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A Comparison of the Turkish and American Predoctoral Pediatric Education

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ABSTRACT

This study aimed to compare the Turkish (Karadeniz Technical University) and American (Boston University) predoctoral pediatric dental education. Given related curricula and first-hand observations at dental schools at Karadeniz Technical University and Boston University, documentary analysis was employed to emerge their similarities and differences. The authors, who matched the courses in both universities, found the following similarities between them: (a) class-hours; (b) subject matter and laboratory-based courses prior to pediatric clinic; (c) measurement and assessment methods; and (d) content knowledge. Moreover, their main differences appeared at the pediatric clinical treatment sessions, rotation (special needs and community clinics in Boston University; community clinics in Karadeniz Technical University), and subject-matter courses (e.g., *Child Abuse, Review Cases and Integrated Problem-Solving Exercise)*. This study sheds more light on collaborative works between dental schools and faculty of education. For example; the questions 'How are alternative strategies integrated into dental education?' and 'How are the subjects taught effectively?' should be inquired. The authors suggest to enhance international collaborations (e.g., student/faculty exchange programmes, distance education, monthly online meeting, and teleconferences) for achieving better dental education.

Keywords: curriculum, dental education, national context, pediatric dentistry, predoctoral pediatric education

INTRODUCTION

Advances in education, knowledge, and technology influence disease patterns and patient expectations. Hence, these rapid changes force medical and dental education to keep up with new trends/demands (Parsell, & Bligh, 1995). An evolution from the biology of oral diseases to the environmental and psychosocial determinants of oral health and disease has recently led to a substantial revision of curricular objectives in many dental schools (Khatami, MacEntee, & Loftus, 2008).

Nowadays, predoctoral dental education intends to train competent clinicians implementing effective patient care (i.e., restoration of calcified tooth structure). In a globalized world, dental schools follow similar research paradigms and trends in their curricula. Of course, these curricula indicate some differences in context, and culture (Bell, Barenie, & Myers, 1986). For example, home language legitimately affects dental education (i.e., Turkish and American English). Turkey and USA possess varied ethnical and cultural structures. The American dental education is very innovative whilst the Turkish one is generally adaptive to these innovations. Moreover, since the Turkish dental education is younger than the American one, clinical experiences/experiments are seen as an important topic. That is, the Turkish dental education views dental education as an inferior issue. Phrased differently, the Turkish dental education is very novice at discussing such topics as curriculum reform, educational research methods, innovative educational and assessment methodologies, and dental education around the world. Indeed, the American dental education has argued these issues since early 20th century. Given the foregoing

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Contribution of this paper to the literature

- Even though some of the related studies compared special patient care programmes/needs for developed and developing countries, none of them have explicitly concentrated on a comparison of predoctoral pediatric dentistry within national contexts (i.e., USA and Turkey). Therefore, this study is unique to fill in an important gap in the literature.
- Given features of the Turkish and American dental education (e.g., innovative and adaptive), the current study will illuminate pros and cons of their predoctoral pediatric dental education programmes.
- The current study helps dental educators to re-consider on future educational issues in dental education systems/curricula. In other words, the present study may, at hand, portray their SWOT analyses (especially, Karadeniz Technical University and Boston University).

issues, this current paper selected the Turkish and American predoctoral pediatric dental education programmes to compare them with each other. Therein, such a comparison may be helpful to design future educational topics in dental education systems/curricula (Ahmad, Razak, & Borromeo, 2014). Further, the current study may stimulate an interactive dialogue to empower predoctoral pediatric dental curriculum. Furthermore, this study at least indicates SWOT (Strengths-Weaknesses-Opportunities-Threats) analyses of predoctoral pediatric dental education in Karadeniz Technical University and Boston University.

American Dental Education System

Most dental schools in Northern America require applicants to have a bachelor's degree. Admission Department in each dental school review and assess applications via several criteria (e.g., academic background, recommendation letter and American Dental Admission Test (DAT) Scores). Then, applicants are called for personal interviews in regard to a list of priority order (ADEA, 2007; Wu, Zhang, Jiang, & Guo, 2010).

The American dental education typically consists of a four-year predoctoral education. Its first two years generally include basic science and preclinical instruction, whilst its last two years embrace clinical science instruction and patient care. After completing the predoctoral education, graduates may apply for a State Dental Board licensure (e.g., North East Regional Board of Dental Examiners Read—NERB--, and Western Regional Exam Board--WREB) (Ng, Glassman, & Crall, 2008). American dentists are also required to obtain *Continuing Education* credits every 2 years if they would like to renew their dental licenses. American dentists may get an additional postdoctoral education amongst nine recognized dental specialties, which may specify their practices/experiences. Specialty-trained dentists may also seek a voluntary board certification.

The American predoctoral dental education is provided by 66 universities (39 state universities; 27 private universities) (Douglass & Fein, 1995). The Commission on Dental Accreditation (CODA) accredits and standardizes all dental schools in these universities.

Turkish Dental Education System

After a high-stakes nation-wide examination, students submit a university list (maximally 30) to the Assessment, Selection and Placement Center (Ölçme, Seçme ve Yerleştirme Merkezi—ÖSYM) in regard to their scores (Çalik, 2014; Çalık, Ültay, Kolomuç, & Aytar, 2015). Then, the Assessment, Selection and Placement Center centrally places them into the universities in regard to their scores. That is, the high-stakes examination does not directly measure nor evaluate their knowledge of dentistry.

The Turkish dental education usually runs a five-year predoctoral education. Its first two years usually focus on 'biomedical sciences and preclinical laboratory skills' courses. The third year of the study contains 'clinical dental sciences' courses and dental observations in a dental hospital. The fourth and fifth years of the study require them to exclusively conduct patient care as interns. Their clinical experiences involve cooperation between dentistry students and mentors. Overall, the fifth-year of the Turkish dental education generally embraces direct clinic patient care (about 80%) and didactic instruction study (nearly 20%).

The Turkish dental education requires dentistry students to acquire adequate dental experiences in treating children properly. Undeniably, if students lack clinical competency at dental treatment for children, they may be reluctant to treat pediatric dentistry patients in their practices. Thus, their inabilities to treat pediatric dentistry patients increase specialist pediatric dentist's workloads (Bell, Barenie, & Myers, 1986; McKnightHanes, Myers, Russell, Barenie, Adair, Sams, & Krakowiak, 1996). This illuminates the significance of predoctoral dental education given the limited number of specialists.

There are currently 47 Turkish universities (37 states and 10 privates) including dental schools. All state universities are free of charge; but, private universities require students to meet their own tuitions. Currently, an

increase in the popularity of the dentistry has affected the Higher Education Council's strategic plan on new dental schools. Turkey, as an EU candidate, has been conforming its educational reforms in regard to the Bologna Declaration intending to help students and staff obtain more reliable information about dental qualifications (Komabayashi, Ahn, Kim, & Oh, 2012; Şermet, Akgün, & Atamer-Şimşek, 2011). As a developing country, Turkey has also been revising its dental education based on the Bologna Declaration and developed countries' experiences (i.e., USA). For example, the Higher Education Council has just released on core dental education programme for a standardized dental education across the dental schools. This means that the developed countries dental programmes are a pivotal role in shaping the developing countries' ones.

Literature Review

Studies in dental education have focused on: (a) comparing special patient care programmes/needs (i.e., Saudi and U.S.; Malaysian and Australian) (Ahmad et al., 2014; Alkahtani, Stark, Loo, Wright, & Morgan, 2014; Schwenk, Stoeckel, & Rieken, 2017), (b) needs of community diversity (i.e., multicultural framework, minority/low-income) (Crall, Hewlett, & Friedman, 2009), (c) community-based dental education (Mascarenhas, 2011; Thikkurissy, Rowland, Bean, Kumar, Levings, & Casamassimo, 2008), (d) alternative educational strategies to enhance dentistry students' skills/abilities/competencies (Crall et al., 2009; Ng et al., 2008), (e) curriculum assessment and/or comparisons (Khatami et al., 2008; Komabayashi et al., 2012; Thikkurissy et al., 2008; Wu et al., 2010), and (f) subject-specific topics (i.e. Behavior Management Teaching, Atraumatic Restorative Treatment, experiences of clinical procedures, factors influencing dental students' specialty choice) in pediatric dentistry programme (Adair, Schafer, Rockman, & Waller, 2004; Kateeb et al., 2013; Klein, Storey, & Hanson, 2014; Seale, & Casamassimo, 2003; Shin et al., 2015). Even though some of the foregoing studies compared special patient care programmes/needs for developed and developing countries, none of them have explicitly concentrated on a comparison of predoctoral pediatric dentistry within national contexts (i.e., USA and Turkey). Therefore, this study is unique to fill in an important gap in the literature. Given features of the Turkish and American dental education (e.g., innovative and adaptive), the current study will illuminate pros and cons of the Turkish and American predoctoral pediatric dental education. Further, the current study may be seen as a first step to re-consider on future educational issues in dental education systems/curricula. On the other hand, the present study may, at hand, monitor their SWOT analyses (especially, Karadeniz Technical University and Boston University).

The Aim of the Study

This study aimed to compare the Turkish and American predoctoral pediatric dental education with each other (especially, Karadeniz Technical University and Boston University).

MATERIALS AND METHODS

The authors contacted the respective chairs of the departments of pediatric dentistry and used their personal and professional networks to obtain relevant curricula. A. Kuşgöz informally observed all educational procedures at Boston University Henry Goldman School of Dental Medicine as well as his active participation at Karadeniz Technical University Faculty of Dentistry. Then, he weekly negotiated co-authors (e.g., the chair of the department of pediatric dentistry and science educator) to decide further research steps.

Given related curricula and first-hand observations at both dental schools, documentary analysis was employed to emerge their similarities and differences (Çalık & Sözbilir, 2014). To make document analysis reliable and applicable, the authors separately matched the pediatric dentistry courses at Karadeniz Technical University with those at Boston University. Later, the authors and two independent researchers (one each from Boston University and Karadeniz Technical University) discussed matching and mismatching issues in these analyses. Such a peer review indicated a high agreement in the analyses. Any disagreement was solved through negotiation.

Because of variations in predoctoral pediatric education programmes suggested by the universities and limited access to their course contents and/or syllabus through their websites, the authors selected convenient sampling method to easily get all related documents. Hence, the authors attempted to at least yield a comparative view on the Turkish and American predoctoral pediatric dental education by handling only two specific cases from well-known dental schools (i.e., Karadeniz Technical University from Turkey and Boston University from the USA). Taking the number of dental schools and their diversities into consideration, this may be seen as a limitation of the current study.

RESULTS

An overview of the predoctoral pediatric dentistry education at Karadeniz Technical University and Boston University is presented in **Table 1**. Four themes for types of the pediatric dentistry courses appear: *subject matter of*

Table 1. An outline of predoctoral pediatric dental education in Boston University and Karadeniz Technical University

Learning method time	University	Academic year	Time (class-hours)	Assessment method	Sample Assessment Task/Question
Laboratory-based course	Boston University	2	12	Complementary Assessment (i.e. practical competency exam)	Please prepare and restore a pediatric model using stainless steel crown anterior composite and space maintainer
	Karadeniz Technical University	3	9		
Subject matter course	Boston University	3	48	Traditional assessment (e.g. short-answer question, matching items, multiple choice question)	What are avulsion treatment options in primary tooth?
	Karadeniz Technical University	3	21		
		4	28		
Clinical treatment sessions	Boston University	3,4	80	Complementary Assessment (i.e. practical competency exam, grading clinical work and structured—case studies--clinical examination)	Please diagnose, interpret and treat the case study of the patient
	Karadeniz Technical University	3	5	Complementary Assessment (i.e. clinical observation without patient care)	Please monitor clinical process and communication between dentist and patient
		4	80	Complementary Assessment (i.e. practical competency exam, grading clinical work and structured—case studies--clinical examination	Please directly conduct patient care in pediatric clinic
		5	80		
Rotation	Boston University (Community Clinics)	1	11	Complementary Assessment (i.e. field study)	Please write down how service learning influences your views of dental care.
	(Special Needs)	4	3	Complementary Assessment (i.e. clinical observation without patient care)	Please observe how to carry out patient care for special needs at Franciscan Hospital for Children
	Karadeniz Technical University (Community Clinics)	5	12	Complementary Assessment (i.e. field study)	Please address how to keep school children informed about oral mouth care.
Total	Boston University	1, 2, 3,4	154		
	Karadeniz Technical University	3,4,5	235		

knowledge (theoretical knowledge) that contains a lecturer-centered instruction or didactic instruction; *practical knowledge (laboratory-based course)* that involves hands-on experiments at the laboratory bench or the clinical simulation laboratory; *clinical treatment (practice)* that includes observation or direct patient care supervised by clinical instructors; and *rotation* that includes observation and community service.

Predoctoral pediatric dental education programme lasts at 154 class-hours at Boston University and 235 class-hours at Karadeniz Technical University. However, mean of class-hours in the entire academic years is 38.5 and 78.3 respectively. Predoctoral pediatric dental education programmes in both universities equally teach the laboratory and subject matter courses in practical and didactic formats. However, predoctoral pediatric dental education includes the clinical treatment sessions in Years 3-5 at Karadeniz Technical University and Years 3-4 at Boston University. Mean of class-hours in the clinical treatment sessions is 40 and 55 respectively. A total of the clinical treatment session at Karadeniz Technical University is higher than that of Boston University. As can be seen in **Table 1**, Boston University focuses on rotations in community clinics in Years 1 and 4 (year 1 is focused in service learning activities only, year 4 involves clinical work), and special needs in Year 4. Karadeniz Technical University concentrates on rotation in community clinics in Year 5, in which all students attend regular service-learning activities.

Assessment methods in both universities are also similar to each other. This means that both deploy traditional (e.g., paper-pencil questionnaire) and complementary (e.g. performance task, observation) assessment methods. As observed from **Table 1**, complementary assessment methods are common in predoctoral pediatric education programmes.

The content and class-hours of predoctoral pediatric subject matter courses are summarized in **Table 2**. The 'child abuse', 'review cases' and 'integrated problem solving' lectures at Boston University and 'operative dentistry'

Table 2. The content of each pediatric subject matter course in Boston University and Karadeniz Technical University in regard to year and time

Subject	Boston University		Karadeniz Technical University	
	Year	Time (class-hours)	Year	Time (class-hours)
Introduction to Pediatric Dentistry	3	2	3	3
Prevention: Fluoride, Oral Hygiene & Sealants.	3	2	3	2
Risk Assessment	3	2	3	1
Radiology for Pediatric Patients	3	2	4	2
Growth and Development	3	2	3	1
Oral Surgery for Pediatric Patients	3	2	4	3
Pharmacology & Therapeutics	3	2	4	2
Child Abuse	3	2	-	-
Infant Oral Health & ECC	3	2	3	2
Operative Dentistry	3	2	3	3
Pulp Therapy	3	2	3,4	5
Problems of Eruption	3	2	3	3
Space Maintenance	3	2	3,4	2
Dentistry for Developmentally Disabled	3	2	4	2
Behavior Management and Sedation	3	2	3	2
Dental Trauma	3	2	4	2
Access to Care	3	2	4	1
Dietary Counseling for Pediatric Patients	3	2	3,4	2
Oral Pathology for Pediatric Patients	3	2	4	4
Managing the Developing Dentition	3	2	3,4	4
Treatment Planning for Pediatric Patient	3	2	4	1
Periodontal Diseases in Children	3	2	4	2
Review Cases	3	2	-	-
Integrated Problem Solving(IPS) Exercise	3	2	-	-
Total		48		49

and 'pulp therapy' at Karadeniz Technical University are apparent as the remarkable differences between the Turkish and American predoctoral pediatric dental education.

DISCUSSION

As seen in **Table 1**, class-hours of laboratory-based and subject matter courses are almost the same for the Turkish and American predoctoral pediatric dental education. This may come from pre-requests and/or requirements of predoctoral pediatric dental education. Hence, the dentistry students are expected to get prepared for pediatric clinic. Phrased differently, prior to providing patience care at the pediatric clinic, they underpin their knowledge of subject matter and laboratory-based courses.

Even though clinical instruction in pediatric dentistry seems broadly similar in many American dental schools and elsewhere (Klein et al., 2014; McKnightHanes et al., 1996; Seale, & Casamassimo, 2003; Wu et al., 2010), the main difference between the Turkish and American predoctoral pediatric dental education is the pediatric clinical treatment sessions (see **Table 1**). This may stem from duration differences of the American (e.g., a four-year dental education) and Turkish dental education (e.g., a five-year dental education). Further, pediatric clinical treatments are covered in Years 3-5 for the Turkish dental students and Years 3-4 for the American ones. The limited pediatric clinical treatment in the USA may come from an inadequate pediatric patient pool threating predoctoral students' patient care competencies (Casamassimo, & Seale, 2015; Seale, & Casamassimo, 2003).

A principal difference for special needs under rotation (see **Table 1**) may result from a lack of infrastructure at Karadeniz Technical University. In fact, Boston University collaboratively deals this issue with Franciscan Hospital for Children. Karadeniz Technical University have such topics as the dental management of children with intellectual or medical disabilities; but they have no opportunity to practically implement patient care for this population. Since they attend poor practical training in special need patients (Holder, Waldman, & Hood, 2009), they generally direct these cases to specialty clinics.

Although their years of the study are different (i.e., Year 1 in Boston University and Year 5 in Karadeniz Technical University), dental students at both universities attend community clinics, as part of their service learning education in public schools. Hence, they have an opportunity to teach oral health to children in a classroom environment. This may stem from the idea 'Preventive dentistry plays a significant role in school-based oral health

education'. In a similar vein, these regular service-learning activities act as a catalyst to stimulate the sustainability of pediatric dental education (Haleem et al., 2016).

Because dental education incorporates both laboratory-based and clinical treatment sessions, the assessment methods in the Turkish and American predoctoral pediatric education are very similar to each another. Indeed, these sessions mainly concentrate on learning process within complementary assessment rather than learning outcome within traditional assessment. Further, diverse complementary assessment methods may result from features of predoctoral pediatric dental education. As a matter of fact, laboratory-based courses involve practical competency exam, whilst clinical treatment sessions incorporate clinical observation/examination (see **Table 1**). Interestingly, the fact that subject matter courses refer to traditional assessment may come from their theoretical frameworks and/or lecturer-based instruction.

As seen in **Table 2**, most subjects in the Turkish (Karadeniz Technical University) and American (Boston University) predoctoral pediatric dental education overlap each other; but, 'Child Abuse', 'Review Cases' and 'Integrated Problem Solving (IPS) Exercise' lectures are only available at Boston University. Boston University places special emphasis on evidence-based treatment approaches. The rationale behind "Review Cases and IPS" may stem from the need to offer integrated evidence-based approaches to treatment covering different topics. The IPS sessions ask dental students to review current literature and discuss treatment plan options that emerge in the reasoning behind certain clinical decisions in Pediatric Dentistry. The courses 'Operative Dentistry' and 'Pulp Therapy' seem more intensive in the Turkish (Karadeniz Technical University) predoctoral pediatric dental education than the American (Boston University) one. This may stem from a higher amount of clinical treatment sessions and/or fifth-year of the Turkish dental education (Karadeniz Technical University). Another possible reason is cross-training of these subjects in other courses offered at the American predoctoral dental education (Boston University). For example, trauma and pulp therapy are also offered in the Endodontic curriculum. Other possible explanations may be due to differences in patient pool, disease epidemiology, trends in childhood and insurance coverage between the two countries. In Turkey, dental treatment coverage is financially met by the Turkish government. In the United States, the pediatric population has reduced untreated caries rates as compared with Turkey.

CONCLUSION AND RECOMMENDATIONS

To sum up, the principal similarities between the Turkish (Karadeniz Technical University) and American (Boston University) predoctoral pediatric dental education are as follows: (a) class-hours; (b) subject matter and laboratory-based courses prior to pediatric clinic, (c) measurement and assessment methods, (d) content knowledge. Their main differences appear at; (a) the number of pediatric clinical treatment sessions; (b) rotation (special needs and community clinics in Boston University; community clinics in Karadeniz Technical University), and (c) some subject-matter courses (e.g., *Child Abuse, Review Cases and Integrated Problem Solving (IPS) Exercise).*

This study sheds more light on collaborative works between dental schools and faculty of education. For example; the questions 'How are alternative strategies integrated into dental education?' and 'How are the subjects taught effectively?' should be inquired. Given pros (e.g., Special needs in Boston University; Clinical treatments in Karadeniz Technical University) and cons (e.g., Child abuse subject in Karadeniz Technical University) of the Turkish and American dental education programmes, international collaborations should be enhanced to achieve better dental education via student/faculty exchange programmes, distance education, monthly online meeting, and teleconferences. Also, the current study is supposed to be extended with an undeveloped country. Given the number and programme diversity of dental schools in the USA and Turkey, the current study only focused on two well-known dental schools (i.e., Boston University and Karadeniz Technical University). Future studies ought to reflect on their own efforts of predoctoral pediatric dentistry using programme diversity, learning outcomes, contexts and other variables.

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