Graduating dentists' perceptions about their professional competence in Finland and Lithuania

Running title: Competence of graduates in Finland and Lithuania

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Key words: competence, dental students, dental education, self-assessment

This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the Version of Record. Please cite this article as doi: 10.1111/EJE.12488

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Article type : Original Article

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Abstract

Aims: Efforts to harmonise dental education in Europe have been put into action by the Association for Dental Education in Europe (ADEE). The aim of the study was to explore graduating dentists' perceptions about their professional readiness for clinical work in Finland and in Lithuania.

Materials and methods: The survey targeted 5th year dental students at the University of Oulu and the University of Turku in Finland, and at the Lithuanian University of Health Sciences, Kaunas, Lithuania (Lithuanian and international students) in 2016–2017. The competences were evaluated in the questionnaire in 21 dental procedures based on ADEE competences by options: "I'd manage well", "I'd need more training" or "It would not quite succeed". The option "I'd manage well" was chosen in the analyses.

Results: Students felt that they were most competent in producing and maintaining accurate patient records (91.9%), implementing sterilisation and hygiene in dental practice (91.3%) and working with other members of dental team and health profession (90.0%). The largest differences between Finnish and Lithuanian students were in designing and adjusting occlusal splints (87.0% vs. 14.3%) and in undertaking subgingival scaling (95.7% vs. 57.1%). The biggest differences between Lithuanian and international students were in identifying (and treating) abnormal and anxiety-related patient (73.1% vs. 25.5%) and implementing tobacco cessation (65.3% vs. 31.9%).

Conclusions: The graduating dental students in Finland and in Lithuania manage well in most of the clinical procedures based on the ADEE competences. The students were most confident when dealing with tasks that are common in dental practice.

Introduction

In order to harmonise dental education in Europe, the Association for Dental Education in Europe (ADEE) has developed the profile and competences for dentists and published the guideline "Profile and Competencies for the Graduating European Dentist" in 2010 (1,2). The European dental schools are expected to adhere to the profile and the major competences, but the details of the proposed supporting competences may vary between schools. The ultimate aim of the taskforce is to encourage dental educators to draw upon the content of the document to assist them in improving the quality of the dental curriculum.

Dental curricula, theoretical studies and teaching clinical skills are determined by the universities and medical faculties. Most Western European countries have implemented the ADEE guidelines, followed by the former Eastern European countries. The universities responsible for the undergraduate dental education in Finland (Universities of Eastern Finland, Helsinki, Oulu and Turku) and in Lithuania (University of Kaunas and Vilnius) have implemented the ADEE guidelines, with some minor differences due to local tradition, scientific priorities of the staff and differences in patient material.

Both in Finland and in Lithuania, the five-year undergraduate dental curricula follow Directive 2005/36/EC of the European Parliament and Council (3). In Lithuania, the dental curriculum is a five-year curriculum of 300 ECTS. In the 1990s, the Lithuanian University of Health Sciences (LSMU) started to give dental education in English for international students using a curriculum that was parallel and identical with that for Lithuanian students. Dental specialty subjects total 175 ECTS, and the students start them in the second year of their studies (such as preclinical courses in prosthodontics, dental and oral pathology), continuing in the third year with clinical courses in prevention of oral diseases, cariology, endodontics, prosthodontics, dental radiology, orthodontics, periodontology, paediatric dentistry,

maxillofacial and oral surgery, oral mucosa diseases, rehabilitation of maxillofacial function). Vocational training is included in this five-year curriculum.

Within the undergraduate dental curriculum in Finland, theoretical studies are arranged by Universities and clinical training by the hospital district of each University hospital. In clinical training, the undergraduate dental students treat patients according to the learning objectives defined by the University. Since undergraduate dental training is focused on primary oral health care, the hospital districts of the university hospitals in Oulu and Turku have organised the clinical training in public health centres. In 2014, the duration of dental education in Finland was extended to 5.5 years with the inclusion of vocational training (4).

The aim of our study was to explore graduating dentists' perceptions about their professional readiness for clinical work in Finland and in Lithuania.

Subjects and methods

This was a cross-sectional survey among graduating dentist in Finland and Lithuania in 2016–2017. The questionnaire survey was conducted at the end of the spring term in 2016 and in 2017. The survey targeted graduating 5th year dental students at the University of Oulu and the University of Turku in Finland, and the Lithuanian University of Health Sciences (LSMU), Kaunas, Lithuania. In Lithuania, dental undergraduates who answered the questionnaire were allocated to two groups: Lithuanian and international students.

The content of the questionnaire was based on ADEE competences (2). Altogether 21 dental procedures or tasks were chosen to cover the clinical procedures that graduating dental students need to know how to do when they start working as dentists, as well as the seven professional domains defined by ADEE (Figure 1). A pilot study was conducted in Finland (5).

In Finland, the pilot study questionnaire (5) was used in this survey. In Lithuania, the same ADEE recommendations were translated from English to Lithuanian by the researcher (JN), and a native English speaker back-translated it in an effort to ensure the accuracy of the Lithuanian version. The participants were informed of the aims of the study and the contact details of the responsible researchers. Participation in the research was voluntary and the

questionnaire was filled anonymously. The ethical principles of the Helsinki declaration were taken into account in the study. There are no identifiers in the data. Participants cannot be identified in the research report. The Bioethics Centre of the Lithuanian University of Health Sciences granted approval of the ethics of the study protocol (reference: BEC-OF-96). The legislation in Finland did not require an ethical committee approval for the anonymous survey.

In Finland, the survey targeted graduating dental students at the University of Oulu in 2016 and in 2017 and graduating dental students at the University of Turku in 2016.

The data were collected in May 2016 and May 2017. In Lithuania, the researcher (JN) asked all (n = 292) graduating dental students (both Lithuanian and international) to complete an anonymous self-administered written questionnaire during a compulsory practical class. After completing the questionnaires, the students immediately returned them to the researcher.

The students were asked to evaluate the competence of how they will succeed in managing procedures or tasks by choosing one of three options: "I'd manage well", "I'd need more training" or "It would not quite succeed". For the Figures, the option "I'd manage well" was chosen in the analyses.

Statistical analyses:

Statistical analyses of the answers were performed by the SPSS computer program version 19. Continuous variants were made by using variance analysis (ANOVA) and t-test. Fisher's exact test was used on the tables.

Results

In Finland, the response rate was 93.5% (University of Oulu, n=86; University of Turku, n=29). In Lithuania, the response rate was 100% (Lithuanian students n=245, international students n=47).

Finnish students had the highest value of self-assessed competence scores in the option "I´d manage well" and the difference compared to Lithuanian and international students was

statistically significant ($p < 0.001$, Table 1). International students had higher values in self-assessed competence in both "I'd need more training" and "It would not succeed" than Finnish and Lithuanian students. The difference was statistically significant ($p < 0.001$, Table 1).

When analysed by gender, there were no differences in self-assessment of managing the procedures (Table 2).

All students felt that they were most competent in producing and maintaining accurate patient records (91.9%), implementing sterilisation and hygiene in dental practice (91.3%) and working with other members of the dental team and health profession (90.0%).

Finnish students felt that they were most competent in producing and maintaining accurate patient records (99.1%), administering block anaesthesia (*n. mandibularis*) (97.4%) and implementing sterilisation & hygiene in dental practice (97.4%) (Figure 1). Likewise, Lithuanian students felt that they were most competent in producing and maintaining accurate patient records (93.5%), implementing sterilisation and hygiene in dental practice (93.5%) and performing endodontic treatment on uncomplicated multi-rooted tooth (91.4%).

The biggest differences in perception about professional competence between Finnish and Lithuanian students were seen in designing and adjusting occlusal splints for patient (87.0% vs. 14.3%), undertaking subgingival scaling (95.7% vs. 57.1%) and performing biopsy for histological diagnosis (54.4% vs. 16.7%) ($p<0.05$, Figure 1). The smallest differences in self-assessment of clinical competence between Finnish and Lithuanian students were in performing surgical removal of partially erupted wisdom tooth, treating a fearful child patient and working with other members of the dental team and health profession (Figure 1).

International students felt that they were most competent in working with other members of the dental team and health profession (85.1%), producing and maintaining accurate patient records (83.0%) and implementing sterilisation & hygiene in dental practice (83.0%) (Figure 2).

The biggest differences in perception about professional competence between Lithuanian and international students were in identifying (and treating) abnormal and anxiety-related patient

(73.1% vs. 25.5%)), implementing tobacco cessation for patients (65.3% vs. 31.9%) and providing referral for patient with oral cancer (36.3% vs. 6.4%). The smallest differences in self-assessed competence between Lithuanian and international students were in managing (treating) dental trauma, designing and adjusting occlusal splints for patient and diagnosing oro-facial pain (Figure 2).

Discussion

The undergraduate dental students in Finland and in Lithuania perceived themselves as competent in collaborating with the dental team and other health care professionals, as well as managing with accurate patient records and implementing sterilisation and hygiene in dental practice. This is a positive message concerning non-measurable clinical competencies, but these procedures also deal with tasks that are common in dental practice. It is obvious that competence may be well achieved in managing situations that are frequently met in practice by dentists as well as by dental students. In addition, the results are in accordance with the major competences (communication skills and clinical information gathering) in the ADEE guidelines (2). However, achievement of major competence according to the ADEE recommendation requires the acquisition and demonstration of the supporting competences related to that particular service or task (2). Competence of performing certain procedures also depends on the learning objectives as well as the methods of teaching, learning and assessment in the curriculum (6).

The graduating Finnish and Lithuanian dental students felt that they would manage well in most of the procedures included in the study. Our findings are in accordance with studies from the United Kingdom where final-year undergraduate dental students felt that they were adequately prepared to carry out simple clinical procedures and communication skills (7), but were less confident in complex procedures that were least practised, such as surgical or prosthetic tasks (8). In the study of recently graduated Young Dentists in Finland, it was reported that the young dentists felt that they could easily perform oral radiology/radiographic diagnostics as well as endodontical and cariological procedures (4). In contrast to our findings, some gender differences have previously been reported (8).

Our findings showed a major difference in the perception of professional competence ”Performing biopsy for histological diagnosis” and ”Designing and inserting occlusal splints

for patients" between the LSMU (Lithuanian and international) and Finnish students. On the other hand, a difference was also found between Lithuanian and international students in the perception of competence concerning the procedure "Designing and inserting occlusal splints for patients". Findings that LSMU students are less aware of performing procedures by themselves might be explained by the fact that these procedures are not daily routine procedures (such as administering anaesthesia or cavity preparation) and students feel the lack of practical skills during clinical courses. The differences may also reflect local traditions in clinical practice and dental curriculums, or differences in patient material.

Summative assessment has shown to relate to clinical performance in health profession education (9). In our study, competences to perform procedures were self-assessed by the graduating students, which may be considered a weakness of the study. However, self-assessment is an important part of learning (10). Self-assessment has been defined as an active process of developing an awareness of personal learning objectives (11). In this way, dental students can realise their strengths and weaknesses, as well as define goals for themselves for their future profession. Through reflection with the teachers, students should get a realistic picture of their competence to perform clinical procedures, not to attempt tasks that are too challenging (ethics, proper clinical skills) or, on the other hand, should feel competent enough to perform procedures. In dental education, one goal should be to teach the students realistic self-assessment in everyday practice. In recent literature, digital concepts (12-15) and using video recordings in self-assessment (16,17) have been evaluated. Digital self-assessment has shown to be equivalent to the conventional form of supervision (13) and it may, in particular, help lower-performing students to improve their assessment ability (12,14). In general, low-performing students tend to overestimate their self-assessments compared to high-performing students, who have more realistic or even underestimated self-assessments (10). Besides self-assessment, experiences of peer assessment and peer feedback have been positive (18,19). Peer- and self-assessment have shown to help students to develop skills in decision-making, communication and professionalism (18,19).

Originally, the ADEE outlined seven different domains in the "Profile and Competences" document (2). The ADEE recommendations have been actively implemented in Finland, for example, by translating them into Finnish and by adjusting the competencies nationally as the basis of clinical assessment in undergraduate dental education. In Lithuania, starting in the 20th century, dental education developed gradually from stomatological education towards the

European model. In 2015, a national working group prepared a recommendation for dental education along the European guidelines, the implementation of which was approved by the Lithuanian Ministry of Education.

Recently, the domains have been reclassified into four, reflecting modern dental educational practice (20). These four domains introduce more clarity and utility for educators whilst respecting regional (socio-economic and cultural) variation. The proposed new domains are professionalism, safe and effective clinical practice, patient-centred care, and dentistry in society (20). The new domains are expected to further refine and harmonise dental undergraduate curricula across Europe; the new domains will also be applied in Finland and in Lithuania in the near future. Although change and improvement of curriculum may be a long process, as found in the survey of the DentEd Thematic Networks (TNP) (21), the findings of this study point out some suggestions to improve the curriculum in undergraduate dental education.

Conclusions:
The graduating dental students in Finland and in Lithuania perceived that they would manage well in most of the clinical procedures based on the ADEE competences. The students were most confident when dealing with tasks that are common in dental practice.

Acknowledgements
We thank the graduating dental students in Finland and in Lithuania for their active participation in the study.

Disclosure statement
The authors have nothing to disclose.

Figure legends
Figure 1. Self-assessment of managing clinical procedures by Finnish and Lithuanian 5th year undergraduate dental students.

Figure 2. Self-assessment of managing clinical procedures by 5th year undergraduate dental students in LSMU, Kaunas, Lithuania (Lithuanian and international dental students).

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Table 1. The means, standard deviations (SD), minimum and maximum values of competence scores among the Finnish and Lithuanian (Lithuanian and international) graduating dental students.

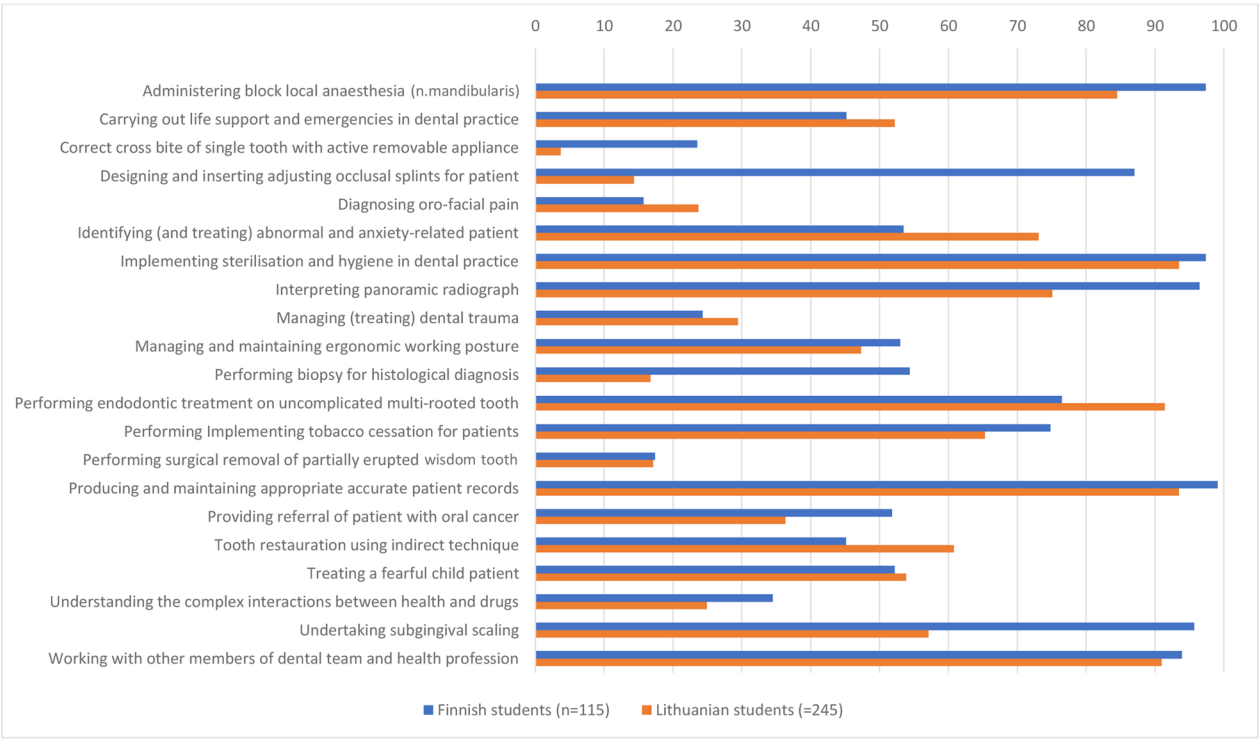
		FINLAND (N=115)	LITHUANIA (N=202)		
			Lithuanian students	International students	P-VALUE
I'D MANAGE WELL	Mean	12.9	11.1	8.8	< 0.001*
	SD	3.2	3.5	3.5	
	Min	6	1	2	
	Max	20	19	20	
I'D NEED MORE TRAINING	Mean	7.4	8.1	9.2	< 0.001*
	SD	2.8	2.9	2.7	
	Min	1	1	1	
	Max	13	17	18	
IT WOULD NOT SUCCEED	Mean	0.6	1.9	3.0	< 0.001*
	SD	1.1	1.6	2.4	
	Min	0	0	0	
	Max	4	8	8	

*Global p-value (ANOVA)

Table 2. The means, standard deviations (SD), minimum, maximum and p-values by gender among the graduating dental students (n=407) in Finland and in Lithuania.

		GENDER			
		Male (n=110)	**Female (n=292)**	**Total (n=407)**	**P-value***
I'D MANAGE WELL	Mean	11.7	11.1	11.3	0.165
	SD	3.7	3.6	3.6	
	Min	2	1		
	Max	20	20		
I'D NEED MORE TRAINING	Mean	7.9	8.1	8	0.525
	SD	3	2.9	2.9	
	Min	1	1		
	Max	18	17		
IT WOULD NOT QUITE SUCCEED	Mean	1.4	1.8	1.7	0.087
	SD	1.7	1.7	1.7	
	Min	0	0		
	Max	8	8		

*T-test



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