

Should South Africa train specialist endodontists? A cross-sectional online survey

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Abstract

Introduction: Endodontics as an independent dental specialty exists in many regions worldwide, with training programs established in both developed and developing countries. Endodontic specialty training is, however, currently not available in South Africa. This study aimed to determine whether private dental practitioners, who perform clinical endodontic treatment, believed that South Africa should train specialist endodontists.

Materials and Methods: A cross-sectional, observational study was conducted. An online program was used to generate a survey which was electronically mailed to 3252 South African private dental practitioners. Quantitative and qualitative questions with open-ended responses were used. Topics included the following: demographic information, management/referral strategies regarding difficult endodontic cases, and need for endodontics as an independent dental specialty in South Africa. Data were analyzed using simple descriptive methods.

Results: A total of 215 ($n = 215/3252$) responses were received by the closing date. The overall response rate was 7%. The valid responses of 193 participants were included ($n = 193/215$). The majority (83%, $n = 160/193$) of the respondents indicated the opinion that South Africa should train specialist endodontists. The reasons for this opinion were varied. Strategies in place for the management of difficult endodontic cases and existing endodontic referral pathways were additionally identified.

Conclusion: There is a need to train specialist endodontists in South Africa.

Keywords: Dental education, dental referral, dental specialty, endodontics, postgraduate training

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INTRODUCTION


Endodontics is recognized as an independent dental specialty in many regions worldwide, with specialty training programs taught in both developed and developing countries.^[1-3] Endodontic specialty training is, however, not

available in South Africa nor is endodontics recognized as a dental specialty. Accordingly, practitioners holding specialist qualifications from other countries are not able to register and practice as endodontists. In South Africa, nonsurgical root canal treatment and retreatment is routinely performed

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either by general dental practitioners (GDPs), specialist prosthodontists (SPs), or general dentists who hold an additional endodontic qualification such as a postgraduate diploma or MSc in endodontics (PD) and registered as general dentists with the Health Professions Council of South Africa.^[4] Endodontic surgery is performed by either GDPs, PDs, specialist periodontists, or oral and maxillofacial surgeons. Prosthodontics is, therefore, the only South African dental specialty involved in the provision of nonsurgical endodontic treatment.

In 2006, the European Society of Endodontology (ESE) published treatment guidelines containing information related to good clinical endodontic practice. These guidelines state that endodontic cases “beyond the means of individual practitioners” should be referred to a colleague who has completed specialty training in endodontics or has acquired the necessary expertise elsewhere.^[5] The ESE defines endodontology as a distinctive branch of dentistry with no overlap with other medical and dental specialties.^[5]

It has been previously reported that endodontic specialists demonstrate higher success rates and better treatment outcomes when performing nonsurgical root canal treatment as compared to GDPs.^[6] Clinical decision-making, in general, has also been shown to differ significantly between GDPs and specialists.^[7]

GDPs commonly refer patients to specialist endodontists to complete complicated endodontic cases where root canal obstructions, file fractures, perforations, open apices, or root resorption exist. Endodontists also commonly receive referrals from GDPs for the completion of nonsurgical endodontic retreatment and surgery.^[8,9]

In 2006, Naidoo conducted a survey on endodontics in South Africa related to the attitudes, techniques, and materials used by GDPs.^[10] No information regarding the need to train endodontic specialists was obtained in his study. In addition, no published data regarding the attitudes toward promoting endodontics as a dental specialty in South Africa by local GDPs, SPs, and PDs could be found. This study, therefore, aimed to determine whether private dental practitioners, who routinely perform clinical endodontic treatment, believed that a need exists to train specialist endodontists in South Africa.

MATERIALS AND METHODS

The study was approved by the Faculty of Health Sciences Research Ethics Committee, University of Pretoria (Protocol number: 331/2018).

An online platform (Qualtrics, Provo, UT, USA) was used to create a multiple-choice and multiple-response questionnaire [Table 1]. The questionnaire was electronically mailed to 3252 South African private dental practitioners. The target group included 3191 GDPs registered on the database of the South African Dental Association (SADA) and 61 members of the Academy of Prosthodontics, South Africa. The majority of the private GDPs and SPs in South Africa work in either independent solo or small group practices, located in both urban and rural settings. Practice owners often employ other dentists in locum tenens or associate dentist positions.

The inclusion criteria were GDPs and SPs performing clinical endodontic treatment in private practice settings. The exclusion criteria were practitioners not engaged in clinical endodontics, public sector dentists, full-time academics, and community-service dentists (a compulsory government internship year in South Africa).

The survey was distributed by electronic means. Social media platforms, including Facebook (Facebook Inc., Menlo Park, CA, USA) and WhatsApp (Facebook Inc., Menlo Park, CA, USA), were used to increase the visibility of the survey to the target groups. Responses were captured online using the Qualtrics platform. A mixed-method survey design (consisting of both quantitative and qualitative questions with open-ended responses) was used. Topics included the following:

- Demographic information
- Management/referral strategies regarding difficult endodontic cases
- Need for endodontics as an independent dental specialty in South Africa.

Participants were invited to complete the survey in July 2018. Follow-up requests to participate were repeated at 1- and 2-month intervals before the closing date (October 2018). A minimum of 213 responses was required to ensure that the results were representative of the views of the study population. The confidence level was set at 95% with a 6.5% margin of error.

The online data was accessed and exported as a comma-separated values format. Microsoft Excel 2016 was used for initial data evaluation. Simple descriptive statistical analysis was performed using the Statistical Package for the Social Sciences version 22 (SPSS, IBM Corp., Armonk, NY, USA).

RESULTS

A total of 215 responses were received by the closing date. Of the total number of respondents, 21 (10%) were

Table 1: Questionnaire completed by the respondents

Question	Type of response	Options
1. Are you a general dental practitioner or specialist prosthodontist, working in South Africa, who performs endodontic treatment in private practice?	Multiple choice	Yes/no
2. What is your gender?	Multiple choice	Male/female
3. In which province do you practice?	Multiple choice	9 South African provinces listed
4. In what year did you qualify as a dentist?	Numerical response	Year of qualification
5. At which university did you complete your undergraduate dental degree? (if you obtained a dual degree through both the Universities of Stellenbosch and Western Cape, please indicate "other" and specify this) - selected choice	Multiple choice	University of Pretoria University of Stellenbosch University of Witwatersrand Sefako Makgatho Health Sciences University (Previously University of Limpopo/Medunsa) University of the Western Cape
6. Are you a specialist prosthodontist?	Multiple choice	Yes/no
6. How many years have you been in private practice? (general dental practice and specialist prosthodontics practice combined, if applicable)	Numerical response	-
7. Which of the following would you consider the most appropriate description of your scope of practice:	Multiple choice	General dental practice Specialist prosthodontics practice General practice focused on endodontics
8. Do you have a postgraduate qualification in endodontics? Select multiple responses if applicable	Multiple choice	I have no additional qualification in endodontics Postgraduate diploma or equivalent MSc or equivalent PhD or equivalent
9. What is your management protocol for difficult endodontic cases?	Multiple choice	Manage and complete the case to the best of my ability Refer to an experienced general dentist with no additional postgraduate training in endodontics Refer to a general dentist with postgraduate training in endodontics Refer to a general dentist with postgraduate training in endodontics who has a practice focused on endodontics Refer to a specialist prosthodontist Refer to an academic institution Offer extraction therapy to the patient instead of endodontic treatment
10. Do you feel that there is a need for specialist endodontists in South Africa?	Multiple choice	Yes/no
11. Last question: briefly explain why you feel that there is a need for specialist endodontists in South Africa?	Open ended	-
12. Last question: briefly explain why you feel there isn't a need for specialist endodontists in South Africa	Open ended	-

excluded as they indicated not conducting endodontic treatment in private practice. One respondent provided unintelligible responses to several questions and was also excluded. All valid responses of the remaining 193 respondents were included for evaluation.

Demographic information

Eleven SPs (18%, $n = 11/61$) and 182 GDPs (5.7%, $n = 182/3191$) responded to the survey, constituting a combined overall response rate of 7%. The male ($n = 89/193$) respondents were slightly lower than female ($n = 104/193$). The date of qualification and number of years of private practice experience were broadly distributed.

Responses were received from graduates of all four national dental schools training GDPs and SPs. Every South African province was represented. Two respondents (1.0%) indicated completing their undergraduate training outside of South Africa.

Less than one-fifth of the respondents (17.1%) held a formal postgraduate qualification in endodontics (such as an MSc or postgraduate diploma in endodontics). The majority (82.9%) reported having no additional postgraduate endodontic training.

Strategies for the management of difficult endodontic cases

Respondents reported several different approaches/strategies in the management of difficult endodontic cases. The majority of the respondents indicated a preference to refer difficult endodontic cases to a general dentist holding a postgraduate endodontic qualification and focusing/limiting their practice to endodontics (42.5%), followed by attempting to complete a difficult case to the best of their ability (24.4%) or referring the case to a colleague who possessed additional training in endodontics, but did not limit their practice to the discipline (14.5%). Some respondents indicated referring to SPs (7.8%) or GDPs with no additional endodontic training (6.7%). Referral of difficult

cases to academic institutions was uncommon (1.5%). Some respondents offered extraction therapy to their patients instead of endodontic treatment (2.6%).

Need for endodontics as a specialty in South Africa

The majority of the respondents (83%, $n = 160/193$) agreed that a need exists to train specialist endodontists in South Africa. The remaining respondents (17%, $n = 33/193$) indicated the opposite belief.

The respondents who indicated believing that South Africa should train specialist endodontists were requested to briefly explain the rationale for their opinion in an open-ended response. The following themes (i.e., patterns of shared meaning across participant responses, underpinned by a central concept) emerged from the responses of the participants (more than one theme may, however, have been represented in an individual response):

1. Difficulty level of certain endodontic cases (38.0%)
2. Higher level of care for patients/improved treatment outcomes (19.2%)
3. Average dentist not adequately trained/skilled to provide advanced endodontics (17.1%)
4. Cost and time factors too high to complete ideal treatment (13.0%)
5. Limited number of practitioners (PDs) in close proximity who have advanced skills/interest in endodontics (10.4%)
6. To avoid unnecessary extractions (7.8%)
7. Dentists with advanced endodontic training should be recognized as specialists (4.1%)
8. Prosthodontists deal more with restorative cases/different focuses between prosthodontics and endodontics (4.1%)
9. Invalid responses (3.6%)
10. Endodontics is a recognized specialty of dentistry in many other countries (2.6%)
11. Threat of litigation (0.5%)
12. Referral without losing the patient to another GDP (0.5%).

The respondents who did not believe South Africa should train specialist endodontists were similarly asked to explain the rationale for their opinion. Their responses were similarly grouped according to the following themes:

1. Cost of specialized endodontics too high for patients to afford (27.3%)
2. GDPs with advanced skills/qualifications can manage difficult cases (24.2%)
3. GDPs without additional endodontic training can manage both routine and difficult cases (21.2%)

4. Prosthodontists can manage difficult endodontic cases (18.2%)
5. Field too small to warrant separate specialty (6.1%)
6. New techniques make it easier to perform good endodontics (6.1%)
7. Invalid responses (6.1%)
8. Lower cost of alternative options (e.g., affordable implants) (3.0%)
9. Decline in need for endodontics due to alternative treatments (3.0%).

DISCUSSION

Dental specialist training and experience have previously been demonstrated to influence endodontic decision-making.^[11,12] The decision, for example, to initiate endodontic retreatment has been shown to differ significantly between GDPs and postgraduate endodontic students (specialists in training).^[13] Such differences in decision-making may correlate directly with a potentially superior expertise set of endodontic specialists. This assertion is supported by the findings of Burry *et al.*, who reported improved endodontic treatment outcomes of primary root canal treatment when performed by endodontic specialists as compared to GDPs.^[14]

Gulabivala *et al.* explain the nature of the discipline of endodontics to be unique, requiring a multitude of tactile skills.^[1] A constantly growing need exists in both the clinical and academic environments for the development of basic endodontic programs at the undergraduate level and more advanced programs on a postgraduate level in order to adequately manage complex cases.^[1] Integration of both basic (undergraduate) and advanced postgraduate programs may prove beneficial to the public and oral health provision in South Africa. The argument for acknowledging endodontics as an independent South African dental specialty should be seriously considered in light of a high prevalence of complex endodontic cases in order to improve treatment outcomes.

Outside of South Africa, difficult endodontic cases are often referred to endodontic specialists.^[15] The majority of the respondents in the present study reported the need to refer difficult endodontic cases to colleagues (73%, $n = 141/193$), and less than one-quarter of the respondents reported performing all their own endodontic treatments independently (24.4%). This is in agreement with the findings of Ree *et al.*^[15] The most frequent referral route reported in the present study was from GDPs to other general practitioners holding postgraduate endodontic qualifications focusing/limiting their practice

to endodontics, followed by those with additional endodontic qualifications who practice general dentistry. Naidoo's 2006 survey of South African GDPs polled the attitudes to, techniques employed by, and materials used in endodontics in the country. He reported that 91% of the respondents believed that their endodontic treatment could be improved upon from a technical point of view, with half indicating that they would refer difficult endodontic cases to colleagues.^[10] The need for a formal specialist endodontic referral pathway in South Africa is apparent from the findings of both the present study and Naidoo's investigation.

Despite being the only dental specialty in South Africa performing nonsurgical endodontic treatment,^[16] the reluctance of the respondents to routinely refer difficult endodontic cases to prosthodontists was evident (7.8%). A similar number of respondents indicated referring difficult cases to general practitioners with no additional endodontic training (6.7%). This may be due to the respondents' belief that SPs are not necessarily better equipped or trained to deal with complex endodontic cases than a GDP holding an endodontic postgraduate diploma. A limited number of SPs^[17] may also contribute to a reduction in referrals to this group of practitioners.

Referral of endodontic cases to academic institutions was uncommon (1.5% of the respondents). This finding can be explained by the fact that only four academic dental hospitals exist in South Africa^[17] and these may be situated great distances from referring dentists. These facilities may also have long waiting lists.

Less than one-fifth of the respondents indicated a belief that South Africa should not train endodontic specialists (17.0%). The most common reason provided was the perception of high financial cost to patients for the provision of specialized endodontic care (27.3%). This view is, however, unfounded, as private health insurance (medical schemes) in South Africa spend more on reimbursement of specialists as compared to GDPs.^[18] Furthermore, the increased cost of specialized care should not preclude the existence of expertise and training to deal with complex endodontic cases. A number of respondents in this group indicated the view that existing providers, whether PDs or SPs, could manage both simple and difficult cases. The existing pattern of referral reported in the present study, however, contradicts this view. A small number indicated that endodontics is too small a field to warrant a separate specialty and that lower-cost alternative treatment option was available. The respondents' preference to preserve natural teeth rather

than performing extraction therapy was a positive finding, especially in light of recent literature suggesting that dental implant success rates may be overinflated and carry their own risks and complications.^[19]

Despite the low overall response to this survey, the sample size obtained ($n = 215$) was sufficient to represent the views of the target population. The response rate – albeit disappointing – is in line with those of previous South African online survey investigations evaluating similarly sized target groups. The use of online surveys to elicit the views of members of the SADA database has been previously used in several studies.^[20-22] The findings of the present study may, therefore, be considered valid for the target group identified, however, it is important to note that the findings may not be representative of the views of all registered dentists in South Africa – a number Bhayat and Chikte estimated to be approximately 6 125 in 2015.^[17] Responses, however, were obtained across a wide distribution of ages and a large geographical area, with approximately equal representation of both males and females. This broad distribution was encouraging, as the sample appears heterogeneous. While an underpowered sample size may be a limitation of the present study, valuable information regarding the views and beliefs of South African private dental practitioners engaged in the clinical practice of endodontics was obtained for the first time.

Public sector and community service dentists were excluded from this survey as a number of these practitioners may not routinely perform endodontic treatment. The views of academics and dental students were not obtained as these are envisioned to be the subject of future investigations.

The creation of new specialties in health care is common. Family medicine was established as a new specialty in South Africa in 2007 after a clear need for such practitioners was identified.^[23]

One limitation of the present study was that it merely elucidated the opinions of private dental practitioners engaged in the clinical practice of endodontics. Further epidemiological and economic studies should be conducted which may add further weight to support the argument for the development of endodontic specialty training programs in South Africa. Broader consultation with other medical and dental specialties, public sector GDPs, academics, and students will also be required before any attempt is made to establish a curriculum for a formal specialty program.

The results of this study may be used to initiate discussions between different role players in the profession regarding the need for and feasibility of establishing endodontics as an independent South African dental specialty.

CONCLUSION

Within the limitations of this study, the majority of the respondents believed a need existed in the country to train specialist endodontists to properly manage difficult/challenging endodontic cases beyond the competency of the average GDP and SPs for better treatment outcomes.

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Conflicts of interest

There are no conflicts of interest.

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