Caspian Journal of Dental Research
e-ISSN: 2322-2395 p-ISSN: 2251-9890
Babol University Of Medical Sciences

An Overview of Dental Assistants' educational Status and Performance in Iran

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Article Type

Research Paper

ABSTRACT

Introduction: Demanding qualitative dental services calls for hiring competent staff in dental offices. This study was designed to evaluate dental assistants' educational status and ability to perform tasks.

Materials & Methods: In this cross-sectional study, 200 dental assistants working in the offices and clinics of Isfahan, Iran during 2020 were selected using random systematic sampling. The researcher-made evaluation tool with a content validity index of 0.77 was used. Tasks were evaluated by 13 items in 6 sub-scales including communication skills, preparation, radiography, cooperation with dentists, health promotion through prevention and infection control. Moreover, information was requested about the education and training course of the dental assistant. The score of ability was achieved at the range of 0 to 20. The relationship between gender and training course as well as between age and experience level was evaluated with Mann-Whitney test and Spearman correlation.

Results: The most frequent major of the study was accounting. The mean total ability score of the dental assistants was 19.1±6.5, ranging from 17.7 to 20. The highest and lowest ability scores were related to the cooperation with dentists and health promotion through prevention, respectively. The mean ability score had a weak relationship with age but had no significant relationship with experience. The mean ability score only in the area of radiography had a significant relationship with the training course and gender (P=0.012).

Conclusion: Despite the diversity in the degree and field of study, the ability and task status of the assistants was desirable. In the area of health promotion through prevention, there is a need for training and monitoring its implementation.

Keywords: Dental Assistants, Health Education, Education

Received: 22 Nov 2021
Revised : 23 Jan 2022
Accepted: 15 Mar 2022

Cite this article: Baghban Y, Asgari I. An Overview of Dental Assistants' educational Status and Performance in Iran. Caspian J Dent Res 2022; 11:38-45.

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Publisher: Babol University of Medical Sciences

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[DOR: 20.1001.1.22519890.2022.11.1.8.4]
[DOI: 10.22088/cjdr.11.1.38]

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Introduction

For many years, the term dental auxiliary has been used for dental assistants, dental hygienists and dental laboratory technicians. However, from 1990, the staff associated with the practice of dentistry are referred to as "allied dental personnel". Since dental assistants should assist dentists during diagnosis and treatment procedures, their duties are broad in terms of knowledge, skill levels and function. Some references have categorized dental assistants into chair-side assistants, office assistants, expanded duty dental assistants and laboratory assistants. [1] Generally, the main duties of a clinical chair-side assistant, which is the more common term, are preparing the patient and working directly with the dentist to provide high-quality care. In many countries, dental services are provided to people in the form of a dental team including the dentist, one or more chair-side- and support assistants, expanded duty personnel and the hygienist. [2-4]

Dental assisting is one of the few health careers in which formal education is preferred but not necessary for job entry. A dental assistant can be either on-the-job training (OTJ) or a graduate of dental assistant programs. Since 1930, in the USA, the American Dental Assistant Association (ADAA) and the Council on Dental Education of the American Dental Association (ADA) have developed the "accreditation Standard for Dental assisting programs", which usually lasts 9 to 18 months. [1-3] Accredited Dental Assistant (ADA) in the United States [5] and HLT35015 III and HLT45015 IV National Professional Certificate in Australia [6] are the most famous programs for dental assistants' education.

In Iran, there is no formal education path for dental assisting. There is not any document about informal training courses or apprenticeship training either. Commonly, the volunteer applicants for dental assistance in several university-related or independently-approved institutions hold training courses; at the end, if the quorum is obtained, the participants will be awarded a certificate.

Common duties of a chair-side- dental assistant include greeting and receiving patients, preparing, assembling and sterilizing the instruments and equipment, assisting the operator during treatment, applying oral hygiene and diet concealing, and implementing infection control and waste management [1,7] but in some countries, extended duties are also performed. [8]

In 2015 a dental assistant workforce report of the United States was published, showing the demographic and professional characteristics of dental assistants; it also described the regulatory and allowable tasks for dental assistants and examined their potential contributions to the improvement of public oral health. It showed that dental assistants in the United States were predominantly female, with an average age of 35 years. Classifications of allowable duties and tasks under the job title of 'dental assistant' varied by state, with as many as 5 levels and job titles. [9]

Since then, ADA has conducted ongoing surveys of private-practice dentists to learn more about the characteristics of their practices and employees. In 2013, for instance, they found that most (84.4%) dentists in private practice employed chair-side dental assistants and that nearly one-quarter (24.9%) of all private-practice dentists employed expanded function dental assistants. [10]

Despite numerous and scattered studies on the various issues related to the dental team and the duties of each around the world, no comprehensive study has yet been conducted on the training and performance status of dental assistants in Iran. Therefore, in this study, after preparing an acceptable tool on the common duties of dental assistants, their performance was addressed. Moreover, a picture of the educational status of dental assistants in Isfahan as a large city of the country was drawn.

Materials & Methods

The present study was a descriptive-analytical cross-sectional study conducted on dental assistants of Isfahan in 2020. The project was approved by the local ethical committee of Isfahan University of Medical Sciences with the code IR.MUI.RESEARCH.REC.1398.556. During the systematic random sampling, the list of active dentists working in the city of Isfahan was prepared by a regional organization of the medical system. According to the maximum prevalence of 50% for the performance frequency variable, with 5 % type I error and the d parameter of 0.07, the sample size of 196 (215 by 10% drop-out) was calculated. After referring to the relevant addresses, the dental assistants

were invited to the study and the questionnaire was provided to them. The inclusion criteria for enrolling the dental assistants were at least one year of experience working with a general dental practitioner and being willing to cooperate. The questionnaire was developed by the researchers in three parts. The first part included demographic information and the work experience as a dental assistant; the second part included information about the level of education and university degree, dental assisting courses, and its place and time.

The last part of the questionnaire, which was regarding the duties of the dental assistants, was prepared through defined phases. At first, the available resources of the common tasks as duties of chair-side dental assistants in local and international documents were explored. The draft of the item, which was intended to pool statements with 17 items to check the content and face validity, was delivered to the expert panel (8 dentists with experience in clinical work, including 4 faculty and 4 non-faculty members). They were asked to rate each statement according to the following: "Necessary proposition": 3, "Useful but unnecessary proposition": 1, and "Unnecessary and useless proposition": 0 In addition, the experts were asked to indicate if they had any specific comments or suggestions on any of the items.

After collecting the opinions, the content validity ratio for each item was calculated with the relevant formula, which was required for an 8-person panel of at least 0.75. The CVI of the revised questionnaire with 13 items was calculated by the mean remaining items' CVR as to be 0.769. To check the reliability and evaluate face validity, the pilot study was performed randomly in a number equal to 10% of the sample size (20 people); then the reliability coefficient was calculated through Guttman split-half analysis. The reliability coefficient was 0.68 for the performance and 0.64 for the ability scores. [11]

Assistants were asked to evaluate themselves in regard to doing the tasks in each statement on a scale of 1 to 3 (I do not do at all: 1, sometimes I do: 2, and I always do: 3). Moreover, they were asked to rate themselves in terms of their self-ability to do each of the statements based on a score between 0 and 20. Then, the mean self-rated scores of dental assistants' tasks and their relationship with such factors as education degree, level of experience, gender, age and the related course passed were examined. For the analysis, the variable of work experience was dichotomized into two categories: inexperienced (less than or equal to 5 years) and experienced (more than 5 years). The educational courses were asked as yes/no questions and their duration was considered based on months.

Related task propositions with similar tasks were then grouped into a task dimension placed in one domain; so, 13 propositions were evaluated as 6 domains, as presented in Table 1. The mean score of all propositions was assumed as the self-assessment score in having the ability and performing the tasks. Statistical analysis was performed using SPSS software, version 23. The Mann-Whitney U test was then used to compare the scores based on gender and the course passed and experience groups; the Spearman correlation coefficient was also applied to examine the relationship between the mean of self-assessment scores, age and experience. Descriptive parameters including mean, standard deviation and frequencies were also used.

Results

Demographic findings: By a 93% response rate, 200 persons completed the questionnaires. Of these, 193 were female (97.5%). The mean (±SD) age was 30.48 (6.2) years, between 21 and 48 years. The mean (±SD) work experience was 5.7(4.1) years, between 1 and 20 years. The distribution of the samples was almost equal through different regions of Isfahan. Their training courses are shown in figure1. The period of the readiness course was from 1 to 4 months, and 63% of the participants had passed the dental assistant training course.

The level of education and university field of study were quite diverse among the participants, while 90 (76%) had studied in a non-medical field like accounting, art, psychology, management, computer sciences, economics and so on. The others had higher education in such medical-related fields as nutritional science, genetics and biology. The highest frequency was related to graduation, accounting for 21.19%.

As shown in the participants' educational background in figure 2, most of them (38.5%) have a bachelor's degree.

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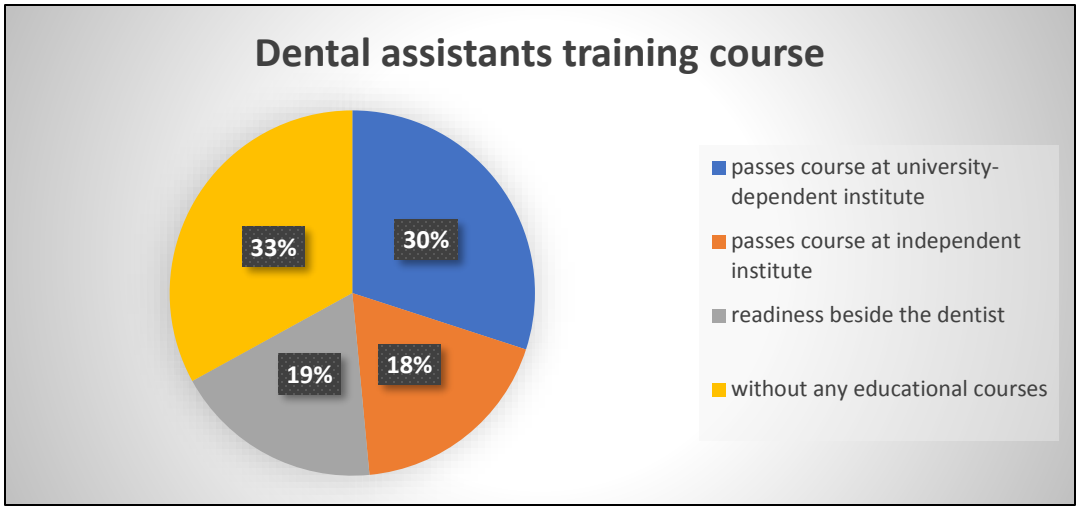


Fig 1. Frequencies of the dental assistants in regard to the status of training or educational courses (n=200)

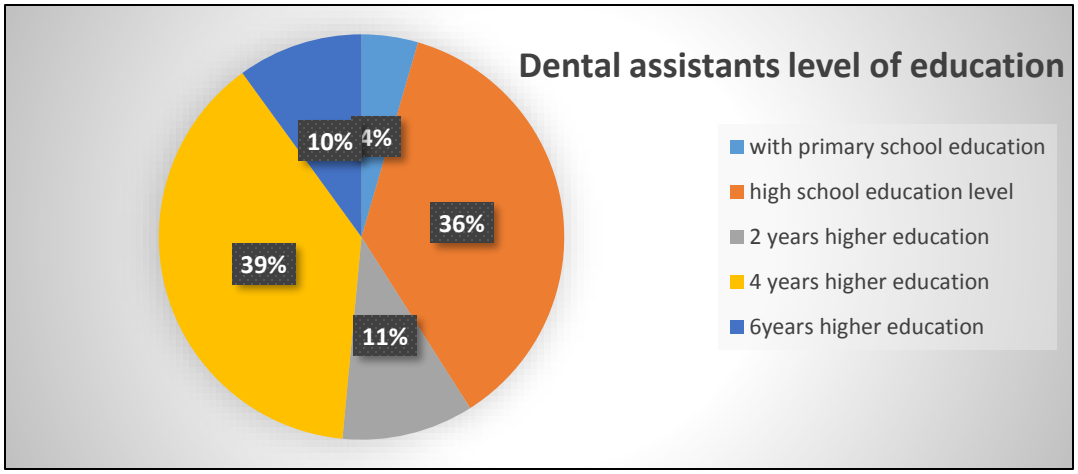


Fig 2. Background levels of education among dental assistants in Isfahan, Iran (n=200)

Duties and tasks status: The mean (±SD) of the total self-reported ability score was 19.09 (6.51), with a range of 17.69 to 20. The highest ability score was related to the field of cooperation with the dentist, with an average of 19.47; meanwhile, the lowest one belonged to health promotion through prevention, which was 17.56. The status of handling the duties by dental assistants is represented in figure 3. The highest performance was in the areas of cooperation with the dentist, infection control and preparation of materials and equipment, respectively; meanwhile, the lowest performance belonged to the promotion of health through prevention. According to the results of the Spearman correlation test, there was no significant relationship between the dental assistants' ability score and age (P_v: 0.011, r: 0.18). Also, the results of the Mann-Whitney test showed that only in the field of radiographs, the ability score of residents was significantly related to the course passed (P_v <0.001) and gender (P_v: 0.010) (Table 1).

Fisher's exact test also showed a significant relationship between doing the tasks and passing the course only in the propositions related to preparing the unit and placing the patient at the right position, being a good listener for the patient and covering the unit and tools for the infection control (P <0.01). In addition, more experienced assistants were significantly better at replacing the covers (P <0.01), disinfecting equipment (P <0.01), preparing the unit and position for the patient (P <0.001), talking to the anxious patient to reduce his/her stress (P <0.05), and actively listening to them (P <0.01).

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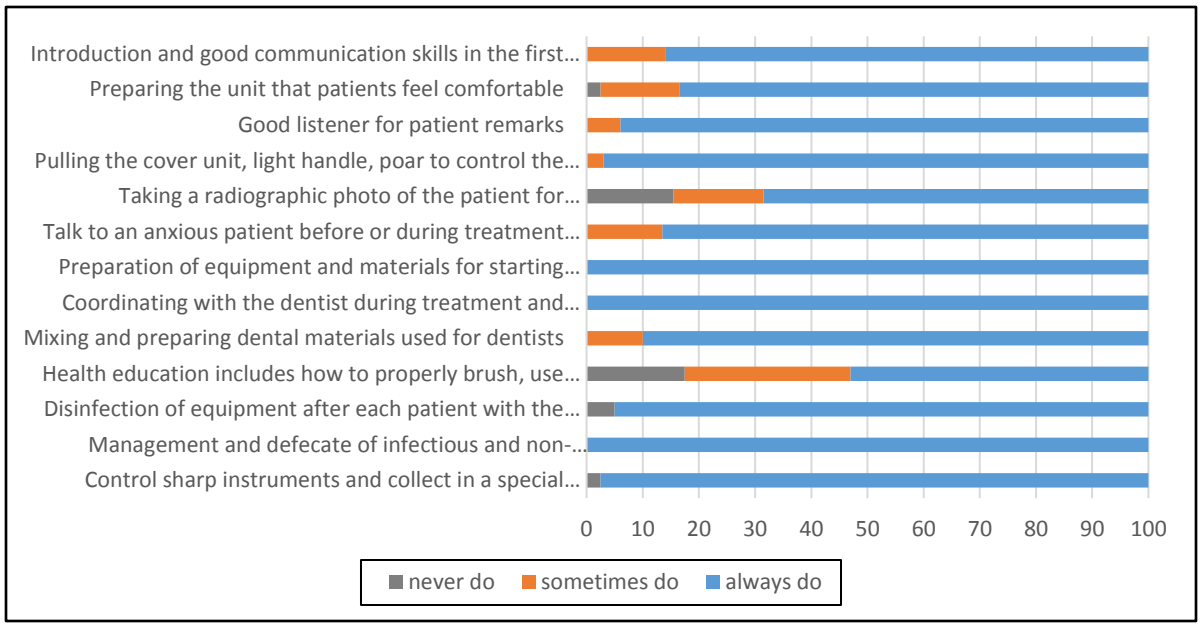


Fig3. The status of doing the tasks among dental assistants, as reported by frequency percent

Table1. Self-reported ability scores in tasks and domains of chair-side dental assistants and relationship between gender and training history in Isfahan, Iran

Domain	Item	Mean±SD	Gender (P)*	Training course (P)*
Communication skills	1.I Introducing and well communicating when dealing with patients 3. Being a good listener for the patient 6.Talking to the anxious patient before or during treatment to reduce his/her stress and anxiety	19.04±0.8	0.97	0.84
Preparation of materials, equipment and tools	2.Preparing the unit and positioning the patient so that he feels comfortable 4. Replacing the cover of the unit and the other equipment 7. Preparing the proper instruments and materials to start the treatment 9. Mixing and preparing the dental materials used for the dentist	19.29±0.57	0.83	0.28
Radiography	5. Taking a radiograph of the patient for diagnosis or during treatment	18.64±2.02	0.01	0.001
Perfect harmony with doctor	8.Cooperating with the patient during treatment and giving him the device	19.47±0.7	0.11	0.051
Promoting health through prevention	10. Giving oral health instructions including proper brushing, flossing, diet and other recommendations	17.56±3.3	0.87	0.29
Waste management Infection control	11.Disinfecting equipment and surfaces for each patient 12. Managing and separating the infectious and non-infectious waste 13. Keeping up the sharp tools and collecting them in a special container	19.42±0.66	0.14	0.06

* Mean score was compared between groups by Mann-Whitney U test.

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Discussion

The analysis of the educational status of the dental assistants in the city of Isfahan, Iran, revealed the diversity and irrelevance of their majors of study and degrees. They had a satisfying ability to do their duties which are determined for this personell on the basis of self-reporting. The best scores were found at the sub-scale of cooperation with dentists. While the lowest one were at the oral health education and taking radiographs.

Since there are currently about 1952 graduates with a dentistry degree in this city, dental assistants could be regarded as a significant professional and scientific resource. Determining the right requirements and directions to attract dental assistants will not only improve the quality of dental care services [12] but can also be effective in reducing unemployment among the graduates of health-related fields

Documents showed that formal dentist assistant training is not much common all around the world. In the USA, for instance, approximately 31% of dental assistants receive some college-level education without obtaining a formal degree. Also, 29 % of dental assistants indicated that a high school diploma was their highest level of educational obtainment. Nearly 25% of dental assistants possessed a 2-year, 4-year, or post-baccalaureate degree. Most states permit dental assistants to be trained on the job by employing dentists who provide in-office training and work experience. Formal education in dental assisting is also offered through vocational programs, community colleges, trade and technical schools, dental schools, and universities. However, CODA should accredit many postsecondary dental assisting education programs. [9,12]

In our study, the tasks as mostly reported included cooperation with the dentist, infection control and equipment preparation. Also, their highest ability score was expressed in regard to cooperation with the dentist. Diverse patient-mix at the office of general practitioners and high repetition of the learned tasks played an important role in increasing the skills and abilities of the dental assistants. It also seemed that assistants were more careful and interested when there was a direct connection with practical and clinical work, rather than theoretical issues.[13,14]

The findings, therefore, showed the lowest ability score in the field of oral health prevention. Oral health education as the basis of prevention is less emphasized in the training courses of the assistants. Moreover, lack of enough knowledge about the importance of prevention and difficult time management could be regarded as some possible reasons. During employment, dentists are not very willing to encourage their assistants to do health education, which could be due to the lack of a separate visit for this job or the inadequate number of assistants; thus, they should handle other tasks and manage patients' admission time. [15]

In some countries, due to the structure of the dental team, some preventive measures like fluoride therapy are taken by intermediate health work-forces in private and public sectors. [16] Given the current situation of the oral health workforce in our country and the absence of dental hygienists, by entrusting this responsibility to assistants and ensuring their adequate training and skills, an effective measure can be taken to promote oral health and prevent oral diseases. It also seems that risk-based and face-to-face health education given to patients is more efficient than virtual and overall education, which could be handled by the assistants.

The findings of this study, therefore, showed that the assistants were not much capable of taking radiographic photos. Since this task includes many cardinal techniques, it is difficult for an assistant to do it without prompt training. Although many dentists may give brief instructions to their assistants, failures are common. In addition, some factors like avoiding contact with mouth and saliva, having a feeling of inability to control the patient, or being concerned about poor image quality may lead to the fear of radiation exposure among some assistants. Due to its adverse effects on the thyroid and infertility, they are not very willing to handle this task. [17] Most of them even do not consider taking radiographs as one of their duties or at least ask for a separate fee for doing it.

This study was designed on the self-assessment of the participants. This would be the main limitation of the finding. It is suggested that the task performance of the dental assistants be investigated from the perspective of the dentist by interview or other observational methods in the future.

Despite some limitations, one of the strengths of this study was the design of the questionnaire tool for dentist assistants based on reviewing evidence and opinions of the local experts, as well as systematic sampling in different areas of Isfahan. However, the evaluation of their efficacies by observation, dentists' reports, the occupational hazards, which were not addressed in this study, are highly recommended for further research.

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Conclusion

Despite the variety of degrees and fields of study, the ability and duties handled by dental assistants were satisfactory. Practical training courses are, however, recommended to increase the ability to take radiographs and promote oral health and prevention. Dental assistants' job definition, the training process and accreditation should be considered in Iran's health system.

Funding

This study was a research project (Grant No: 398618)supported and funded by Isfahan University of Medical Sciences.

Conflicts of Interest

There is no conflict of interest.

Authors' Contribution

Dr. Imaneh Asgari substantially contributed to the conception and design of the study, analysis and interpretation of data. She supervised the data gathering, too. Dr. Yasin Baghban was involved in data collection and analyzing data by software. Two authors were drafting the manuscript but Dr. Imaneh Asgari finalized the manuscript after several revisions and she would be responsible for appropriate portions of the content of the submitted one. Two authors agreed to be accountable for all aspects of the work.

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