students felt undertrained and ill-prepared to manage dental trauma [28–30]. Lack of self-assessed competency in dental trauma management is problematic as mismanagement can lead to irreversible complications with long-term effects to the patient and family. Results of the present study showed that there is a need for more courses in dental traumatology to increase the knowledge level and to improve the quality of education in dental trauma. A new method based on problem-solving learning (problem-based learning (PBL)) must be adapted in our school in order to improve this skill; indeed, several studies have reported that PBL can not only improve the integration of basic and clinical skills such as management of dental trauma but also can improve communication skills, teamwork, and self-directed learning [31]. Continuing education through courses, seminars, and workshops to students and dentists can be also considered as important methods for improving this knowledge [30].

Similar to dental graduates in Hong Kong [32], UK [33], and France [3], Tunisian final-year students felt inadequately prepared in “managing of a dental practice-Item 2.” In order to improve the student’s preparedness for the different management aspects of dental practice, dental schools should develop a dental practice management courses and arrange regular sessions with practitioners who have adequate dental practice experiences with students and newly graduate dentists [33]. Dental schools should also include leadership courses in their curricula so that all graduating dentists should benefit from it regardless of the type of career path. By teaching communication skills, staff management, patient management, teamwork, and financial resource management through a leadership training, dental schools can improve such skills [34–36].

To resolve the lack of knowledge related to this field, a French dental school implanted a mandatory training period in a private practice in the curricula during the 2007-2008 academic year. At the Clermont-Ferrand Dental School, final-year students practice full time under the supervision of a dental practitioner for two months. These training periods in a private practice allow dental students to feel more competent concerning professional skills which are generally difficult to master in a hospital environment; such mandatory training should be introduced in the faculty curricula [37].

“Evaluating published clinical and basic science research and integrate this information’s to improve the oral health of the patient-Item 5” was a skill which always recognized as difficult to master at the end of the curriculum despite the fact that several studies have shown that the students experience in research helps them to develop and improve their skills [38]. For this reason, dental schools’ curricula should create opportunities that encourage undergraduate students to experience scientific research because this could prepare them to become confident learners and improve their critical and analytical skills [38–40].

Amongst the 18 skills which the respondents felt not competent, five were found that require in-depth mastery according to the respondents. These five skills are those which obtained the lowest percentages.

One of the important findings of the present study was that insufficient clinical experience has led to decreased clinical competency in undergraduates despite the high success rate (80–90%) in the Faculty of Monastir. However, increasing clinical experience is difficult with restraints such as increased student numbers and limited material resources of our school.

In this survey, some significant differences between females and males were found as in some other surveys [20, 41].

Some researches indicated that women felt more competent in some fields representing problem-solving and critical thinking and other studies reported that female students find issues of academic and clinical work more stressful than do male students. Previous studies have shown also that female dental students scored higher on social skills, caring factor, sensitiveness, and expression of emotions and male dental students reported higher levels of ability in skills related to decision-making and activities aimed at diagnosis and interventions in diseases [42].

Significant differences were also found in other studies between older and younger dental students [43]; in the present study, some significant differences were found between repeater and no-repeater students and this can be explained by the fact that older students are more exposed to certain clinical cases during their repeated years; only the repeated 4th and 5th grades were counted because most assessed sills were clinical and in our school students can start their clinical practice only from the 4th grade.

Students’ suggestions in relation to curriculum in the Faculty of Dental Medicine of Monastir showed that the final-year students preferred practice time in the faculty clinic under specialist supervision. Additionally, a preference for an added year of general practice following dental graduation indicates a desire for greater clinical exposure and experience.

Various methods for assessing the effectiveness of curricula have been used, such as competency examinations, board examinations, clinical output, instructor evaluations, and student, alumni, and patient satisfaction surveys. In this study, a survey included final-year dental students was used as it was felt it could provide information on the strengths and weaknesses of the curriculum. Surveys are only one method of evaluating the curriculum, but

ideally, other methods of curriculum assessment such as clinical output, board examinations, and instructor, patient, and employer surveys should be used to obtain a comprehensive view of the effectiveness of the Tunisian dental curriculum [22].

4.1. Recommendations. In order to improve undergraduate training given by the Faculty of Dental Medicine of Monastir, the traditional lecture-based and teacher-led curriculum that demonstrated a limited integration between the different disciplines should be replaced by a student-centered fully integrated problem-based learning (PBL) curriculum. A new curriculum that allows both horizontal and vertical integration across the various disciplines and promote interactive and collaborative learning should be adopted.

To improve students' clinical experience, the Faculty of Dental Medicine of Monastir should introduce clinical practice very early into the curricula within the first two years of study.

And to improve professional skills which are generally difficult to master in a hospital environment, a mandatory training period in a private practice should be introduced in the Faculty of Dental Medicine of Monastir curricula.

5. Conclusion

The final-year dental students demonstrated reasonable self-perceived competency level in some fields of general dentistry, but some skills seem to require more training in order to be mastered perfectly. For this reason, a new teaching methodology and an update in the dental curricula towards student-centered learning must be adopted in the Faculty of Dental Medicine of Monastir in order to ensure proper and a better acquisition of the eighteen clinical competences which obtained the lowest percentages according to the students.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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