

Preparedness of dental under-graduate students towards practicing endodontics in rural and remote areas of India

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ABSTRACT

Background: Undergraduate students can provide valuable opinions and suggestions for modifying the educational program for the enhancement of learning. Therefore, the aim of this study was to explore the preparedness of undergraduate dental students with regard to practice endodontics in the rural and remote areas of India. **Materials and Methods:** The present cross-sectional questionnaire-based study was conducted among dental undergraduates (interns). The survey was conducted among the students of 3 private dental colleges. For the data collection, a close-ended questionnaire was designed to test the knowledge for performing endodontic therapy, root canal therapy (RCT), attitude, and behavior of performing these procedures in the rural set-ups. Unpaired *t* test and one way analysis of variance (ANOVA) was used to compare the significant difference based on demographics and Pearson's correlation was applied to find the associations among knowledge, attitude, and behavior of study participants. The level of significance was set at below 0.05. **Results:** A total of 79 students participated, out of which 22 respondents were males (27.8%), and 57 were females (72.15%). Overall mean knowledge scores for endodontics was 9.72 ± 2.19 , and the scores of female students were slightly higher than males, whereas the attitude and behavior were better in males but there was no statistical significant difference between both the genders ($P > 0.05$). A statistically significant positive correlation was observed between attitude and behavior on practicing endodontics in rural settings among study subjects ($P < 0.05$). **Conclusion:** These findings highlights the necessity for taking initiatives to enhance the community-based dental education programs by various dental colleges for improving oral health care access for rural and isolated populations.

Keywords: Interns, rural dentistry, RCTs

Introduction

There is a vast inequity in the availability of dental services and access to oral health care still remains a far-off dream for lots

of people, especially in rural and remote areas who constitute around 68.8% of the country's population. Policy makers and more crucially community itself do not acknowledge oral health as a priority. This situation is an irony for a country like India, which surpasses in the number of dental institutions and dental graduates than that of the all of Europe, USA, and Brazil. It is shocking to accept that in a nation where 30,570 dentists pass out every year, hardly 10% of dentists provide services in the rural localities.^[1]

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This constant scarcity of dentists and allied dental professionals in rural, remote, and marginalized communities might have a negative effect on the quality of care provided to these communities and thus pose as an unrelenting challenge to health care systems.^[2]

The mushrooming of the dental colleges in India with inadequate student: teacher ratio^[3] and the lack of sufficient infrastructure and facilities has resulted in deficient practical training for students. Often, students are not appropriately trained in private colleges due to the shortage of the required clinical exposure.^[4]

Studies have suggested that relatively less number of dental graduates are qualifying with self-confidence to deal with cases related to oral surgery, endodontics, and prosthodontics, which are considered as technically demanding dentistry.^[5] One of the most technically challenging procedures are identified in endodontics in general dental practice. Furthermore, clinical results seen in hospital settings (secondary care) is possibly not necessarily attained in private practice (primary care)^[5] The reasons for this could be due to the limited obligatory knowledge and skills imparted during their undergraduate curriculum.^[6]

Literature search shows that researches have been conducted for exploring the factors that hinder the withholding of dental care providers in rural and remote areas^[7] and how dental students perceive working in such an environment.^[8] For understanding the challenges that the future dentist may stumble upon while choosing the location and type of services offered in their dental practice, the insights of dental students are essential.^[9,10] Undergraduate students can provide valuable opinions and suggestions for modifying the educational program for the enhancement of learning.^[11] As per our knowledge no study have been conducted with view of the students practice particularly in terms of endodontics in the rural settings. Therefore, the purpose of this study was to understand the preparedness of undergraduate dental students with regard to practice endodontics in rural and remote areas of India.

Material and Methods

This cross-sectional questionnaire study was conducted from 1st September 2019 to 15th December 2019. The ethical clearance was acquired from the Ethical Committee of the Banaras Hindu University on 07/08/2019. The study purpose was informed to the head of the institutions and study participants and written consent was taken from each student. It was specified participation was entirely voluntary and this would not affect in their academic rank. The confidentiality and anonymity of the students was ensured.

Data collection was conducted from dental undergraduates (interns) students from 3 private dental colleges. Inclusion criteria were students who have completed postings in the Department of Conservative and Endodontics as well as in rural postings.^[12] The study proforma comprised of informed consent and details of

demographics and questionnaire, which was self-administered and closed-ended. The sources of theory, observation, expert opinion, and previous researches were employed for generation of items for the questionnaire.^[3,11,13-15] A total of 16 questions focused on principles and steps in endodontic therapy like number of canals in maxillary molars, ideal way to dry root canal were asked for assessing the knowledge of dental students. The correct answers were given score of 1 and wrong were scored as 0 and range varied from 0–16.

Attitude was evaluated for the problems and perceived barriers as well as perceived enablers for practicing endodontics in rural areas. Items were asked on 5 point like rating scale ranging from strongly agree to strongly disagree. The barriers were negatively scored with strongly agree as 1 and strongly disagree as 5, whereas enablers were scored positively with strongly agree scored as 5 and strongly disagree scored as 1. Thus, a higher score depicts positive attitude and lower score portrays the poor attitude of dental students. The few barriers of the items are feel less confident in performing RCT in rural set-up, lack of infrastructure and resources is the main barrier for taking endodontic practice in rural locations, unavailability of good instruments stop you from performing RCTs in rural areas, unaffordability or unawareness of the rural population for not taking RCTs; perceived enablers are to act as motivation to take up RCTs in rural areas like working free hand and like a private set-up, the realization of emphasis role of rural dentists to enhance access to care for the people in rural area.

Behavior of endodontic practice in rural areas was measured using questions like How often you - experience complication in standard RCT procedure, patient's postoperative complaints, performed extraction when RCT was possible, try to explain the pros and cons of RCT versus extraction to the patient, follow the proper standard protocol even in rural settings, etc., The responses were again on 5 point like rating scale and varied from always to never (8–40). The negative behavior questions were scored in reverse order with always given a score of 1 and never given a score of 5 and vice-versa was done for positive behavior questions (8–40). Students were assembled in the lecture hall of the respective institutes and questionnaire were distributed and collected back after one hour.

The questionnaire was checked on 20 study subjects, before the start of the study. The subsequent revisions were made to the questions prior to the main study for the better understanding of subjects. The final version of the questionnaire had the Cronbach's alpha and split-half reliability values for knowledge as 0.78 and 0.74; for attitude were 0.82 and 0.86; and for behavior were 0.82 and 0.80 respectively. Only reliability and validity was calculated and the findings of the pilot study were not incorporated in the main survey. The pilot study students were not involved in the main study.

The data was first entered into the MS Excel (MS Office version 2007 developed by Microsoft, Redmond, WA) and then

analyzed using statistical software SPSS Version 20. Descriptive statistics were done by calculating frequencies, mean, and standard deviations (SD). Unpaired *t* test and one way ANOVA were used to test for the significance of associations with demographics where relevant. To determine associations among knowledge, attitude, and behavior of study participants Pearson's correlation analysis was applied. The level of significance was kept at below 0.05.

Results

A total of 79 dental interns fulfilled the inclusion criteria and all agreed to participate in study. Out of 79, a total of 22 respondents were males (27.8%), and 57 were females (72.15%) [Table 1].

The overall mean knowledge, attitude, and behavior (KAB) scores of students were 9.72 ± 2.19 , 26.34 ± 1.56 , and 25.93 ± 1.30 , respectively. The knowledge scores of female students were slightly higher (10.18 ± 1.36) than males (9.26 ± 3.09), whereas the attitude and behavior scores were better in males. However, no statistical significant difference was found for all the three variables among both genders. A statistical significant difference for knowledge and attitude scores were observed between the age distribution ($P < 0.05$) [Table 2].

Correlation analysis revealed that there was a statistically significant association between attitude and behavior on practicing endodontics in rural settings among study subjects ($r = 0.451$, $P = 0.028$) [Table 3].

Discussion

Unqualified and under-confident students find it difficult to perform technically challenging dentistry such as endodontics. Learning endodontics is found to be complicated, difficult, and stressful by a lot of dental students for the reason that there are diverse anatomies of the teeth and root canals, their accountability to the patient, and little self-confidence. And when these students get posted in rural set-ups as a part of their curriculum practicing such dentistry with "moderate complexity"^[14] is usually not preferred by them. This in turn affects the quality of services provided to the rural under-privileged population. Thus, the present study was taken to assess the knowledge, perceived barriers or interest, and their behavior for practicing endodontics in the rural localities.

Our results showed the overall mean knowledge scores for endodontics was 9.72 (out of 16), which was not adequate. These interns had already finished theoretical exams and clinic postings and can be considered to move out into the real world and practice. Such scores question the competency of the students and concerns with regard to quality of education offered by private dental colleges.^[4]

In our results although the knowledge was slightly higher in females the attitude was found less as compared to males. This was in accord to the study conducted by Ghotane *et al.* to explore

Table 1: Demographic distribution of the study population

Demographic variables		n	Percentage
Gender	Male	22	27.85
	Female	57	72.15
Age	22-24	42	53.16
	25-27	28	34.18
	> 27 years	09	11.39

Table 2: Comparison of knowledge, attitude and practices of study participants based on demographic variables

Demographic variables	Knowledge		Attitude		Practices		
	Mean	SD	Mean	SD	Mean	SD	
Gender	Male	9.26	3.09	26.76	1.09	6.11	1.20
	Female	10.18	1.36	25.82	2.03	5.75	1.41
	<i>P</i> (unpaired <i>t</i> test)	0.647		0.531		0.552	
Age	22-24	10.19	2.94	27.19	0.97	6.54	1.28
	25-27	10.14	1.73	26.68	1.62	5.92	0.99
	> 27 years	8.83	1.81	25.16	2.11	5.34	1.64
	<i>P</i> (One way ANOVA)	0.04*		0.03*		0.054	
Total		9.72	2.19	26.34	1.56	5.93	1.30

* $P < 0.05$; significant

Table 3: Correlation analysis of knowledge, attitude and behavior among study subjects by using Pearson correlation

	Knowledge		Attitude	
	<i>r</i>	<i>P</i>	<i>r</i>	<i>P</i>
Knowledge	-	-	-	-
Attitude	0.065	0.421	-	-
Behavior	0.142	0.179	0.451	0.028*

*Correlation is significant at the level < 0.05 (2 tailed)

views of primary dental care dentists with a special interest in endodontics.^[17]

With respect to age the low levels of all three variables i.e. knowledge, attitude, and behavior were found in interns belonging to older age group. The reason for this could be that these are the interns who take more than usual time to complete their final BDS and belong to slow learners categories.^[18] Efforts must be taken for such learners at the level of internship also, so that they can practice regular dentistry as well as dentistry with moderately complex procedures with interest in college as well as rural set-ups.

Most of the students perceived the lack of proper instruments and ambience and lack of confidence as a major barrier to practice endodontics in rural centers. The findings of Sharifian N *et al.*^[3] also revealed the lack of professional confidence and the absence of previous working experience constitute as major barriers to establishing a rural dental practice. The Lack of resources for practicing endodontics at primary dental care level was also reported by Eliyas S *et al.*^[19]

These findings highlights the necessity for taking the initiatives to enhance the community-based dental education programs

by various dental colleges for improving oral health access for rural and isolated populations. The rural population targeted program facilitates students to understand the implication of their role in alleviating health disparities of under-privileged societies and augment their sense of professionalism and societal responsibility. These experiences to rural dental practice allow the first-hand community exposures for the students.

Limitations

It is important to view the findings of this study with its limitations. The data was collected from 3 dental colleges and thus results cannot be generalized. The inbuilt restrictions of questionnaire and cross-sectional surveys should also be considered to draw the conclusions.

Conclusion

In the present study the female participants were more as compared to males. It was observed that among females knowledge regarding preparedness of undergraduate students regarding practice of endodontics was slightly higher than males, but attitude and behavior was better among males. The attitude and behavior towards practicing endodontics in rural and remote areas was statistically significant in the present study. These findings provide insight into dental interns experience with rural dentistry practices. Expanding the dental graduate's skills and competency could possibly help in regaining the decreasing professionalism of dentistry, which in turn could contribute to quality patient care and superior dental care system. Exploring the chief technical hitches of undergraduate students while performing endodontic treatment may aid in planning better teaching strategies all throughout the endodontics education course.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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