



Comparison of the Postgraduate Orthodontics Curriculum in Mashhad Dental School with the Top Ten Dental Schools in the World

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Abstract

Background: Recognizing and reviewing the educational curricula of the specialized fields of dentistry and comparing it with the curricula of the top universities in the world will help to provide the necessary changes and corrections in postgraduate dental education, leading to more skilled specialists.

Objectives: The aim of this study was to compare the orthodontics post graduate curriculum of Mashhad dental school with the top 10 international dental schools.

Methods: Twenty-two of the world's top universities (10 main and 12 reserve) that offer orthodontics postgraduate programs were selected. A checklist including eight key factors and some secondary variables was prepared. These factors were classified as quantitative and qualitative. The checklist was filled with information provided by university websites and contacting program directors using email. A sample *t*-test and descriptive-analytic approach were respectively used to analyze the quantitative and qualitative data.

Results: Among the quantitative factors that were evaluated, only the "percentage of completely treated patients" was significantly lower in Mashhad dental school compared with that of the top 10 international dental schools. There was no significant difference regarding the length of study, the number of professors, and the number of patients visited by each resident. Among the qualitative factors, the most diversity was seen in certificates awarded to graduates.

Conclusions: No significant difference was observed in didactic education, clinical training, and research project conduction between the orthodontics post graduate program of Mashhad dental school and top-tier international universities.

Keywords: Orthodontics, Educational Curriculum, Postgraduate Courses

1. Background

Curriculum is defined as the sum of all experiences to be provided in an educational institution (1). It can also be defined as what should happen in a program for the purpose of teaching and everything that should be done to achieve this goal (2). Educational planning requires assessing the current situation (3).

In order to develop a curriculum, we must identify the appropriate methods for teaching knowledge and skills by identifying and examining the needs of learners, and develop a correct evaluation method to improve the quality of educational programs (4). Various factors are effective in the desirability of the curriculum, which include up-to-date scientific knowledge, adaptation to the needs of society, and ability to implement the curriculum. Therefore, the adequacy of the curriculum and how to implement it

should be constantly evaluated and reviewed (5).

Given that dental training programs and curricula include many visible and hidden sections that act as a system of interrelationships, a comprehensive evaluation should not be limited to measuring the final effects of the programs. A good evaluation covers all areas, inputs, outputs, processes and consequences of training programs (6). Curriculum revision is performed using scientific methods including extensive review and adaptation to similar curricula in prestigious universities around the world and using the opinions of experts in the field as well as those related to the program, including faculty members, students and graduates (7).

Donaldson et al. explored favorable approaches to globalizing dental education in all countries; collaborating, identifying and addressing common challenges, and sharing experiences and resources. However, the study

also indicated that implementing changes in dental education around the world is declining, leading to differences in the standards of dental education, both theoretically and clinically, between different countries, which jeopardizes the development of dental education. This situation additionally complicates the achievement of a set of universally accepted standards for use in the curricula across countries (8). Few researches have been done to compare the Iranian curricula of specialized fields of dentistry with those of top universities in the world.

In a study conducted by Zarandi et al., the features of the postgraduate periodontology curriculum in Iran was compared with the universities of Harvard, Maryland, and Toronto. The results of the study showed that the educational programs in all universities were lesson-oriented and offered theoretical units along with practical units in each semester. The duration of courses in all universities was 45 to 57 months. Generally, in non-Iranian universities, there was more emphasis on research work, and at the end of their studies, two degrees in periodontics were awarded to each assistant (9).

Dabaghi et al. conducted a study to compare the curriculum of five specialized fields of dentistry (orthodontics, pediatric dentistry, periodontics, prosthodontics, and maxillofacial surgery) in Iranian universities with the world top universities in terms of goals and programs, general structure, educational content, course length, and qualifications awarded at the end of the course. The findings of this study indicated that in most of the world top universities, graduates were awarded a master degree. However, in Iran, the equivalent of a PhD was awarded to graduates, and in the orthodontics field, Iranian universities have more intensive and comprehensive goals and missions (10).

2. Objectives

The aim of this study was to compare the orthodontics postgraduate curriculum of Mashhad School of Dentistry with the top ten dental schools in the world, with the intention of using the results to improve the quality of postgraduate orthodontic training.

3. Methods

This descriptive-sectional study was conducted in two main phases during the year 2020. The first phase aimed at searching and finding the best dental faculties in the world. For this purpose, the QS (Quacquarelli Symonds) and Shanghai world university rankings were used. Shanghai and QS are annual publication of world university rankings and are regarded among the three most influential and widely observed university rankings, alongside Times

Higher Education World University Rankings. QS designed its rankings to assess performance according to what it believes to be key aspects of a university's mission: teaching, research, nurturing employability, and internationalization. Its indicators for ranking are academic peer review, faculty/student ratio, citations per faculty, employer reputation, international student ratio, and international staff ratio. The Academic Ranking of World Universities (ARWU), also known as the Shanghai Ranking, ranks universities by criteria including quality of education, quality of faculty, research output, and per capita performance.

Then, considering the commonalities of these two rankings and the status of the orthodontic specialized educational program, 22 universities that were among the 50 highest ranked in both were selected (Table 1). The top ten were selected as the study universities and the others as the reserve list in case of not being able to obtain information regarding the curriculum and program of each selected university. Ten final universities which responded to our email and complete information regarding their curriculum was obtained were King's College London, University of California San Francisco, University College London, KU Leuven, New York University, University of British Columbia, University of Toronto, University of Iowa, University of Geneva, and The State University of New York at Buffalo.

In the second phase, in order to evaluate the curriculum of the selected universities, the checklist of Allareddy et al.'s (11) study was selected and according to other studies, corrections and changes were applied (12, 13). The final checklist contained items to determine the educational objectives, resources, teaching methods, residents assessment methods, duration of the course, certificates awarded to graduates, holding a mock board examination, the number of full-time and part-time professors present in the ward, the number of patients starting treatment with each resident, the percentage of patients completing treatment with each resident, the number of treatment methods taught to residents, the number of units per resident, and the number of assistants per resident. Furthermore, by searching the website of the desired universities or communicating via university email, the orthodontic course curriculum in the desired universities and the necessary information to complete the checklist items were collected.

The questionnaire sent by email contained 11 questions, five of which were intended for qualitative evaluation and the other six questions were intended for quantitative evaluation of the residency program and curriculum of selected universities.

The project proposal was approved by the ethics committee of the faculty of the Dentistry of Mashhad University of Medical Sciences

Table 1. Top Universities Ranked in the Quacquarelli Symonds and Shanghai World University Rankings

No.	Universities	QS Ranking	Shanghai Ranking
1	University of Michigan-Ann Arbor	3	1
2	King's College London	1	3
3	Harvard University	5	5
4	University of Washington	12	4
5	University of California, San Francisco	9	8
6	The University of Hong Kong	4	16
7	University of North Carolina at Chapel Hill	18	2
8	University of Pennsylvania	22	7
9	University College London	16	15
10	University of California, Los Angeles (UCLA)	27	6
11	KU Leuven	25	9
12	New York University	14	21
13	Tokyo Medical and Dental University	6	29
14	The University of Manchester	21	20
15	University of British Columbia	24	23
16	University of Copenhagen	29	26
17	Columbia University	35	31
18	University of Toronto	36	36
19	University of Adelaide	28	45
20	The University of Iowa	49	25
21	University of Geneva	42	43
22	University at Buffalo, the State University of New York	-	11

(IR.MUMS.DENTISTRY.REC.1399.085). All information obtained from corresponding with the universities, after receiving their tacit consent, is included in the article. One sample *t*-test and descriptive-analytic approach were respectively used to analyze the quantitative and qualitative data. The criterion for statistical significance was $P < 0.05$, 2-tailed.

4. Results

Comparing the duration of the orthodontic residency at the University of Mashhad with the top ten universities in the world, the shortest program duration was at the University of Iowa (24 months) and the longest was at the Universities of Geneva and KU Leuven (48 months). The mean \pm SD length of study in the top ten universities was 37.1

± 6.84 months, which was not significantly different from the length of study in the Mashhad dental school, which was 36 months ($P = 0.231$).

The lowest number of orthodontic professors was in King's College London with 3 and the highest number of orthodontic professors was in the University of Iowa with 15. The mean (\pm SD) number of orthodontic professors in the top ten universities was 9.6 ± 3.75 and there was no significant difference in comparison to the number of orthodontic professors in Mashhad dental school, which was 9 ($P = 0.625$).

The lowest number of patients visited by each resident corresponded to the University of British Columbia with 45 patients and the highest number of patients visited was related to KU Leuven with 135 patients. The mean \pm SD number of patients visited in the top ten universities was 84.5 ± 25.98 , which was not significantly different from the number of patients visited in Mashhad dental school, which was 70 ($P = 0.111$).

The lowest percentage of patients who received complete treatment by the initial resident was 60% from the University College London, whereas the highest percentage was from the University of Iowa and the University of Geneva with 100%. The mean (\pm SD) percentage of patients who received complete treatment by the initial resident in the top ten universities was $81.0 \pm 11.97\%$, which was significantly higher compared to Mashhad dental school, which was 60% ($P < 0.001$).

The lowest number of treatment methods was two for King's College London and the highest number of treatment methods was 20 for the University of California, San Francisco. The mean (\pm SD) number of treatment methods in the top ten universities was 8.20 ± 6.49 , which was not significantly different from the number of treatment methods in Mashhad dental school, which was 8 ($P = 0.925$).

The minimum number of nurses per resident was zero (KU Leuven) and the maximum number of nurses per resident was one (King's College London, University College London, and University of Toronto). The mean (\pm SD) number of nurses per resident in the top ten universities was 0.44 ± 0.40 , which was not significantly different from the number of nurses per resident in the Mashhad dental school, which was 0.5 ($P = 0.632$).

The number of units per resident in each of the top ten universities in the world and Mashhad dental school was one.

The comparison of the answers of the world top ten universities with Mashhad dental school regarding the orthodontic program's educational goals and resources, how to evaluate residents, and the degree or certificate awarded to residents at the end of the course is given in Tables 2 - 5.

Out of the 10 universities surveyed, only four (KU Leu-

Table 2. Comparison of the Answers of the Top Ten Universities with the University of Mashhad About the Educational Goals

University	Answer
King's College London	Our main goal is to cultivate professional and skilled dentists at the level of Master of Orthodontics. Our side goal is continuing education as well as the need to make progress in related sciences.
University of California, San Francisco	Combining basic science with clinical and behavioral education related to orthodontic treatment with a strong emphasis on active clinical experience, education and research (orthodontic master).
University College London	Develop the necessary skills and knowledge to: (1) diagnosis and treatment planning of orthodontic patients; (2) safe work by observing all aspects of safety and clinical governance; (3) using clinical, radiographic and ethnic information to identify treatment options; (4) planning available and practicable treatments, considering alternative ways and obtaining consent; (5) using appliances to get the best result.
KU Leuven	The first concern of the program is orthodontic education with the aim of advancement of postgraduate orthodontic education in Europe.
New York University	Headship in clinical excellence based on evidence-based orthodontics.
University of British Columbia	Educate efficient orthodontists on key decision making for diagnosis, treatment plan, patient communication, and treatment so that the best outcome for the patient is achieved.
University of Toronto	This course is a combination of scientific and clinical training to plan evidence-based treatment and treatment of complex patients, along with a strong research component to prepare residents to critically evaluate articles and conduct a research project (Master's Thesis).
The university of Iowa	Preparing skilled expert for orthodontic and dentofacial problems treatment; Providing clinical services to residents of Iowa; Educate students on scientific research methods.
University of Geneva	Completion of the course with mastery of theoretical and clinical knowledge of evidence-based orthodontics.
The State University of New York at Buffalo	Preparing graduates for clinical orthodontic work through extensive training, gaining clinical and research experiences and techniques.
Iran (Mashhad University)	Graduates of the orthodontics course must have the following abilities: (1) complete identification and diagnosis of dentofacial abnormalities and evaluation of the multilateral nature of these problems in relation to dentalalveolar disorders and functional and morphological disorders of the maxillofacio-dental system; (2) creating a deep understanding of biological knowledge and neuromuscular physiology and occlusion and relationship with clinical orthodontics; (3) have the necessary knowledge and skills in presenting the patient's clinical problem and documenting it and designing the most appropriate different treatment methods as prevention and correction of dentomaxillofacial abnormalities; (4) have the necessary knowledge and skills in establishing communication and providing services in connection with other specialized fields (for orthosurgical treatments, Cleft patients and syndromes); (5) ability to evaluate and use new research information in clinical therapies; (6) sufficient knowledge and ability in the field of research methodology and presentation of research projects in the field of orthodontics; (7) the ability of analytical thinking in orthodontics and teaching all subjects as a university lecturer.

ven, University of Toronto, the University of Iowa, University at Buffalo, the State University of New York) did not conduct a mock board examination. King's College London conducted only the practical and clinical section of the test and the University of California, San Francisco held only the written part of the test. The remaining four universities held both written and clinical sections of the mock board examination. The University of Mashhad also conducted both written and practical sections of the mock board examination.

5. Discussion

Mashhad dental school was at the same level as the studied universities with regard to the quantitative factors. Solely a significant difference was observed in the "percentage of patients whose treatment was completed by the starting resident", in which Mashhad dental school scored significantly lower than other universities. This might be due to treatment of much more difficult patients which need more time for their treatment, later initiation of cases in course, longer periods between patient visits and assigning less time to clinical work in the Mashhad

dental school in comparison with others. In order to decrease this discrepancy, we suggest to decrease the number of difficult cases (like canine impaction and surgery cases), early initiation of cases and shortening the time periods between patient visits.

In terms of qualitative factors, different universities stated different goals for their course but despite the apparent differences, one could see an overall similarity between all of them. In general, these goals fall into three areas: skills needed for advanced clinical work, skills needed to play a role in educating students, and working on research projects. These three areas were considered in the goals of all universities and minor objectives were selected to achieve these goals. Resources and teaching methods of the top ten universities in the world mainly include lectures, seminars, conferences, clinical experience, practical and research courses, international journals, 3D books and atlases, multidisciplinary treatment plans, close collaboration with the orthognathic surgical team, reference books, journal club, online courses, congresses and self-centered learning. In Mashhad dental school, in addition to a number of reference books and articles, conference presentations, seminars, research papers, chairside learning, multidisciplinary treatment plans, and collaboration

Table 3. Comparison of the Answers of the Top Ten Universities with the University of Mashhad Regarding the Educational Resources

University	Answer
King's College London	The three-year training program generally consists of the following three parts: (1) educational lectures, individual trainings, timed assignments; (2) clinical meetings in which residents treat patients under the supervision of a specialist; (3) master thesis. The program also addresses the following topics: (1) biomedical Sciences, (2) radiology, (3) materials science, (4) statistics, (5) scientific basics of orthodontics, (6) patient management, (7) human diseases, (8) research methodology, (9) professional responsibility.
University of California, San Francisco	Lectures, seminars, demos and conferences in combination with clinical experience. The course also provides strong training and clinical basics for interdisciplinary treatments including prosthodontics, periodontics, oral and maxillofacial surgery, craniofacial abnormalities, temporomandibular joint disorders, and facial oral pain.
University College London	(1) Clinical work, lecture, seminar, practical courses and research (using online education resources); (2) five sessions of personal therapy (each session for 4 hours) per week; (3) participating in a new clinic every week with the presence of an experience staff and training in that clinic; (4) research project with two supervisors and a statistical consultant.
KU Leuven	At the beginning of the course, a 3-month pre-clinic is held, which includes training on dentics. A number of classic articles along with Profit Book are considered as the main sources. A short examination is taken before starting clinical work. Digital methods include virtual reality and digital models are available for discussion about cases. The KUL Biomedical Library Account is available with access to international journals, books and 3D atlases. Multidisciplinary teams are formed, including restorative, pediatric, ENT, maxillofacial surgery, periodontics, and cleft lip and palate. For theoretical education, blended learning method based on the introduced resources and communication with the teacher is used for deeper learning.
New York University	(1) Courses in basic sciences, craniofacial development and materials science; (2) diagnosis and orthodontic treatment plan, mechanotherapy, growth and development and management of orthodontic treatment; (3) two-person training with our unique team method; (4) multidisciplinary treatment plan and close cooperation with orthognathic and craniofacial surgery team; (5) conferences and diagnostic lectures by the faculty; (6) rotation in private clinics (for clinical route).
University of British Columbia	Seminars and classes equipped with audio-visual facilities and the Internet. Clinical and digital facilities
University of Toronto	In addition to the articles and clinical training provided by professors, access to current dental journals, reference books, and various services that aid learning and research is provided.
The university of Iowa	Educational: Lecture presentation courses, seminars, clinical work and a research paper; Clinical: Various treatments from interventional to comprehensive treatment of patients; Laboratory: Evaluation of diagnostic casts, radiographs and clinical findings with the aim of space management and construction of a number of orthodontic appliances
University of Geneva	Course-based education, seminar-based education, case treatment plan discussions; interdisciplinary team discussions, journal club, online courses, congress, self-centered learning, library access (books and journals)
The State University of New York at Buffalo	Seminar, lecture, learning chair side, review of articles, interdepartmental meetings, out-of-college courses Residents work in teams with the cooperation of faculty to create a model of medical education and propagate the learning experience.
Iran (Mashhad University)	A collection of articles, lectures, seminars, research paper, multidisciplinary treatment plan and collaboration with orthognathic and craniofacial team, learning chairside; Books include: (1) Nanda R: Esthetics and Biomechanics in Orthodontics 2nd Ed. 2015; (2) Proffit WR, Fields H, Sarver DM: Contemporary Orthodontics 6th Ed. 2019; (3) Proffit WR, White RP, Sarver DM: Contemporary Treatment of Dentofacial Deformity 1st Ed. 2003; (4) Graber LW, Vanarsdall Jr, Vig KWL, Haug GJ: Orthodontics: Current Principles and Techniques, 6th Ed. 2017; (5) Huang, Richmond, Vig: Evidence-Based Orthodontics, 2nd Ed. 2018; (6) Burststone CJ, Choy K: The biomechanical foundation of clinical orthodontics, 1st Ed. 2015; (7) Naini FB, Gill DS: Orthognathic Surgery: Principles, Planning and Practice 1st Ed. 2017

with the orthognathic and craniofacial team are essential components of the school's curriculum. Also, a number of resident assessment methods, including written, oral, and practical exams, are used at all universities in the current study. Moreover, other methods include case evaluation, passing the written section of the orthodontic board exam, chairside feedback, on-the-job evaluation, scientific evaluation by publishing articles in international journals, and defending a specialized thesis in the presence of a jury, professional and ethical interactions with patients, professors and staff and active presence and participation in class activities are considered complementary methods by different universities. Among the top ten universities in the world, six hold the mock board examination, as does Mashhad dental school. The qualifications that graduates receive at the end of the course vary considerably between universities in different countries and depend on

the laws governing the health system of each country. The highest number of degrees awarded to graduates among the universities under study is a master's degree, which is awarded in seven universities. The orthodontic specialty certificate, board and PhD degrees are also awarded at five, four, and one university, respectively. Graduates of Mashhad dental school receive a master's degree and a specialized board of Iranian orthodontics degree.

Dabaghi et al. in their study showed that despite minor differences between Iran and the world's universities, similar curricula were generally used. The differences mentioned in this study between the curricula of the top ten universities in the world and Iran include the existence of more comprehensive and extensive goals and missions in the curriculum of Iranian universities, a longer course duration in some fields in the world's leading universities and differences in the type of degrees awarded at the end of the

Table 4. Comparison of the Answers of the Top Ten Universities with the University of Mashhad on How to Evaluate Residents by Universities

University	Answer
King's College London	Written exam, oral exam, case evaluation, OSCE.
University of California, San Francisco	All residents are required to pass the written portion of the American Orthodontic Board exam before the end of the course.
University College London	Formative and Summative methods, include: (1) chairside feedback, (2) workplace assessment, (3) written exam, (4) wire bending skills, (5) osce, (6) thesis completion, etc.
KU Leuven	Residents are evaluated based on the logbook and teacher feedback. This logbook includes pre-clinic, clinic, scientific and professional. This guarantees continuous evaluation. An annual written test is held in years 1, 2, and 3, and finally a board test with several treated cases in year 4. The scientific evaluation is done in the form of publishing two articles in international journals and defending a specialized thesis in the presence of an international jury.
New York University	Written and oral exam at least twice a year to assess items such as: professionalism and ethics, information and skills, patient care, communication skills, work-based learning, system-based learning; Performance indicators: (1) course grades; (2) assessing the program based competency; (3) professors' Assessment of clinical performance and ensuring patient-centered treatment; (4) professional and ethical relations with patients, professors and staff; (5) the quality of research progress or scientific activities.
University of British Columbia	Written and oral exams, written assignments, evaluation of patient records and treatment progress at each patient visit
University of Toronto	In most training courses, multiple presentations are made by residents. Active attendance and participation in class activities along with the midterm and final exams determine the final scores of the residents. In the clinical section, residents are evaluated daily by the clinic professor and supervisor.
The university of Iowa	Submission of dissertation, written and oral exams, presentation of cases, clinical evaluation, OSCE, etc.
University of Geneva	Daily assessment in seminar, daily assessment in clinic, written and oral exam; Practical exam (wire bending, treatment planning, etc.), evaluation in the research project.
The State University of New York at Buffalo	Residents complete written examination of the American Orthodontic Board prior to graduation and are encouraged to obtain board certification; Written and oral exams; Practical exams; Evaluation of master research project.
Iran (Mashhad University)	Intersession exams, annual exams, practical exam, logbook review.

Table 5. Comparison of the Answers of the Top Ten Universities with the University of Mashhad Regarding the Degree Awarded to Residents

University	Answer
King's College London	Master of Sciences; Membership in Orthodontics - Royal College of Surgeons (MOrth - Royal college of surgeons).
University of California, San Francisco	Orthodontic specialty certificate; Master of sciences in craniofacial sciences.
University College London	Master's degree in clinical dentistry (MCLinDent); Membership in orthodontics - royal college of surgeons (MOrth - Royal college of surgeons).
KU Leuven	Orthodontic specialty certificate
New York University	American Orthodontic Board Certificate (all graduates); Certificate of orthodontic education (educational path); Postdoctoral degree in orthodontics (research path)
University of British Columbia	Master of Sciences in craniofacial sciences; Diploma in orthodontics; Certificate of the national examination of dental specialty; Fellowship (after passing the Royal College of Canadian Dentists exam); Diplomate of the American Board after passing the American Orthodontic Board exam.
University of Toronto	Orthodontic specialty certificate; Fellowship at the Royal College of Canadian Dentists; Diplomate degree (American Orthodontic Board).
The university of Iowa	Master of science; Orthodontic specialty certificate
University of Geneva	Master of Science; Orthodontic specialty certificate; Specialized board degree within 5 years
The State University of New York at Buffalo	Master of science; Advanced degree in orthodontics
Iran (Mashhad University)	Master of science; Iranian Orthodontic Board certificate.

course, which is similar to our study in terms of the difference in the degree awarded. However, in terms of differences in the objectives and length of the course, they are slightly different from the results of our study (10).

The findings of our study are in line with those of the Park et al. study, which reviewed orthodontic training programs at US and Canadian universities in terms of duration of study, the number of patients treated by residents, the degree awarded to graduates, the number of full-time and part-time professors, and the number of patients visited by each resident. Contrary to the findings of our study, many

of the universities surveyed in the study did not conduct a mock board examination. However, it was claimed that during the course, residents acquired the necessary scientific and practical preparation and skills to succeed in the orthodontic board exam (12).

The results obtained by Zarandi et al. showed that there was more emphasis in the curriculum of American and Canadian universities in the field of research than the Iranian curriculum and some differences between the studied universities in terms of the length of the course (9). Nevertheless, in the present study, there was no signif-

icant difference in the emphasis on research work in the orthodontic curriculum and program of Mashhad dental school and the top international universities. Given the differences in the field and the universities studied in the above articles, such a result is not unexpected.

Ghaffari et al. conducted a comparative study to compare the general medical curriculum in Iran with the general medical curriculum of some selected countries from all continents in terms of overall structure and length of the course, the mission and objectives of the curriculum, the educational content of the course, the number of sections and their types, the role and position of graduates and the implementation of medical education quality improvement strategies in educational programs. The results of the study showed the incompetency of Iran's general medical program in comparison with the selected curricula in terms of meeting the desired indicators of the efficient curriculum (14). However, in our study, wherein the orthodontic postgraduate curriculum and program was studied, no difference was observed between Iran's educational program and that of other countries, and most of the basic criteria influencing the usefulness of the orthodontic postgraduate curriculum and educational program based on Allareddy's study were in compliance with international standards.

5.1. Conclusions

The results obtained by comparing the postgraduate orthodontic training program and curriculum in Mashhad dental school with the top ten universities in the world show that the orthodontic postgraduate curriculum and program in the Dentistry School of the Mashhad University of Medical Sciences has suitable standards and complies with the key criteria of the educational programs of the world's leading universities in fields of theoretical education, clinical education, and research projects. In other words, there was no significant difference between them in terms of the length of study, the number of professors, the number of patients visited by each resident, the number of treatment methods taught, the number of units and assistants per resident, educational objectives, educational resources and methods, evaluation methods, and holding a mock board examination. Only in the percentage of patients whose treatment was completed by the initial resident and certificates awarded to graduates, significant differences were observed.

Footnotes

Authors' Contribution: Study concept and design, M. A. and H. B.; analysis and interpretation of data, M. A. and N. A.; drafting of the manuscript, A. G.; critical revision of the

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