

Dentist's Perception of Training and Service Provision in Restorative Dentistry in Riyadh

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Abstract

New drug development is a highly regulated and complex process that involves the pharmaceutical industry, academic institutions, and government agencies' collaborative work. In pre-clinical testing, statistics indicate that out of 5000 compounds only five enter and evaluated in human clinical trials, moreover, only one drug is approved for human use. The whole process of drug development takes around \$2-2.5 billion and a time of 12-15 years to complete. Around 50 % of investigational compounds fail during the development phase of clinical trials. Despite numerous scientific, technological advancements in research and development, many clinical trials fail to develop new, safe, and effective drugs. Approximately 70% of clinical trials fail in phase 2 whereas; the failure rate of confirmatory trials (phase 3) is around 50%. Tufts center for the study of drug development evaluated the three most common factors behind clinical trial failure- safety, efficacy, and deficient funds. Success-failure of a trial is also associated with other factors like a new molecule, molecular size, and therapeutic efficacy. As drug development involves numerous lives and billions of investments, one failed trial affects the subject's quality of life by physical/social consequences and huge losses to pharmaceutical companies. To reduce the failure rate, many biopharmaceutical companies have opted or established their own more disciplined protocol, portfolio, and progress review frameworks. These strategies reduce the chances of errors during drug development and help in clinical trials' success rate.

Keywords: Clinical trials failure, Drug development, Financial impact, 5R framework

INTRODUCTION

Restorative Dentistry is a diverse topic of dentistry that encompasses a broad range of clinical and diagnostic abilities. In the words of the UK General Dental Committee: "the review, determination and incorporated compelling administration of dental and oral depression infection to meet the useful, mental, and tasteful necessities of the singular patient, including the coordination of multi-experts attempting to accomplish these destinations" It is exceptional to the extent that it is a solitary claim to fame however includes the extent of training of three other perceived fortes some of the time alluded to as the remedial mono-specialties, in particular prosthodontics, endodontics, and periodontology. It makes use of all forms of tooth and tissue reclamation, from periodontal board to endodontic tissues, and tooth substitution (including face hard and sensitive tissues) through fixed bridgework, removable artificial teeth, and Osseo-integrated dental implants [1].

Consultants and experts in restorative dentistry and individuals who provide these services give specialized treatment, guidance, support, education, and training to colleagues in the primary care environment. The range of services they provide varies according to their location and the skill mix of the consultant teams with whom they may operate. Those who work at dental teaching institutes may

establish subspecialties among their team members. However, all Consultants in Restorative Dentistry are trained to a standard that allows them to provide a wide basis of integrated treatment and counseling across disciplines at a fair cost [1, 2].

The appraisal and treatment of infections of the oral cavity, teeth, and the designs that help them is the focal point of therapeutic dentistry. Endodontics, periodontics, and prosthodontics are dental claims to fame in therapeutic dentistry (which incorporates implantology). The establishment is established on how various callings

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How to cite this article: Alkahtani SA, Alsaiari HN, Alqahtani NS, Bakhsh OY, Alqudairi MS, Alwadai AD, et al. Dentist's Perception of Training and Service Provision in Restorative Dentistry in Riyadh. Arch Pharm Pract. 2021;12(2):118-24. <https://doi.org/10.51847/E8f8J11FTk>

interface under the watchful eye of patients who require extensive consideration. The Relationship of Advisors and Experts in Helpful Dentistry makes it a stride further by characterizing clinical therapy, instruction, and investigation into entire dental, medical care for patients, everything being equal, clinical issues, and mental foundations. Restorative dentistry focuses on the repair of the mouth following sickness, genetics, or trauma. The patient needs multidisciplinary collaboration to meet the demands of aesthetic, psychological, and utilitarian needs. It is meant to meet the needs of the user [3, 4].

Medical concerns that prohibit patients from obtaining primary care are high. When therapy is easier, it is common for specialists to work with primary care practitioners to deliver it. There are several clinical issues to deal with in a restorative dentistry department, making patient care difficult. In restorative dentistry, many experts hold regular courses to keep their colleagues up to date on several topics, from treatment planning to competence courses on all elements of the restorative procedure. These abilities are currently only taught on a very infrequent basis "in-house" inside the departments in which the consultants work. Courses with a significant hands-on component, if adequately financed, may be expanded to allow clinicians at all levels to collaborate with specialty trained colleagues to observe, develop and ultimately teach skills that can be applied to their profession [1].

On the other hand, may have both acute and chronic issues that need restorative therapy in neck and head cancer patients. A comprehensive evaluation and any necessary treatment must be given before undergoing formal radiation to avoid unfavorable outcomes. Due to the necessity of cancer treatment, both primary and secondary care providers are under pressure to get patients dentally healthy as quickly as possible. Once formal cancer treatment is over, patients may have difficulty recovering due to significant changes in post-surgery oral architecture, decreased oral opening, and oral physiology alterations following radiation. Most restorative consultants and departments have specific criteria for periodontal, endodontic, and prosthodontic procedures that can be provided as secondary hospital care [5, 6].

The NHS has created National Guidelines for the provision of implants in response to growing demand. Recently, a Restorative Dental Therapy Index has been proposed, which determines the degree of complexity of restorative dental treatment. Although restorative treatment is mechanistic and widely recognized, patient care must also take into account other considerations. As a result, modifying factors have been included in the grading scheme [5, 7].

A few studies have been done on dentists' knowledge and provision in restorative dentistry. A survey was conducted in the UK among dental graduates to assess their knowledge

about training and provision. Among the whole sample, 41 dentists reported that they formally received information about career options in restorative dentistry, while 45 were those who strongly agreed that they understand restorative dentistry as a specialty. 53 of them were confident and fully aware of the difference between restorative dentistry and other dental fields. Their views about case referral or priority cases within restorative dentistry were a mix, and 15 participants hold a view that poor oral hygiene and uncontrollable periodontal cases should be a priority in treatment. From that sample, 98 were those who considered it beneficial to get training from specialist consultants in restorative aimed at general practice and DCT [3, 8].

Another study reports that in consultants of restorative dentistry, 94% thinks that in restorative dentistry all specialist should get training in sedation. Albeit most of SpRs and as of late certificated CRDs thought that all SpRs ought to get preparing in cognizant sedation through a centre course during the remedial dentistry preparing program, a modest number had not gotten or intended to embrace such preparation. Cognizant sedation preparing encounters varied throughout the UK, and SpRs treated a wide scope of meriting patient classes under sedation. It is empowering that numerous SpRs desire to keep utilizing sedation strategies after their therapeutic dentistry preparation has wrapped up. The aftereffects of this overview ought to illuminate every one of those engaged with restorative dentistry preparing programs [9].

Aims of the Research

- To determine the perception among the dentists towards training and service provision in restorative dentistry.
- To compare based on gender and clinical experience of study participants.

MATERIALS AND METHODS

Study Design: This is cross-sectional research carried out among the dentists in Riyadh by an online survey.

Study Sample

Hospitals and clinics in Riyadh were contacted and participants were demanded to fill up the survey.

Study Instrument

Online questionnaire was formed including questions about personal and demographic data followed by questions linked to training and service provision of restorative dentistry.

Instrument Validity and Reliability

A pilot study was performed by sending the survey to 20 participants and the data was entered SPSS version 22 to specify the reliability using Cronbach's coefficient alpha. The validity of the questionnaire was examined by sending it to experienced researchers in REU and changes were made according to their feedback and comments.

Statistical Analysis

The gathered data was analyzed using SPSS version 22, where descriptive as well as inferential statistics were performed. Comparisons between groups will be made with the value of significance kept under 0.05 using the Chi-square test and correlations were done using Spearman's correlation as the data was not normally distributed.

RESULTS AND DISCUSSION

A total number of 113 dental students from both genders participated in the present study and provided their opinion regarding the topic. Most of them were from the age group of 26-30 having 42.5% (**Table 1**). Most of the participants were male (66.4%) (**Figure 1**). Dentists with clinical experience of 2-6 years outnumbered the other participants with 54%, followed by 29.25 of more than 6 years of experience and 16.8% of having clinical experience less than 2 years (**Figure 2**). 67.3% of the participants were those who were currently working or ever worked in secondary care. 60.2% of participants received any formal information for different career pathways, and 50% agreed with the stance that they feel confident in understanding their job role properly.

When asked about preferred cases for treatment, 28.3% of participants thought that patients with a higher number of carious lesions should be preferred, and 21.2% agreed that full mouth reconstruction should be referred along with the case agreed before. 74.3% of the participants believed that getting information about their field via various means would be beneficial, and 81.4% thought getting training from consultants would be beneficial in providing clinical services at a general practice. 82.3% hold a view that pieces of training are beneficial for dentists who want to go further in specializing. 33.6% were those planning for general practice as their current career plans. In **Table 2**, female participants practiced in secondary care than male participants. While getting informed about career pathways, female participants got more formal information about a career than male participants, and in previous research, 41% received formal information. Female participants strongly agreed that they have a better understanding of what is a consultant's job involves. In most preferred cases for treatment, male participants believe that patients with high carious lesions should be preferred, and females second this opinion. On referral concerns, male tooth loss was preferred, while full female mouth reconstruction should be referred for an opinion to a restorative consultant. Male participants consider it beneficial to get information via different sources more than female participants because 81% of male participants said yes while only 61% of females said yes. Training for general dental practice and specializing was good for males, and 80% of males said yes while 875 female participants agreed. Specialization is the current career plan for males. **Table 3** shows the differences across the experience.

Table 1. Descriptive analysis of the data

Variable	Frequency Percentage
Age	
20-25	44(38.9%)
26-30	48(42.5%)
31-35	13(11.5%)
36-40	8(7.1%)
Gender	
Male	75(66.4%)
Female	38(33.6%)
Clinical Experience	
Less than 2 years	19(16.8%)
2-6 years	61(54.0%)
More than 6 years	33(29.2%)
Please state whether you have ever worked in or are currently working in secondary care?	
Yes	76(67.3%)
No	37(32.7%)
Have you ever received any formal information on the various career pathways within restorative dentistry?	
Yes	68(60.2%)
No	45(39.8%)
Please rate how much you agree or disagree with the following statement: 'I feel confident in my understanding of what a restorative consultant's job involves?'	
Strongly agree	34(30.1%)
Agree	50(44.2%)
Neutral	29(25.75)
Disagree	00
Strongly Disagree	00
Please select which types of cases you feel should be prioritized for treatment in a restorative dentistry department?	
Tooth surface loss	26(23%)
Cleft lip/palate	8(7.1%)
Full mouth reconstructions	16(14.2%)
Investigating failing crown and bridgework	5(4.4%)
Implant placement in healthy patients	3(2.7%)
Molar Endodontics	5(4.4%)
Root canal retreatment	00
Patients with a high number of carious lesions	32(28.3%)
Patients with specific medical backgrounds	7(6.2%)
Severe trauma	4(3.5%)
Patients with uncontrolled periodontal disease and poor oral hygiene	3(2.7%)
Patients with failing treatment carried out abroad	4(3.5%)
Please select which types of cases you feel are appropriate for referral for an opinion from a restorative consultant?	
Tooth surface loss	15(13.3%)
Cleft lip/palate	11(9.7%)
Full mouth reconstructions	24(21.2%)
Investigating failing crown and bridgework	6(5.3%)
Implant placement in healthy patients	9(8%)

Molar Endodontics	6(5.3%)
Root canal retreatment	5(4.4%)
Patients with a high number of carious lesions	24(21.2%)
Patients with specific medical backgrounds	3(2.7%)
Severe trauma	3(2.7%)
Patients with uncontrolled periodontal disease and poor oral hygiene	4(3.5%)
Patients with failing treatment carried out abroad	3(2.7%)
Would you see any benefit in receiving further information about restorative dentistry as a specialty and career pathway via courses, conferences, and presentations?	
Yes	84(74.3%)
No	29(25.7%)
Would you see any benefit in receiving teaching from restorative consultants and specialists on treatment planning and providing clinical dentistry aimed at general practice?	
Yes	92(81.4%)
No	21(18.6%)
Do you think that Dental Core Training jobs in restorative dentistry are of benefit to dentists pursuing a career in general dental practice?	
Yes	93(82.3%)
No	20(17.7%)
Do you think that Dental Core Training jobs in restorative dentistry are of benefit to dentists interested in specializing?	
Yes	93(82.3%)
No	20(17.7%)
What are your current career plans?	
General practice	38(33.6%)
Specializing	52(46%)
Developing a special interest	16(14.2%)
Community	5(4.4%)
Leaving dentistry	2(1.8%)

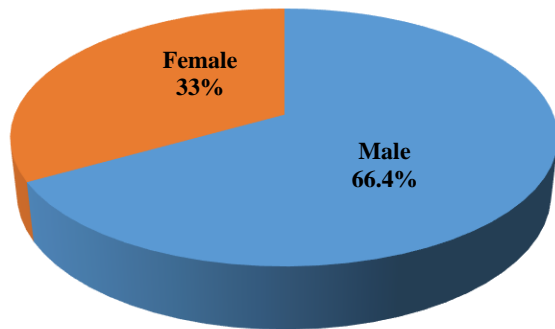


Figure 1. Gender Ratio of Current Study

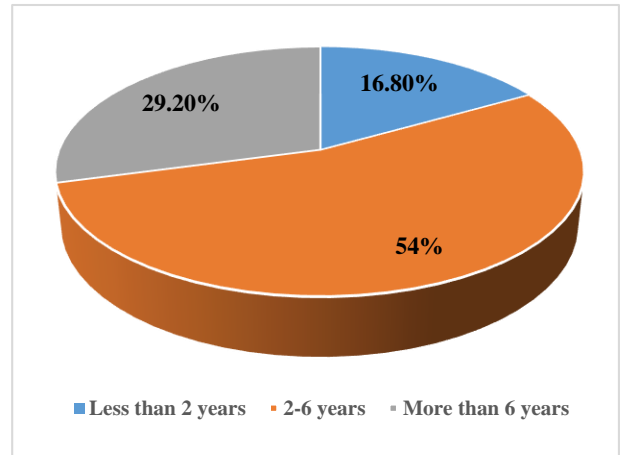


Figure 2. Clinical Experience Ratio of Current Study

Table 2. Comparison on the basis of Gender

Questionnaire Items	Male	Female	P-value
Please state whether you have ever worked in or are currently working in secondary care?			
Yes	61%	79%	.045
No	39%	21%	
Have you ever received any formal information on the various career pathways within restorative dentistry?			
Yes	52%	76%	.013
No	48%	24%	
Please rate how much you agree or disagree with the following statement: 'I feel confident in my understanding of what a restorative consultant's job involves?'			
Strongly agree	28%	34%	.529
Agree	48%	36%	
Neutral	24%	28%	
Disagree	00	00	
Strongly Disagree	00	00	
Please select which types of cases you feel should be prioritized for treatment in a restorative dentistry department?			
Tooth surface loss	22%	23%	.669
Cleft lip/palate	06%	08%	
Full mouth reconstructions	15%	13%	
Investigating failing crown and bridgework	05%	03%	
Implant placement in healthy patients	02%	03%	
Molar Endodontics	05%	03%	
Root canal retreatment	00	00	
Patients with a high number of carious lesions	28%	29%	
Patients with specific medical backgrounds	04%	03%	
Severe trauma	02%	03%	
Patients with uncontrolled periodontal disease and poor oral hygiene	05%	00	
Patients with failing treatment carried out abroad			

Please select which types of cases you feel are appropriate for referral for an opinion from a restorative consultant?			
Tooth surface loss	15%	11%	
Cleft lip/palate	11%	08%	
Full mouth reconstructions	02%	24%	
Investigating failing crown and bridgework	07%	03%	
Implant placement in healthy patients	07%	11%	
Molar Endodontics	08%	16%	
Root canal retreatment	03%	05%	
Patients with a high number of carious lesions	02%	23%	
Patients with specific medical backgrounds	03%	03%	
Severe trauma	05%	00	.200
Patients with uncontrolled periodontal disease and poor oral hygiene	03%	03%	
Patients with failing treatment carried out abroad			
Would you see any benefit in receiving further information about restorative dentistry as a specialty and career pathway via courses, conferences, and presentations?			
Yes	81%	61%	.017
No	19%	39%	
Would you see any benefit in receiving teaching from restorative consultants and specialists on treatment planning and providing clinical dentistry aimed at general practice?			
Yes	85%	74%	.113
No	15%	26%	
Do you think that Dental Core Training jobs in restorative dentistry are of benefit to dentists pursuing a career in general dental practice?			
Yes	80%	87%	.368
No	20%	13%	
Do you think that Dental Core Training jobs in restorative dentistry are of benefit to dentists interested in specializing?			
Yes	83%	81%	.886
No	17%	19%	
What are your current career plans?			
General practice	28%	45%	
Specializing	55%	29%	
Developing a special interest	12%	18%	
Community	04%	13%	
Leaving dentistry	01%	05%	.147

Table 3. Comparison on the basis of Clinical Experience

Questionnaire Items	Less than 2 years	2-6 years	More than 6 years	p-value
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Please state whether you have ever worked in or are currently working in secondary care?				
Yes	16%	50%	34%	
No	9%	62%	19%	.244
Have you ever received any formal information on the various career pathways within restorative dentistry?				
Yes	13%	53%	34%	
No	22%	56%	22%	.275
Please rate how much you agree or disagree with the following statement: 'I feel confident in my understanding of what a restorative consultant's job involves?'				
Strongly agree	21%	44%	35%	
Agree	18%	62%	20%	
Neutral	10%	56%	34%	.295
Disagree	00	00	00	
Strongly Disagree	00	00	00	
Please select which types of cases you feel should be prioritized for treatment in a restorative dentistry department?				
Tooth surface loss				
Cleft lip/palate				
Full mouth reconstructions				
Investigating failing crown and bridgework	08%	54%	38%	
Implant placement in healthy patients	25%	50%	25%	
Molar Endodontics	13%	56%	31%	
Root canal retreatment	20%	40%	40%	
Patients with a high number of carious lesions	34%	33%	33%	
Patients with specific medical backgrounds	20%	40%	40%	
Severe trauma	00	00	00	
Patients with uncontrolled periodontal disease and poor oral hygiene	22%	53%	25%	.888
Patients with failing treatment carried out abroad	00	71%	23%	
	00	75%	25%	
	33%	67%	00	
	50%	50%	00	
Please select which types of cases you feel are appropriate for referral for an opinion from a restorative consultant?				
Tooth surface loss				
Cleft lip/palate				
Full mouth reconstructions				
Investigating failing crown and bridgework	13%	80%	07%	
Implant placement in healthy patients	09%	36%	55%	
Molar Endodontics	16%	50%	38%	
Root canal retreatment	50%	33%	17%	
Patients with a high number of carious lesions	22%	45%	33%	
Patients with specific medical backgrounds	17%	50%	33%	
Severe trauma	00	60%	40%	
Patients with uncontrolled periodontal disease and poor oral hygiene	21%	54%	25%	.319
Patients with failing treatment carried out abroad	00	67%	33%	
	33%	00	67%	
	00	100%	00	

Would you see any benefit in receiving further information about restorative dentistry as a specialty and career pathway via courses, conferences, and presentations?				
Yes	19%	56%	25%	.203
No	11%	48%	41%	
Would you see any benefit in receiving teaching from restorative consultants and specialists on treatment planning and providing clinical dentistry aimed at general practice?				
Yes	20%	53%	27%	.226
No	05%	57%	38%	
Do you think that Dental Core Training jobs in restorative dentistry are of benefit to dentists pursuing a career in general dental practice?				
Yes	18%	54%	28%	.620
No	10%	55%	35%	
Do you think that Dental Core Training jobs in restorative dentistry are of benefit to dentists interested in specializing?				
Yes	20%	40%	20%	.886
No	50%	25%	25%	
What are your current career plans?				
General practice	08%	58%	34%	.085
Specializing	27%	54%	19%	
Developing a special interest	06%	44%	50%	
Community	35%	15%	50%	
Leaving dentistry	10%	30%	40%	

The current study was aimed to investigate the dentist's knowledge about training and provision within restorative dentistry. An online study was carried to reach the targeted population. A total number 113 dental students participated in the present study and provided their opinion regarding the topic. Both genders took part in the present study; research findings were tested to conclude, comparison across gender and clinical experience was carried out through a statistical measure Chi-square after confirmation of instrument's normalcy and dependability with the help of SPSS. First of all, frequency and percentage analysis were done, and results reported that people from different age groups participated in the study. Most of them were from the age group of 26-30 having 42.5%. Most of the participants were male (66.4%). Dentists with clinical experience of 2-6 years outnumbered the other participants with 54%, followed by 29.25 of more than 6 years of experience and 16.8% of having clinical experience less than 2 years. 67.3% of the participants were those who were currently working or ever worked in secondary care. 60.2% of participants received any formal information for different career pathways, and 50% agreed with the stance that they feel confident in understanding their job role properly. When asked about preferred cases for treatment, 28.3% of participants thought that patients with a higher number of carious lesions should be preferred, and 21.2% agreed that full mouth

reconstruction should be referred along with the case agreed before. 74.3% of the sample believed that getting information about their field via various means would be beneficial, and 81.4% that getting training from consultants would be beneficial in providing clinical services at a general practice. 82.3% hold a view that pieces of training are beneficial for dentists who want to go further in specializing. 33.6% were those planning for general practice as their current career plans.

In the analysis, through the Chi-square test, non-significant findings were reported in results when information was tested across gender. Female participants practiced in secondary care than male participants. While getting informed about career pathways, female participants got more formal information about a career than male participants, and in previous research, 41% received formal information. Female participants strongly agreed that they have a better understanding of what is a consultant's job involves. In contrast, 48% of male participants agreed on this, and in previous research reports, almost half of participants agreed that they have a better knowledge of their field [3]. In most preferred cases for treatment, male participants believe that patients with high carious lesions should be preferred, and females second this opinion. On referral concerns, male tooth loss was preferred, while full female mouth reconstruction should be referred for an opinion to a restorative consultant. At the same time, in previous research, participants considered an uncontrolled periodontal disease as the preferred one for treatment and referral [3]. Male participants consider it beneficial to get information via different sources more than female participants because 81% of male participants said yes while only 61% of females said yes. Training for general dental practice and specializing was good for males, and 80% of males said yes while 875 of female participants agreed with yes. Specialization is the current career plan for males. At the same time, for females, general practice is the current career plan and in previously done research, specializing was career planning for almost 44% of participants [3].

While analyzing the information across clinical experience, non-significant differences were reported. Most dentists who ever served in secondary care or currently working there those are having 2 to 6 years of clinical experience. Dentists having experience of 2 to 6 years got more information about different career pathways in dentistry. Dentists agreed that a greater understanding of restorative consultants' job role also falls in the second category, with 2-6 years of clinical experience. Among which 56% are those were having neutral opinions about this topic. Not even a single participant disagreed with that point. In concern with a preferable case for treatment, 75% of dentists with 2-6 years think that severe trauma should be preferred.

Furthermore, while those having experience of fewer than 2 years of more than 6 years thought a preferable case should

be failing patient treatments carried out abroad and tooth surface loss, respectively. The preferable case for a second opinion from consultants was implant placement for those with less than 2 years of experience, tooth surface loss for 2-6 years of experience, and cleft palate for those having experience of more than 6 years. 56% of participants for 2-6 years of experience said yes to get information about career pathways through different means. However, those with 6 years of experience said no to information gathered through different means for different career pathways. It clearly shows that those having experience of 6 years already got settled in their respective field of dentistry. Most dentists with 2-6 years of experience consider it beneficial to get information from a restorative consultant on treatment planning and providing clinical dentistry in general practice. Career plans of dentists with less than 2 years' experience were specializing, and for more than 6 years, it was developing a special interest respectively. So these are the findings drawn from the present research. These findings provide empirical grounds for future research in the field of dentistry and even in getting an overall view about different preferences of dentists.

CONCLUSION

- The overall perception of dentists towards the provision and service related to restorative dentistry was positive and they were interested in improving their competencies.
- Females showed better attitudes towards the training related to restorative procedures, but no significant association was found when compared to the clinical experience.

ACKNOWLEDGMENTS: Authors of this study would like to acknowledge the support and cooperation of the research center of Riyadh Elm University.

CONFLICT OF INTEREST: None

FINANCIAL SUPPORT: None

ETHICS STATEMENT: This study fulfilled all the ethical requirements including data collection and confidentiality of study participants.

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