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Review

Foreign-Trained Dentist vs. International Medical Graduate: What Can We Learn from International Medical Graduate Literature?

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Abstract: The United States of America has traditionally attracted people from various countries, including physicians and dentists, who wish to further their education and career in the U.S. international medical graduates' (IMGs) role has been shown to be vital in medical academics and healthcare delivery systems. IMGs' demographics, contribution to the U.S. healthcare system, education and research, and challenges in the U.S. medical system have been extensively investigated. However, similar data are limited to foreign-trained dentists (FTDs). This study reviews the current literature related to IMGs and FTDs and proposes some recommendations for future studies.

Keywords: foreign-trained dentist; international medical graduates; career; practice pattern; challenges

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1. Introduction

The United States' medical and dental education attracts scholars worldwide to pursue training in the United States (U.S.). Many international medical graduates (IMGs) matriculate into the U.S. medical education system to pursue advanced medical training, conduct medical research, teach, and in general, seek better career opportunities [1–3]. Following their training, many IMGs join the U.S. workforce through private practice, academia, the federal government, or a research facility [2,4,5]. Currently, 25% of the U.S. physician workforce are IMGs [6]. It has been predicted that by 2020–2025, there will be a shortage of 200,000 physicians in the U.S., resulting in a 20% gap in required healthcare coverage [7] that could potentially be filled by IMGs.

Foreign-trained dentists (FTDs) matriculate into the U.S. dental educational system via several different pathways: enrollment in an advanced standing (AS) program, advanced dental education (ADE) [8–10], or a graduate program (MS or PhD). According to the 2020–2021 American Dental Association Survey of Dental Education, approximately 70% (46/66) of U.S. dental schools offer an AS program, with a total of 655 FTDs admitted on an annual basis [11]. A total of 5.7% of the 6308 first-year dental students for the academic year 2020–2021 were non-U.S. and non-Canadian citizens [11].

Other countries face a similar phenomenon of foreign-trained dentists moving there to practice or obtain additional training [12,13]. In Europe, attempts to calibrate the educational background of graduates of different countries have been made. A total of 48 countries currently form the "European Higher Education Area" with the objective of standardizing higher education among its members in an effort to promote the mobility and employability of the graduates among the member countries [14]. Despite this effort, a recent investigation on the status of homogeneity among higher educational programs, including dental, in those countries highlighted the existing variations between the programs [15]. One can assume that this translates to graduates of different countries having

different background knowledge. Focusing on the dental field, in the U.K., some of the challenges identified in this dental professional immigration were: (1) difference in the level of clinical experience during undergraduate studies among graduates of different countries and (2) graduates of states members of the European economic area (EEA) not fully understanding the implications of practicing in the U.K. The difficulties faced by practicing foreign graduates in the U.K. have been attributed to the following deficiencies: lack of clinical knowledge and experience, lack of understanding of the culture of healthcare in general and dental care in the U.K., and lastly, inappropriate attitudes and inadequate induction training on arrival in the U.K. [12]. The need for additional induction training for non-U.K. EEA dental graduates prior to practicing in the U.K. has been proposed to ameliorate the aforementioned deficiencies [12]. Unfortunately, there is limited data for other countries that might be the destination of foreign-trained dentists that elaborate on their experiences or performance.

All U.S. advanced dental education (ADE) programs accepted FTDs (Table 1) [16], with oral maxillofacial and surgery programs having the lowest matriculation rates (1.3%), followed by general practice residency (4.8%) and pediatric dentistry (7.2%). FTDs constitute the majority of postgraduate students in dental public health (76%) and oral and maxillofacial pathology programs (47.3%). However, ADE programs in general dentistry (202/940, 21.5%), prosthodontics (169/472, 35.8%), and periodontics (162/575, 28.2%) have a higher absolute number of FTD residents. A slight fluctuation in the numbers of FTDs who matched in the Postdoctoral Dental Matching program from 2017 to 2018 has been noted [8]. In 2018, prosthodontics and periodontics had the highest number of FTDs that matched, followed by orthodontics [8]. These data may suggest a significant contribution of FTDs to the ADE programs in U.S. dental education.

Table 1. Enrollment in advanced dental education programs, 2020–21.

Advanced Dental Education Programs	Total	FTD %	FTD #
Advanced Education in General Dentistry	940	21.5	202
Prosthodontics	472	35.8	169
Dental Public Health	50	76.0	38
Endodontics	477	11.1	53
General Practice Residency	1231	4.8	59
Oral and Maxillofacial Pathology	55	47.3	26
Oral and Maxillofacial Radiology	50	26.0	13
Oral and Maxillofacial Surgery	1228	1.3	16
Periodontics	575	28.2	162
Orthodontics and Dentofacial Orthopedics	1098	10.0	110
Pediatric Dentistry	972	7.2	70

# denotes numbers.

Details on the origins, goals, challenges, and experiences of the FTDs in the U.S. to further their education and careers would be valuable information in order to understand this type of professional immigration. A recent PubMed search (22 July 2022) conducted with keywords "International Medical Graduates" and "Foreign-Trained Dentist" revealed 22,142 and 347 results, respectively. Extensive studies on IMGs' trends and characteristics, their contribution to research, and diversity have been well-documented. However, studies on the role of FTDs in the U.S. health care system are lacking. The purpose of this article was multi-fold: (1) to describe the demographics and contributions of IMGs to the U.S. medical healthcare and educational system, (2) to review the current literature on FTDs, (3) to relate the IMGs' information to that of current FTDs, and (4) to propose some future investigations.

2. Materials and Methods

The primary question for this literature review was: foreign-trained dentists vs. international medical graduates: what can we learn from international medical graduate literature? This literature review evaluated articles obtained via the National Library

of Medicine's PubMed website, using keywords of foreign-trained dentists and international medical graduates with various combinations of the terms demographic, healthcare, residency, practice pattern, education, research, and challenges. Only articles published between 2000 and 2021 were included in the study. The "foreign-trained dentists" and "international medical graduates" terms were used because these are the most commonly used terminologies in the American Medical Association and Dental Education realm, respectively. A structured literature search limited to English was conducted. Abstracts were selected and screened; selected full-text articles were reviewed when appropriate for this review manuscript. Due to the nature of the question investigated, a qualitative approach was used.

3. Results

3.1. Current Status of IMGs in the Literature

3.1.1. IMGs' Demographic Data

IMGs tend to be older, have more clinical experience, hold more advanced degrees, publish more scholarly work, and have less educational debt in comparison with U.S. medical graduates (USMGs) and U.S.-born IMGs [17–19]. IMGs compose a quarter of the current U.S. healthcare professionals [1,7,20,21]. Between 1975 and 2003, the number of IMGs increased by 160% [21]. The U.S. is projected to have a shortage in the physician workforce in 2030 [22], and IMGs could be a suitable supplement and resource for the U.S. health care system [23,24].

The distribution of IMGs in the U.S. differs across geographical regions and medical specialties. A total of 40% to 70% of IMGs originated from countries such as Lebanon, Peru, and countries in Africa and the Caribbean [25]. A total of 14% of IMG residents were located in California in 2000, while nearly 52% were in New York state in 2000 [7]. Participation of IMGs had doubled and tripled in family medicine and obstetrics/gynecology from the academic year 1995/96 to May 2004, respectively [23]. In U.S. primary care programs, IMGs constituted 40% of providers in 2004 [21]. This number represents half of all first-year family practice residency positions in 2006 [2] and more than 30% of the residents in psychiatry in 2008 [26]. Recent data indicated that when compared to the total graduate medical education (GME) pool, IMGs showed greater representation in family medicine, internal medicine, neurology, pathology, pediatrics, and plastic surgery specialty programs (Table 2) [27].

Table 2. IMGs representation in the graduate medical education specialties [27].

Specialties	IMGs %	# IMGs/Total
Allergy and Immunology	18.4	58/316
Anesthesiology	12.8	816/6388
Dermatology	3.8	57/1497
Emergency Medicine	5.6	466/8321
Family Medicine	26.0	3572/13,745
Internal Medicine	39.0	11,193/28,677
Neurology	32.4	1007/3108
Obstetrics and Gynecology	7.3	412/5608
Ophthalmology	4.7	63/1348
Orthopedic Surgery	1.5	63/4335
Pathology-anatomic and Clinical	49.1	1121/2281
Pediatrics	20.5	1867/9098
Plastic surgery	22.3	43/193
Psychiatry	18.7	1262/6745
Radiology-diagnostic	13.9	598/4311
Surgery-general	14.5	1397/9645
Urology	3.6	63/1741

# denotes numbers.

3.1.2. IMGs' Contribution to the U.S. Healthcare System, Education, and Research

IMGs have made a positive contribution to the US healthcare system [2,4,28]. They help diversify the U.S. health workforce [6,29]. A total of 17% of the full-time faculty at U.S. medical schools are IMGs [2]. A recent study reported that 10.3% of academic plastic surgeons were IMGs, mostly originating from India, Brazil, and U.K. [29]. Academic IMGs' scholarship performance was comparable to that of USMGs; however, results indicate that IMGs received less NIH funding [29].

Among actively practicing physicians, IMGs show greater representation in the specialties of internal medicine, neurology, psychiatry, and pediatrics [30]. IMGs are more likely to pursue specialties based on societal needs as opposed to personal interests [25]. After the completion of training in graduate medical education, between 70% and 75% of all IMGs eventually enter practice in the U.S. [25]. While this may cause concern for USMGs, IMGs target a different job market that often is perceived as unfavorable by most USMGs [25]. These areas are less favorable due to the presence of large, deprived patient populations; lower initial salaries; reduced access to advanced technology; minimal subspecialty opportunities; and reduced cultural amenities. Often, services in general or primary care medicine, which may be unpopular positions for many U.S. trainees, are cherished opportunities for IMGs. IMGs cover 25% of the healthcare needs in health professions shortage areas (HPSA), in comparison to 8% from National Health Service Corps and another 8% from USMGs.[2] Furthermore, IMGs are twice as likely as USMGs to serve with city or county government,[2] and they serve in hospitals that disproportionately provide care to the poor and other vulnerable members of the U.S. population [20,21].

3.1.3. Challenges for IMGs in the U.S. Medical System

While IMGs' contributions to the U.S. healthcare system have been established, these professionals face different challenges related to entering the U.S. medical schools, succeeding in residency, and practicing in the U.S. medical industry. Each area of these challenges will be described in detail below:

Matriculating into a Residency Program

IMGs who successfully matched in a U.S. program performed very well in medical school, had an additional degree(s), and had 2 years of research experience before applying to the match to hopefully enter a residency or a fellowship [31]. The match process uses a computerized algorithm that takes the ranking list of the applicants by the program site and the applicant's preferred placement of programs and matches them [32]. IMGs are more likely to match in a community-based program compared to the USMGs, who are more likely to enter a hospital-based academic program [33]. The challenges for IMGs are similar to those that confront international students in general. These include language proficiency, social and educational acculturation, and self-perceived and actual discrimination [34–37]. Other barriers, including economic and immigration issues or difficulty in seeking out a potential mentor, may also hinder their admission into U.S. medical schools [1,21,23,28,38]. Between 1984 and 2004, the cost of U.S. medical education increased by 165% for private and 312% for public medical schools. Additional costs for international candidates include travel and lodging expenses [21], on top of the admission fees for the United States Medical License Examination (USMLE) and clinical-skills examination. The USMLE is administered by the National Board of Medical Examiners and offers state medical boards a common evaluation system for licensure candidates. The test consists of three different parts, which include basic sciences, clinical knowledge, and skills applied to supervised patient care and clinical knowledge and decision making for independent patient care, respectively [39]. A roadmap that outlines the processes for certification, residency application, interview, matching process to the medical schools, and visa application [1] has been created to assist international applicants in navigating the system.

Challenges in selecting an applicant who is a "good fit" and in predicting the success of IMGs, from the perspective of the U.S. medical schools, have been discussed before

in the literature [17,40,41]. Most schools gauge candidates' probable success based on measures such as USMLE scores, grades, class rank, and memberships in certain medical organizations. However, USMLE scores, research publications, and advanced degrees have been shown to not predict residents' performance [17]. For example, there has been a debate on the difficulty and the lengthy process needed to verify publications in foreign language journals, the publication outlets for most IMGs [42]. Meanwhile, soft skills such as professionalism, communication, and interpersonal skills, which may be more relevant in indicating the future success of managing the doctor–patient relationship, have been more challenging to assess [17]. In Alberta, Canada, the Alberta International Medical Graduate program utilizes, along with other tools, the model of multiple mini-interviews to assess professional competency for IMGs. The multiple mini-interviews are an established tool used widely in medical schools worldwide for the assessment of non-cognitive skills [40].

During Medical Residency Training

During medical training in the U.S., language and aspects of communication remain a barrier for most IMGs, along with acculturation challenges such as understanding American popular and medical culture, residing in an unfamiliar environment, and undergoing other social and psychological challenges [17,20,21]. Difficult acculturation issues are more likely to be encountered by individuals with cultural values, goals, and communication styles that contrast with those of the U.S. [43].

Challenges in understanding the U.S. medical system have also been identified as a barrier. For example, IMGs faced more difficulty in performing computer skills needed for evidence-based medicine search. They were more likely to be trained in medical contexts where negative attitudes were prevalent and little support was available for evidence-based resources [44]. Previous training also has an impact on IMGs' clinical decision making compared with USMGs [18].

Joining the U.S. medical System as Professionals

Upon graduation from residency training, some IMGs accept fewer income-generating positions than USMGs [25]. IMGs also tend to practice in primary care specialties and in underserved and rural areas [24]. While they are more willing to work in large non-urban areas, they are also more likely to encounter acculturation challenges there, as these communities tend to be less diverse than those in urban settings [25]. Other language and cultural barriers continue to challenge IMGs as they engage in doctor–patient relationships. Therefore, understanding colloquial speech, patient dialects, body language, eye contact, speech inflection, and assertiveness are needed [25,26,34,36,45].

The competency of IMGs is often questioned due to their training backgrounds that might not be fully compatible with U.S. medical training [25]. Published studies that compared IMGs and USMGs did not sufficiently define both groups, and this can lead to inaccurate overgeneralization of the conclusions. The question of competence might be a result of prejudice against as well as low self-esteem of IMGs [25].

The proportionally higher presence of IMGs, compared with USMGs, in health professional shortage areas (HPSA), has been correlated with the fact that the IMG residents have temporary visas [7]. Their desire to obtain waivers of the temporary visa rule many times has led them to serve for 3 years in HPSA. This observation suggests that IMGs might be a short-term solution to the shortage of physicians in the U.S.

3.2. Current Information on FTDs in the Literature

Information on FTDs, such as demographic data, and different challenges related to entering the U.S. dental schools, succeeding in the training programs, and participating in the U.S. dental workforce, is lacking. Therefore, more studies are warranted to understand this cohort and help minimize their impediments to success in the U.S. oral health care system.

3.2.1. FTDs Demographic Data

The origins of FTDs licensed in the United States were explored and analyzed [46]. The results indicated that the greatest number of potential foreign-trained U.S. dental licensees were primarily from Asia, followed by the Middle East and South America. Further studies are needed to generate more exact data about FTDs who practice in the U.S.

3.2.2. Admission to U.S. Dental Education System

Admission to the Advanced Standing (AS) Program

Most studies on FTDs focused on AS students' performance in their programs [47,48]. The University of Pacific study examined the type of admission tests to predict FTDs performance [31] and concluded that the preclinical laboratory test (bench test) and standardized Test of English as Foreign Language (TOEFL) had predictive power for selecting students who would perform well in the program. However, the authors cautioned that the tests should be considered conservative estimates since the range of potential correlations between the tests was highly restricted.

The TOEFL, National Board Exam (or NBE, a high-stakes, two-part U.S. dental licensure examination for students and professionals in dentistry) part I, and cultural norm of long-term view were the most positive predictors of AS students' academic performances [48]. On the contrary, others had demonstrated that NBE part I, TOEFL, and faculty interviews added no significant value in predicting academic performance and clinical competency for AS students. Instead, NBE part II and dexterity measures significantly did [47]. Further, FTDs demonstrated the same academic performance as the United States trained dentists (USTDs), based on the National Dental Examining Board written examination and objective structured clinical examination (OSCE) [49]. According to self-reported data, the majority of FTDs reported that their knowledge and clinical skill improved after they completed the AS program [50].

Admission to the Advanced Dental Education (ADE) Program

Studies investigating the impact of matriculated FTDs on ADE are lacking. Only one study reported on the FTDs' perceptions of their training and their future goals in advanced education in prosthodontics [51]. Matriculated FTDs in prosthodontics programs had different demographic and social characteristics compared with their USTDs counterparts. FTDs were frequently single, had more advanced degrees, had more work experience before entering the program, obtained more financial support from family, and had a higher interest in academic careers.

3.2.3. Joining the U.S. Workforce as Professionals

Pathways to work between FTDs entering AS and those entering ADE may be different. FTDs entering the ADE program may be supported by their government/institution/family members; therefore, they need to return to their countries to share the advanced knowledge and experience they accumulated in the U.S. [51]. In contrast, FTDs entering AS program usually have the intention to migrate to the U.S. due to political and social issues [52]. Further study is needed to confirm this hypothesis.

FTDs often apply for an H-1B visa (working visa for non-immigrant aliens in specialty occupations) to work in the U.S. [53]. The proportion of FTDs in nonacademic settings has increased slowly from 4.4% in 2002 to 5.3% in 2009 and to 5.6% in 2016. In addition, the participation of FTDs in academia has increased multiple folds from 3.3% in 2006 to 9.1% in 2009 and to 13.1% in 2016 [53]. Dental schools have been gradually recruiting FTDs to fill faculty vacancies [8,54].

The practice patterns of FTDs and USTDs were investigated. The practice behaviors of FTDs in Washington State had shown that FTDs were less likely to participate in the Medicaid program, and their practice patterns were not significantly different from USTDs [55]. The authors speculated that the practice pattern may be related to the practioners' dental school debt. The need for a national analysis of the practice pattern of newly licensed

FTDs and USTDs was also suggested to address the access to oral health care in vulnerable populations [55].

4. Discussion

The literature reviewed in this article highlighted many challenges in transitioning IMGs into the U.S. healthcare system and academia. The challenges range from credentializing to problems in didactic and clinical performance and personal/cultural differences. IMGs come with different educational and cultural backgrounds, and this influences their adaptation and transition into the new U.S. educational system and workforce. Different approaches have been proposed to overcome IMG-faced challenges in an effort to solve these issues. For example, their training and assessment of competency should include communication and cultural-competency modules to address language and cultural barriers, including eye contact, body language, and assertiveness needed for maintaining a positive doctor–patient relationship in the U.S. [26,35,45]. Others suggested that IMGs should be better supported for improved acculturation process and academic success by pairing them with USMGs [20]. In addition, IMGs should be supported by addressing their previous medical experiences and cultural beliefs that may not be compatible with U.S. medical guidelines [18] and by providing other staff, residents, and faculty members with diversity training and cultural awareness about IMGs' backgrounds [26].

This literature review also underscored the lack of data on FTDs and their related challenges in transitioning into the U.S. dental systems. The insight from the existing literature on IMGs could serve as a foundation to study the characteristics and impact of FTDs in the U.S. dental practice and academics. Similar to IMGs, the role and participation of FTDs could have a positive impact on the U.S. dental practice workforce and academics [51]. FTDs' participation in the AS and ADE programs is predicted to increase in the future. A previous study has shown that most of the FTDs are top students in their countries and the majority show a strong interest in academics or research [51]. Many FTDs play a significant role in academics, either serving as prominent researchers or dental educators/administrators. With the proliferation of new dental schools, FTDs may be a quality resource to fill vacant faculty positions [56]. A study from Washington State discovered that the practice pattern of FTDs is similar to USTDs, contrary to IMGs' practice pattern [55]. However, one recent study indicated that patients prefer a physician of the same race [57]. Therefore, it is important to have a diverse physician workforce to fill the vacancies for healthcare services, particularly to deliver care for minorities and elderly populations [57,58]. In preparation for this workforce shift, policymakers should create programs and establish policies to better support FTDs who pursue an academic career or a career as practicing dentists in the U.S. During their education in the U.S., FTDs could be provided opportunities to learn more about the U.S. culture. Some of the potential policy changes have already been utilized in the medical field with IMGs, with different levels of success. An example could be providing incentives in the form of visa waivers or a "fast track" green card process for FTDs who choose to serve underserved communities or pursue academia. A similar incentive-based recruitment system is already being used for the USMDs who choose to serve in academia or areas with limited access to care. In their case, the incentives are financial, i.e., loan repayment [59].

A summary of reasons for the failure of FTDs when matriculating to the U.S. education and healthcare system based on the previously published IMGs data is presented in Table 3. Unfortunately, the information on the participation of FTDs in the U.S. dental healthcare workforce and academics is still limited. For example, information about the current or expected growth of AS programs is lacking. Additionally, the specifics of different AS or ADE programs in the overall experience they provide to their FTDs, inside and outside of clinical work, are lacking. Therefore, a more comprehensive study of FTDs' impact, presence, and future in U.S. oral health care and academics is warranted. Additionally, the perspective of the FTDs on their experiences in the U.S. is vital as it will allow for a clearer understanding of the shortcomings or successes of the established systems that cater

to this cohort. In the future, FTDs' characteristics, challenges, expectations, and desires, matriculation process in enrolling in the U.S. dental education and dental practice, and participation in the U.S. dental academics and research should be explored.

Table 3. Reasons for failure for foreign-trained dentists during their matriculation into U.S. dental education. Adapted with some modification from Horvath K, Pellegrini C. Selecting international medical graduates (IMGs) for training in U.S. surgical residencies [28].

Reasons for Failure
I. Credential Issues
II. Poor performance
1. Knowledge related problems
a. Inadequate level of dental knowledge
b. Poor command of English, both receptive and expressive
c. Difficulty in adapting to the technology/material/procedures in clinics
d. Lack of attention to the working of the healthcare system
e. Poor time management and multitasking techniques
f. Poor synthetic reasoning skills and inability to understand how to execute standards in patient dental evaluation and management.
2. Personal/cultural problems
a. Interpersonal difficulties with faculty, residents, staff, and patient
b. Lack of acceptance of deficiencies and inability to accept constructive criticism
c. Poor work ethic
d. Poor adjustment to the fast pace of residency training in a large dental school system
e. Lack of self-learning ability and self-motivation

5. Limitation of the Study

In this study, the authors acknowledge some limitations. The investigators used English-only literature, one search engine (Pubmed), and keywords limited to FTDs and IMGs. Additional available literature and topics may not be represented and discussed in this review article. The findings of the study also are primarily related to the journey of FTDs and IMGs entering the U.S. educational and health care system, so they may not be applicable to other countries.

6. Conclusions

An extensive literature review about IMGs' characteristics, challenges in their training, and their practice pattern, as well as their contribution to the U.S. healthcare workforce and academics, was presented. Similar to IMGs, FTDs also have great potential to support U.S. oral health care and academics. However, information on the current status of FTDs in the U.S. is still lacking. Longitudinal studies are needed to better understand the implications for FTDs composition and distribution and their potential impact on dental education, research, and healthcare.

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