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Indian Dental Students' Perspectives on Dental Education and Their Future Professional Career: A Cross-Sectional Questionnaire Based Survey

Manumanthu V. Ramesh^{1*}, Puvvadi Gopalakrishna Naveen Kumar¹,
Prashant Gouder Manjunath¹, Sakeenabi Basha¹,
Sushanth Veerabhadriah Hirekalmath¹ and Mohammed Imranulla¹

¹Department of Public Health Dentistry, College of Dental Sciences, Davanagere, Karnataka, India.

Authors' contributions

This work was carried out in collaboration between all authors. Authors MVR and PGNK designed the study and wrote the protocol. Authors PGM and SB supervised the work. Authors SVH and MI carried out all laboratories work and performed the statistical analysis. Author MVR wrote the first draft of the manuscript. Author PGNK managed the literature searches and edited the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Objectives: Investigating career intentions of dental students provides a better understanding of their role in society and contributes to the debate on existing dental education and practice. As an emerging workforce, they have very different professional expectations than those who are already in professional authority and also leading in practice. The objective of this study was to investigate Indian dental students' perceptions on their career decisions after completing a Bachelor of Dental Surgery (BDS).

Methods: A cross-sectional survey was carried out among third year and final year dental students; interns and fresh graduates from two Dental Educational Institutions in Davanagere city, Karnataka, India. A validated close ended questionnaire was administered to 528 subjects.

Results: The response rate was 82.19%. Of the 434 respondents, 40.8% have plans for preparing

*Corresponding author: E-mail: rameshmanumanthu@gmail.com;

for the Post-Graduate entrance exam after their Bachelor degree. Around 51.2% stated future earnings as the most important factor that influences the career choice after BDS. About 55.5% feel that the hands-on experience and overall training provided in the curriculum is not sufficient.

Conclusion: Career related aspirations and intentions varied widely among the participants. Discontent regarding duration of the curriculum, overall training experience and earnings was evident from the study. Policy makers should consider revising the curriculum to tailor the needs of the students so that these obstacles would not affect the provision of oral health care.

Keywords: Dental education; dental students; professional career.

1. INTRODUCTION

The dental education system in India is currently one of the largest in the world. It started with the establishment of the Calcutta Dental College and Hospital in 1924 by Dr. Rafiuddin Ahmed [1]. Prior to 1966, all dental colleges in India were government-aided. In that year, the first dental college in private sector was established. Forecasts of shortages of manpower led to an increase in the number of colleges, especially in the private sector [2]. By 2013, there were 42 government dental colleges and 259 private dental colleges approved by the Dental Council of India producing over 25000 dental graduates every year to serve the oral health needs of the growing population [3].

The World Health Report 2006 defines health workers as all people engaged in actions whose primary intent is to enhance health [4]. This healthcare workforce is an important element of society and a vital resource within healthcare with dentistry being no exception [5]. This essential sector of the workforce is influenced by the wider context including political, societal, and economic change [6].

Investigating the views and professional perspectives of dental students contributes to a better understanding of how they direct their studies during the academic period, plan their career, guide their interpersonal relationships, and determine the role they play in society [7].

Thus, it becomes imperative to understand their opinions and expectations to retain a motivated workforce and also for changing the existing policies in dental education [5]. Also there is a serious lack of authentic and valid data for assessment of students' motivations and attitudes about the field of dentistry in India [8].

Hence in order to shed a light on these aspects, the aim of this study was to assess perspectives on choice of dentistry, dental education,

profession and future career of emerging dental workforce in India.

2. MATERIALS AND METHODS

Davangere is an Indian city in Karnataka state popularly known as the "Heart of the State". It has an urban population of around 435,128. The literacy rate of 84.89% is higher than the national average of 74% [9]. Known for its higher educational institutions, it has 2 dental schools which were accredited by National Assessment and Accreditation Council and recognised by Dental Council of India. Renowned nationally these institutes have produced a vast dental manpower since their inception in 1979 and 1991. Dental students are admitted to pursue a five year Bachelor of Dental Surgery (BDS) course in the colleges based on rank obtained in a national-level entrance test, state level entrance test and management quota. The management quota includes Non-Residential Indians (NRIs) and students of other countries like Malaysia. The study sample included all the year III BDS and year IV BDS, Interns and Fresh graduates from these two dental colleges and was conducted in January 2014. The research protocol was approved by the Ethical Clearance Committee of College of Dental Sciences. The research instrument was a close ended questionnaire adapted from previous studies [5,6,7,8] and modified according to local conditions. Questionnaire validity and reliability were carried out on a representative sample of dental students who were excluded from the main study. Test-retest was used to check the reliability and internal consistency. The results thus obtained were subjected to statistical analysis. Cronbach's alpha value of 0.81 suggested good internal consistency of the questionnaire. The final questionnaire consisted of demographic details of participants and a total of 16 questions of which one was regarding reason for choice of dentistry as a career, four to know perceptions on dental education and three questions to elicit perceptions regarding the dental profession and

eight regarding perspectives on future career options. The questionnaire was distributed among 528 students at the end of their theory classes and in their residences after clearly explaining the purpose of the study to the participants. Participation was voluntary and anonymous. All the participants were given adequate time to complete the questionnaire and encouraged to submit it at the earliest after completion. To maintain confidentiality, the study was conducted in a single-blind manner. The forms were distributed and collected by a fellow student, without revealing the identity of the responder. The results were analysed by the principal investigator.

2.1 Statistical Analysis

The data were manually entered and stored anonymously in electronic format as a Microsoft Excel (2010) file and statistically analysed using Statistical Package for the Social Sciences version 20 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were used to report the responses for selected demographic variables. Pearson's chi square test was used to evaluate differences in the responses in relation to gender, nationality and education level. The level of significance was set at 0.05.

3. RESULTS

3.1 Response Rate and Demography of Participants

The questionnaire was administered to 528 students of which 434 responded accounting to a response rate of 82.19%. Table 1 shows the demographic details of the participants. The proportion of female candidates (56%; n=243) was slightly higher than that of males (44%; n=191). By nationality, 81.33% were Indians (n=353) and 18.67% were Malaysians (n=81). By educational level, the percentage of participants belonging to III BDS, IV BDS, Interns and Fresh graduates were 32.71, 27.88, 24.42, and 14.97 respectively.

The number and percentage of responses among males and females about reason for choice of dentistry as a career, perceptions on dental education, perceptions on dental profession and perceptions on future career are presented in Tables 2, 3, 4 and 5 respectively.

Table 1. Demographic details of study participants

Variable		Number	Percentage
Gender	Male	191	44
	Female	243	56
Nationality	Indian	353	81.33
	Malaysian	81	18.67
Education level	III BDS	142	32.71
	IV BDS	121	27.88
	Interns	106	24.42
	Fresh graduates	65	14.97

3.2 Response Regarding Choice of Dentistry as a Career

38.2% of the participants responded that it was because of the encouragement by their family and friends. This number was higher for females (42.4%) compared to 33% of males. The next reason cited was dentistry being a challenging and interesting career by 28.8% (27.7% males and 29.6% females). 25.7% of males liked the idea of being their own boss compared to 11.5% of females. There was a statistically significant difference in the opinion between males and females ($p=0.002$). No such difference was observed when educational level and nationality were considered.

3.3 Responses Regarding Perceptions on Dental Education

12% of the respondents felt that dentistry was boring and uninteresting. The number was almost double in males (16.2%) when compared to females (8.6%). This feeling was slightly higher in Indians (12.5%) than in Malaysians (9.9%). Majority of the participants (50.8% males and 44.9% females) felt dentistry was good and suits them. 42.8% of females and 27.7% of males considered dentistry interesting and challenging. When analysed statistically, a highly significant difference was observed for gender ($p=0.001$).

44.9% of the participants (48.7% males and 42% females) considered the duration of dental school curriculum too long.

Table 2. Comparison of reason for choice of dentistry as a career between males and females

S. no	Question	Responses	Frequency	Gender		chi-square p-value
				Male	Female	
1	Among the following what do you think is the most important reason for choosing dentistry?	Dentistry offers a stable work and pay	66(15.2%)	26(13.6%)	40(16.5%)	15.211 p = 0.002
		Encouragement of family and friends	166 (38.2%)	63(33.0%)	103(42.4%)	
		I like the idea of being my own boss	77(17.7%)	49(25.7%)	28(11.5%)	
		Dentistry is a challenging and interesting career	125(28.8%)	53(27.7%)	72(29.6%)	

Table 3. Comparison of responses regarding perceptions on dental education between males and females

S. no	Question	Responses	Frequency	Gender		Chi-square p-value
				Males	Females	
1	So far how do you feel dentistry is?	Good and suits me	206(47.5%)	97(50.8%)	109(44.9%)	13.201 p = 0.004
		Boring and uninteresting	52(12.0%)	31(16.2%)	21(8.6%)	
		Interesting and challenging	157(36.2%)	53(27.7%)	104(42.8%)	
		Can't decide	19(4.4%)	10(5.2%)	9(3.7%)	
2	How do you find the duration of the dental school curriculum?	Too long	195(44.9%)	93(48.7%)	102(42%)	1.962 p = 0.580
		Short	54(12.4%)	22(11.5%)	32(13.2%)	
		Reasonable	154(35.5%)	63(33.0%)	91(37.4%)	
		Can't decide	31(7.1%)	13(6.8%)	18(7.4%)	
3	Have you ever had thoughts about leaving dentistry in the last one year	Yes	157(36.2%)	78(40.8%)	79(32.5%)	3.212 p = 0.073
		No	277(63.8%)	113(59.2%)	164(67.5%)	
4	Do you think the hands-on experience and overall training your curriculum provided was adequate?	Yes	83(19.1%)	35(18.3%)	48(19.8%)	1.049 p = 0.592
		No	241(55.5%)	103(53.9%)	138(56.8%)	
		Can't decide	110(25.3%)	53(27.7%)	57(23.5%)	

Table 4. Comparison of responses regarding perceptions on dental profession between males and females

S. no.	Question	Responses	Frequency	Gender		Chi-square p-value
				Males	Females	
1	Do you think your profession gives you a relatively high status in the society?	Yes	326(75.1%)	147(77.0%)	179(73.7)	0.623 p = 0.43
		No	108 (24.9%)	44(23.0%)	64(26.3%)	
2	Do you think you are able to help out people and derive pleasure because of dental profession?	Yes	359(82.7%)	161(84.3%)	198(81.5%)	0.591 p = 0.442
		No	75(17.3%)	30(15.7%)	45(18.5%)	
3	Do you think legislation should be made to fix basic pay scale for a BDS graduate?	Yes	319(73.5%)	143(74.9%)	176(72.4%)	0.327 p = 0.567
		No	115(26.5%)	48(25.1%)	67(27.6%)	

Table 5. Comparison of responses regarding perceptions on future career between males and females

S. no	Question	Responses	Frequency	Gender		Chi-square p-value
				Males	Females	
1	What are your immediate plans after BDS?	Start your own clinic	81(18.7%)	30(15.7%)	51(21.0%)	27.301 p = 0.001
		Associateship under an established dentist	59(13.6%)	28(14.7%)	31(12.8%)	
		Prepare for post graduate entrance exam	177(40.8%)	96(50.3%)	81(33.3%)	
		Go abroad	71(16.4%)	31(16.2%)	40(16.5%)	
		Any other	46(10.6%)	6(3.1%)	40(16.5%)	
2	Among the following, what do you think is the most important factor that influences your career choice after BDS?	Future earnings	222(51.2%)	129(67.5%)	93(38.3%)	45.101 p = 0.000
		Location of settlement	72(16.6%)	17(8.9%)	55(22.6%)	
		Interest toward a particular speciality	122(28.1%)	34(17.8%)	88(36.2%)	
		Expenditure to be met	18(4.1%)	11(5.8%)	7(2.9%)	
3	What kind of dentist you will be in future?	General Dentist	65(15%)	18(9.4%)	47(19.3%)	31.209 p = 0.000
		Researcher	46(10.6%)	18(9.4%)	28(11.5%)	
		Specialist	189(43.5%)	111(58.1%)	78(32.1%)	
		Educator	90(20.7%)	28(14.7%)	62(25.5%)	
		Others	44(10.1%)	16(8.4%)	28(11.5%)	
4	Which among the following do you think influences a person towards pursuing a post-graduate degree?	Professional Status	106(24.4%)	38(19.9%)	68(28.0%)	42.689 p = 0.01
		Definite source of income and assured job	186(42.9%)	59(30.9%)	127(52.3%)	
		Be a consultant to various clinics	66(15.2%)	43(22.5%)	23(9.5%)	
		Any other	76(17.5%)	51(26.7%)	25(10.3%)	
5	Which among the different branches of dentistry, would you prefer for Post-graduation?	Oral medicine	13(3%)	7(3.7%)	6(2.5%)	p = 0.001
		Oral Pathology	7(1.6%)	1(0.5%)	6(2.5%)	
		Oral Surgery	62(14.3%)	44(23.0%)	18(7.4%)	
		Pedodontics	51(11.8%)	18(9.4%)	33(13.6%)	
		Conservative & Endodontics	149(34.3%)	43(22.5%)	106(43.6%)	
		Prosthodontics	31(7.1%)	22(11.5%)	9(3.7%)	
		Periodontics	22(5.1%)	3(1.6%)	19(7.8%)	
		Public Health Dentistry	19(4.4%)	8(4.2%)	11(4.5%)	
6	If given an opportunity, would work in a country other than your country?	Yes	246(56.7%)	103(53.9%)	143(58.8%)	1.157 p = 0.561
		No	126(29.0%)	60(31.4%)	66(27.2%)	
		Undecided	62(14.3%)	28(14.7%)	34(14.0%)	
7	Do you know about the career avenues in Public sector-PSC and Army Dental Corps?	Yes	160(36.9%)	87(45.5%)	73(30.0%)	11.051 p = 0.001
		No	274(63.1%)	104(54.5%)	170(70.0%)	
8	Do you know that Hospital firms, software companies employ BDS Graduates?	Yes	128(29.5%)	55(28.8%)	73(30.0%)	0.080 p = 0.778
		No	306(70.5%)	136(71.2%)	170(70.0%)	

During the last one year, 36.2% of the participants had thoughts about leaving dentistry at least once. A majority of them were male participants (40.8%).

55.5% of the total participants had an opinion that the hands-on experience and overall training provided in the curriculum was inadequate. This discontent was highest among fresh graduates (64.6%). Surprisingly a substantial portion (25.3%) of the participants couldn't decide upon this.

3.4 Responses Regarding Perceptions on Dental Profession

75.1% of the participants felt that dental profession gives them relatively high status in the society. This belief was higher among Malaysians (81.5%) when compared with Indians (73.7%) although there was no statistical difference.

82.7% of the respondents were able to help out people and derive pleasure from the profession.

73.5% of the respondents felt that there was a need for legislation to fix basic pay scale for a BDS graduate. This opinion was uniform among males and females.

3.5 Responses Regarding Perceptions on Future Career

Regarding immediate plans after BDS, 18.7% of the participants had plans to work as an associate under an established dentist. Surprisingly, the percentage of individuals willing to start their own clinic immediately after graduation was higher in females (21%) compared to males (15.7%) in our study. The percentage of males (50.3%) planning to prepare for post-graduation were higher than the females (33.3%) showing a statistically significant difference ($p=0.001$).

When asked about the most important factor that influences career choice after BDS, 67.5% of the males and 38.3% females opted for future earnings. 36.2% of the female participants felt that it was interest towards a particular speciality. This difference was statistically significant for gender ($p=0.000$).

Nearly half of III and IV BDS students want to specialize in the future. This number was higher than interns and fresh graduates (34% and 24.6% respectively). The percentage of males

(58.1%) willing to specialize was higher than the females (32.1%). This difference was significant statistically ($p=0.000$). The number of respondents who wanted to become educators was highest among fresh graduates (30.8%) when compared with others and this difference was highly significant ($p=0.000$).

52.3% of the females and 30.9% of males considered that definite source of income and assured job as the main influencing factor to pursue MDS degree. There was a significant difference with gender ($p=0.01$).

For a question regarding the branch of dentistry that has maximum scope in future, most of the female participants felt that it was Conservative and Endodontics (43.6%) followed by Orthodontics (14.4%) and Pedodontics (13.6%) whereas for male participants it was Orthodontics (23.6%) followed by Oral Surgery (23.0%) and Conservative and Endodontics (22.5%). There was a statistically significant difference in opinion between males and females ($p=0.001$).

56.7% of the participants were willing to work abroad. About 14.3% of the respondents couldn't decide upon this.

45.5% of male participants were aware of career avenues in Public sector like Public Service Commission and Army Dental Corps whereas 70.0% of the female patients weren't, showing a statistical difference ($p=0.001$).

Only 29.5% of respondents knew that hospital consulting firms and Medical software companies also employ BDS Graduates as consultants and medical transcriptionists. This knowledge was highest amongst the fresh graduates (43.1%) when compared with others showing a statistical significant difference ($p=0.01$).

4. DISCUSSION

The response rate in the present study was 82.19%. Similar studies worldwide had a response rate of 70-90% [5,6,7,8]. The number of females in the study was higher than males. This trend was already evident in Canada, Brazil and Yemen [10,11,12]. The reason for higher females in the study is due to more girls opting for health care as they consider this profession would serve for their qualification needs [8].

Understanding the factors that lead to the choice of career is important because that decision

establishes expectations for one's future and may affect one's satisfaction with the career [13]. The choice of career is a critical decision because it has an obvious impact on the individuals' future life pattern [14]. 38.24% of our participants were influenced by their family and friends for choosing dentistry as a career. This finding was consistent with other studies done in India [8] and worldwide [12]. In Indian scenario, high level of involvement of parents would be mainly to facilitate a better quality of life for their children. On the flip side, high level of involvement could easily lead to stress [15,16].

Assessing the level of satisfaction among dental students provides a key barometer of the future of dental education in any country [17]. 40.8% of the male participants had thoughts to leave dentistry in the last one year. 12% of the participants regarded dentistry a boring career. As high proportions of the participants have chosen dentistry by the influence of their family and friends and not by themselves, a handful of them might have considered it boring. Nearly 45% of the participants felt that the dental curriculum was too long. This number was much higher than in Yemeni dental students (22.7%) and slightly less than reported by Chinese students (48%) by Xu Yan [12,18]. However shortening the course duration would not allow the requirements of the curriculum to be fulfilled.

More than half of the respondents felt that the hands-on experience and overall training provided in the curriculum was inadequate. This number was particularly high among fresh graduates. It was reported that dental students in India are trained to excel theoretically, but there seems to be a problem between what is learned and what is applied in the clinics [19]. This could prevent a majority of them from practising immediately after graduation. Prevalence of such discontent is threatening for the profession as it can lead to wastage of valuable resources. If the field of dentistry does not meet the expectations of the prospective workforce, they do not practice with optimum enthusiasm and operational efficiency depleting the pool of already scarce health providers [13]. Inadequate orientation and practice based knowledge makes many graduates uncertain and indistinct in the real professional world. As fresh graduates are the first to enter the world outside the college, they will face the heat of competition and start thinking of income, quality practise which worries them. Revising the curriculum with improved

opportunities for clinical learning could serve as a solution.

Nearly half of the participants had immediate plans to prepare for post-graduate entrance exam after graduation. This also reflected in a question where 42.9% of the participants opted to specialize anticipating a definite source of income and an assured job. Similar findings were reported in another study by Aggarwal et al. [8] though the number of students who wanted to specialize was higher. In contrast, students from Japan did not want to specialize [20]. This could be because they receive more sophisticated and intense clinical training than in India [21]. 43% of the participants considered pursuing postgraduate education for the sake of a definite source of income and assured job. In the present scenario almost 5000 people are qualifying with a post-graduate qualification in dentistry from around 300 colleges every year [3]. With this thumping output and uprising stagnation, availability of new job opportunities would be difficult in the years yet to come [19]. Though people who are engaged in research work are highly regarded in the society, only a few participants want to enter into research. Lack of adequate facilities could be a reason for this. ⁽²⁾ The development of new treatment modalities and new ways to prevent diseases in people at risk of developing them can only result from health research. So it is crucial to promote active health research.

Majority of the participants have considered future earnings as the most important factor which influences career decisions after BDS. This was in agreement with previous studies reported in the literature [22,14]. Making career choices exclusively on monetary perceptions could be detrimental as such professionals tend to work for fringe financial benefits in the future. This trend could be disturbing in a country like India. So principles of ethics and moral values should be stressed upon and inculcated during the academic sessions with reinforcement at regular intervals. Majority of the graduates wanted to go abroad in our study. This could be because of monetary benefits and greater scope for professional growth [2,8].

Conservative dentistry and Endodontics followed by Orthodontics were the most preferred branches by the students. Comparatively a very low number of graduates preferred Oral Medicine, Oral Pathology, Public Health Dentistry and Periodontics. This trend is disturbing as it

may result in a serious deficit of manpower in these fields in the future. Measures by these professional bodies are needed to make these subjects more attractive to address the problem.

About 73.5% of the study participants said that there is a need for legislation to fix basic pay scale for a BDS graduate. These results reflect the views of most graduates who end up in private jobs or associateships after graduating. Only a few might be able to draw good wages, but majority of them end upon getting imperceptible amounts leading to dissatisfaction and discontent. This wouldn't be a problem in government sector as basic pay scales are fixed, regularised and timely increments are provided. This dire need among fresh graduates should be considered seriously by passing a legislature for uniformity of wages.

Though high proportions of females are pursuing dentistry, majority of them were ignorant about various opportunities in public sector. This could be because both female graduates and their parents would consider public sector jobs as transferrable and interfere with their family lives. 70.5% of the participants were not aware of career options in private sector. These results suggest a need for career oriented guidance programs for the dental graduates to create awareness and inculcate interest.

4.1 Strengths and Limitations of the Study

To our knowledge, this is the first study to explore the views of dental students and fresh graduates according to gender and years in India. This study contributes to literature on perspectives regarding the dental education and career aspirations. Students from different parts of the country were pursuing dental education in the two dental colleges where the data was collected and they were part of the study. Generalization of the results to a larger population can be made due to representativeness of the sample and high response rate obtained. The cross-sectional nature of the study did not allow us to find if this career related intentions would vary over time. Also by the close-ended nature of questionnaire, we could have missed other factors that might influence career aspirations.

5. CONCLUSION

From the results of the study, career perspectives and perceptions differed

significantly between male and female dental students. The findings of our study raise important issues about the students' professional career intentions. Discontent regarding length of curriculum, lack of independence in choosing career, inadequate clinical experience and low pay scales were reported. Anticipation of high income and assured job were described as the main reasons for specialization. Inclination towards working abroad and lack of adequate knowledge regarding various career options available within the country were also observed. It is important to consider whether these aspirations would affect the provision of oral health care in future. There is also a need for improvements in dental curricula to build an effective and responsive dental workforce. More studies are therefore needed in this direction all over the country for further evaluation and strengthening of the dental workforce to cater the growing public health needs.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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