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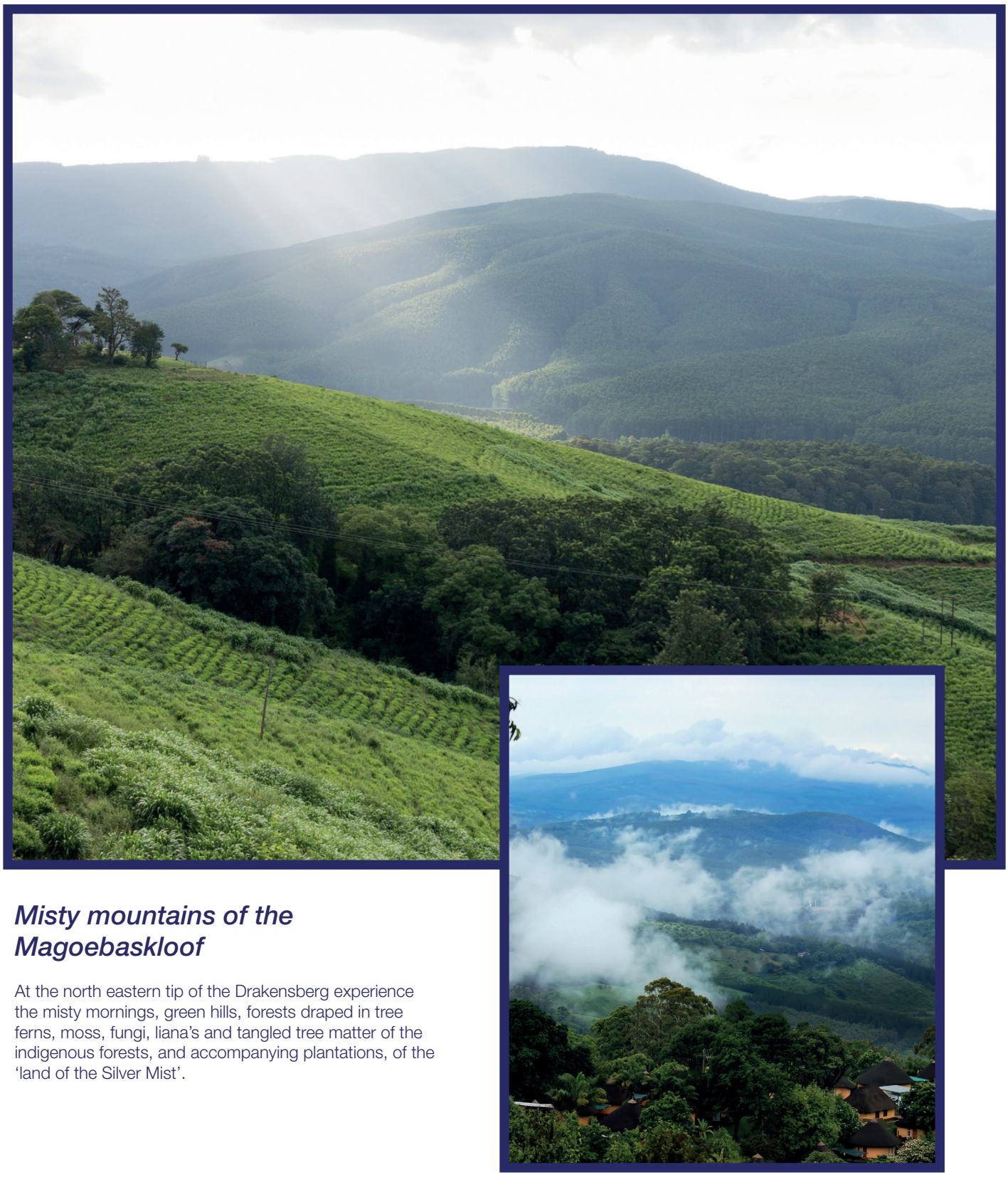

Misty mountains of the Magoebaskloof

At the north eastern tip of the Drakensberg experience the misty mornings, green hills, forests draped in tree ferns, moss, fungi, liana's and tangled tree matter of the indigenous forests, and accompanying plantations, of the 'land of the Silver Mist'.

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AGM
Annual General Meeting

NOTICE OF AMENDMENT
23rd ANNUAL GENERAL MEETING (AGM) OF
The South African Dental Association NPC ("SADA")

An amended notice is hereby given that the 23rd Annual General Meeting of Members (AGM) of The South African Dental Association (SADA) NPC, will be held on **Thursday 3 August 2023 at 18h00,** which will be conducted virtually on this date through the Zoom virtual meeting platform. **The Agenda together with supporting documents for the meeting will be sent electronically to members and posted on the SADA website.**

Members are advised that they must have access to a computer or smart device or dial-up facility in order to join the online meeting. In view of extraordinary circumstances and to ensure maximum participation of voting members on resolutions tabled at an AGM, we call for the early return of proxies from members who are unable to attend.

Questions from members: We are encouraging members to raise questions prior to the AGM, thereby allowing those not in attendance, the opportunity to raise issues that can then be dealt with at the AGM or referred to the National Council meeting. This will also assist with the present electricity load-shedding schedules which prevent members from attending. The questions and answers covered in the AGM will, following the meeting, be published on the Association's website.

SADA is *your* Association and *your* voice counts.

KC Makhubele
Chief Executive Officer
May 2023

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Our Front Cover for this Issue...

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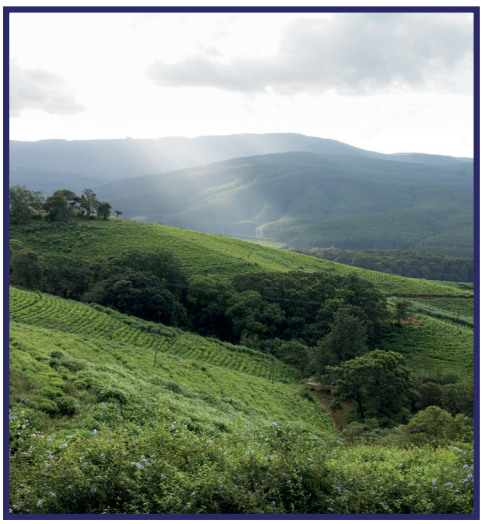

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Driving oral-health transformation in South Africa: The need for a roadmap to implementing the WHO Resolution

SADJ June 2023, Vol. 78 No.5 p229

Prof NH Wood - *BChD, DipOdont(MFP), MDent(OMP), FCD(SA), PhD*

The World Health Assembly's adoption of the Resolution on oral health in 2021 was a turning point in the worldwide effort to advance oral health outcomes. The resolution underlines the significance of promoting oral health, integrating oral health care within the primary health-care system, and ensuring universal coverage, shifting the paradigm from a curative to a preventive approach. In this editorial, a prospective action plan is explored that would include a national oral health survey, short-, medium-, and long-term goals, as well as appropriate regulations and procedures to fulfill the WHO's 2030 target. With the roll-out of the National Health Insurance (NHI) bill, complying with these resolutions are becoming more important and urgent.

It is essential to conduct a thorough national oral health survey before the implementation process can begin. Such a survey would offer useful baseline information, evaluate the population's oral health condition, and highlight common oral health problems and inequities. It would aid in comprehending the infrastructure and resources already in place as well as in assessing the present oral health promotion and prevention initiatives. Indicators of oral health, oral hygiene practices, the prevalence of dental caries, periodontal disease, and the quality of life associated with oral health should all be included in the survey's design.

Immediate actions

Raising awareness and encouraging oral health in families, schools, and workplaces should be the immediate goal of the action plan. To underline the value of oral health and the importance of preventive measures like routine brushing, flossing, tobacco-use cessation programs, and keeping a balanced diet, education and awareness programs among others should be launched. The incorporation of oral health promotion programs into curriculum and workplace wellness initiatives can be made easier by collaboration with businesses and educational institutions.

Additionally, regular basic healthcare visits must include dental health exams and preventive measures. Oral health will be integrated into the primary healthcare system by forming partnerships with primary healthcare practitioners and instructing them in the most fundamental oral health interventions. Additionally, community outreach initiatives can be set up to give oral health education and preventive care to underprivileged communities.

Mid-term actions

The inclusion of oral health within the non-communicable disease (NCD) agenda should be given a high priority in the mid-term plan. Collaboration between experts in oral health and other healthcare fields is essential for successful implementation. To improve the comprehension and coordination of oral health care as part of comprehensive healthcare delivery, interprofessional education and collaboration should be encouraged. The gaps between the many healthcare fields might be filled by joint conferences, workshops, and research projects. The incorporation of oral

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health therapies in universal health care programs is another crucial component of the midterm plan. Services for oral health, such as preventive, restorative, and emergency care, should be included in current health insurance programs. For these programs to be sustained, adequate funding, reimbursement procedures, and incentive programs for oral health professionals' participation are required.

Long-term actions

According to the worldwide strategy on oral health, the long-term goal intends to attain universal health coverage for oral health by 2030. This necessitates an all-encompassing strategy that includes policy adjustments, infrastructure construction, workforce planning, and research improvements. Governments should give oral health top priority by allocating enough funds, enacting beneficial policies, and creating regulatory frameworks to direct oral health services. I must emphasize that this is dependant on the data that will be gathered by performing a new national oral-health survey.

Infrastructure growth should concentrate on enlarging dental clinics and integrating them with current medical facilities. The current picture of oral healthcare access is very unclear at a provincial and national level. Rural communities, underserved places, and underprivileged groups need special consideration. To address the rising demand for oral health services, it will be crucial to increase the workforce capacity, alongside appropriate equipment and facilities provision in this field through training programs, ongoing education, and recruitment efforts. The link between system and overall patient health and well-being, and oral health, must be reinforced regularly and evidence must be presented to policy-makers and managers in various structures and organizations.

To develop evidence-based interventions, assess the efficiency of preventative measures, and track progress towards reaching the WHO targets, significant research activities need also be launched. To promote innovation and spread best practices globally, collaborative research networks, financing possibilities, and knowledge dissemination platforms should be formed.

Contributions from the private sector

The success of the WHO strategy on oral health depends in great part on the private sector, which includes a variety of organizations from small private dentist offices to huge dental corporations. Private dental offices, as crucial providers of oral healthcare, can actively participate by integrating the preventive strategy promoted by the resolution into their services. In their practices, they can place a strong emphasis on prevention, patient education, and oral health promotion, inspiring patients to practice good oral hygiene and make well-informed choices about their oral health. These practices should be encouraged to create local outreaches to schools, and similar community outreach projects. Additionally, private dental clinics can work with academic institutions and public health organizations to take part in community outreach initiatives that target marginalized groups and raise awareness of oral health.

On the other hand, the private sector's dentistry businesses can make a difference by developing new products. These businesses can create novel technologies, materials, and

treatment methods that promote restorative and preventive oral healthcare by investing in research and development. Collaborations between dental businesses and academic research facilities can accelerate the conversion of scientific findings into real-world clinical applications, which is advantageous to both the public and commercial sectors. Dental businesses can also sponsor conferences and symposiums, support programs to educate people about oral health, and help the spread of knowledge and best practices.

The active participation of the corporate sector in the WHO plan has many benefits, including the mobilization of resources, knowledge, and financial support. Dental enterprises can help make oral healthcare goods and technologies more affordable and accessible by utilizing their market clout and business savvy. In order to build patient-centred policies and programs, private dental practices, which are motivated by patient-centred care, can provide insightful input based on their direct encounters with patients.

To make sure that the private sector's contributions are in line with the broad objectives of the WHO resolution, it is essential to promote cooperation and communication between the public and private sectors. The strengths of both sectors can be effectively used to accomplish the desired results through transparent collaborations that are led by shared values and beliefs. In the end, the private sector's involvement will strengthen the WHO plan's viability, scope, and impact, advancing the goal of achieving universal oral health coverage by 2030.

Conclusion

A planned and comprehensive action plan must be in place in order to implement and comply with the WHO resolution on oral health. A national oral health survey can help create short-, medium-, and long-term plans to ensure that oral health promotion, prevention, and care are integrated throughout the healthcare system. By adopting an all-encompassing strategy, governments and healthcare systems may pave the path to obtaining universal oral health coverage, thereby enhancing the outcomes and general wellbeing of people and communities around the world.

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Lessons learned: reacting, rebounding and recovering from dental clinical failures

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Mr KC Makhubele – CEO, South African Dental Association

Dental professionals all endeavour to provide their patients with the best possible care, utilising their skills, knowledge and experience to ensure positive results. Nevertheless, despite their best efforts, dental clinical failures can occur, leaving the patient and dentist to deal with the repercussions. In this article, we will discuss how to react, regroup and recover from dental clinical failures, drawing from strategies for dealing with the aftermath and learning from these experiences.

A proactive and compassionate approach is necessary when addressing dental clinical failures. It is essential to acknowledge and address the situation promptly and professionally. The first stage is to communicate openly and honestly with the patient, providing a detailed explanation of what went wrong, accepting responsibility for the failure, and expressing genuine compassion for the patient's concerns and emotions. Dentists should also engage in self-reflection and self-evaluation, conducting an objective analysis of the failure and determining its fundamental cause. Colleagues, mentors and professional organisations can provide valuable insight and direction when consulted.

Recovering from clinical failures in dentistry requires resilience and adaptability. Dentists should be prepared to take the necessary corrective measures to rectify the error and prevent its recurrence. This may involve revising the treatment, providing the patient with additional care or referring them to a specialist. Dentists should prioritise the patient's best interests even if it requires incurring additional expenses or time commitments. It is crucial to maintain a positive and proactive attitude, concentrating on finding solutions rather than ruminating on the failure itself.

Recovering from dental clinical failures may necessitate overcoming legal, ethical and financial obstacles. Dentists must be aware of their legal and ethical responsibilities and adhere to the proper protocols when handling clinical failures. This may involve documenting the failure, discussing it with coworkers or mentors, and potentially involving legal or insurance experts. Refunds, reimbursements and insurance claims should be handled in a transparent and accountable manner. Dentists should also take measures to safeguard their professional reputation by addressing patient concerns, communicating openly with patients and implementing corrective measures.

Aside from the immediate aftermath of a clinical failure in dentistry, dentists should also prioritise long-term recovery and development. Failures can provide a valuable opportunity for professional growth and development. Dentists should consider the failure lessons and implement changes to their practices to prevent similar incidents in the future. This may involve refining treatment protocols, enhancing patient communication, enhancing clinical skills through continuing education or seeking out mentorship or peer support.

After a dental clinical failure, dentists should prioritise their emotional health in addition to their professional development. After a failure, it is normal to feel guilty, frustrated and apprehensive. Dentists should acknowledge and process these emotions healthily by seeking support from trusted colleagues, mentors or loved ones, practising self-care and engaging in enjoyable and relaxing activities. Obtaining professional assistance from a therapist or counsellor can also be advantageous for grappling with the emotional effects of a clinical failure.

In addition, dentists should maintain a positive attitude and not allow a failure to characterise their entire professional careers. It is essential to keep in mind that failures are an integral part of the learning process and that every dentist, regardless of experience or expertise, will experience clinical failures at some point. Instead of ruminating on the failure, dentists should concentrate on their strengths, achievements and positive impact on the lives of their patients.

In conclusion, clinical failures in dentistry can be difficult experiences that can plague us as dental professionals. Nevertheless, how we react, rebound and recover from these failures can have a significant effect on the outcome. It is essential to respond proactively and compassionately by engaging in open communication with the patient and engaging in self-reflection. Regrouping requires resiliency and adaptability, as well as the execution of corrective measures.

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Learning experiences of undergraduate first-year dental and oral hygiene students at a South African dental university

SADJ June 2023, Vol. 79 No.4 p233-238
M Morule[1], A Bhayat[2], C Kruger[3]

ABSTRACT

Introduction

Students in higher education institutions endure many difficulties which may adversely affect their career choices, learning experience and academic success.

Aims and objectives

The aim of this study was to identify factors contributing to learning experiences of undergraduate dental and oral hygiene students during their first year of study at a South African dental university.

Design

Cross-sectional design that included quantitative and qualitative data.

Methods

An online questionnaire was used to capture the students' perceptions towards learning experiences and factors contributing to academic success. The sample consists of 84 first-year dental and oral hygiene students registered in the 2021 academic year.

Results

A total of 59 students responded (70%) and most of them reported to have problems with academic learning, time management, heavy workload and a negative attitude towards online lectures. Problems related to social learning included inability to make friends and lack of participation in university social activities, finances and accommodation. In terms of coping mechanisms, students utilised tutoring classes, sought advice from senior students, watched educational YouTube videos and applied for a study loan or bursary. Students reported to obtain emotional support from friends and family members and adopted a positive attitude resulting in committed self-motivation.

Conclusion

Most students had challenges with academic and social factors. Students requested they be assisted in time management skills and study skills, in coping mechanisms to deal with a demanding workload and having access to an educational psychologist.

Keywords

Dental students, oral hygiene students, teaching and learning, dental education

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INTRODUCTION

Students in higher education institutions go through many difficulties which may adversely affect their career choices, learning experience and academic success.[1] For a first-year undergraduate student, university presents a foreign set of norms, traditions and a new academic language and environment. Evidence supports that most first-year undergraduate students encounter many challenges such as adapting to a university environment, coping with academic work, financial difficulties, personal problems and self-regulated learning.[2]

The teaching and learning at universities is very different compared to the schooling system and students have challenges dealing with this change in the teaching and learning styles.[3] In addition, some students have difficulties coping with personal, emotional, financial and time management issues.[4] As a result, many students find it hard to cope and this results in a relatively high failure rate.[4] Considering the role of transition for first-year undergraduate students, it is important to gain insight into how the learning experience for these students is affected by the academic adjustments and the extent to which academic adjustment influences student success. This paper presents an investigation that focused on a selected university, school of dentistry students in transition to university to assess learning experiences and challenges, as well as the overall factors in coping strategies and optimism.

The aim of this study was to identify the learning experiences of undergraduate dental and oral hygiene students during their first year of study at the selected university.

METHODS

A cross-sectional study design was used to collect the data. Participants were selected by means of purposive sampling. There were 14 oral hygiene and 70 dental students who were registered in the 2021 academic year and all of them were invited to participate. Participants were recruited to the study in the beginning of their second year through class visits and the purpose of the study was

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explained to the class. A request to share the link with one module coordinator was made.

A secured link to an electronic questionnaire was then distributed via blackboard learning management system to only this sample group through registered module code and students could access the link securely and participate anonymously. No name was required when completing the questionnaire. This ensured anonymity was maintained. The questionnaire was in English and strictly anonymous. All information was confidential. The sample consisted of 84 first-year undergraduate students enrolled in the dental and oral hygiene programmes at a dental university in South Africa. Ethical approval was obtained from the Research Ethics Committee (REC 456/2021).

Questionnaire construction

The questionnaires were created using the Qualtrics® online platform. The questionnaires had an introductory page featuring the informed consent which introduced the researchers, provided a brief description of the study explaining the purpose, procedures and rights of participants, and asked participants' consent to participate in the study. This was self-developed questionnaire guided by previous studies that explored first-year students' experiences at university and modified to suit local context. Students were asked to reflect on and write about their learning experiences in the first year of study. The questionnaires were divided into three sections (A, B and C) where section A contained questions relating to expectations and transition to university; section B contained questions relating to adjustment in relation to academic and social factors; and section C contained questions asking about challenges students faced and coping mechanisms employed. Data captured within these sections included academic workload, peer engagement, teaching perceptions, study methods, factors contributing to academic success and suggestions and recommendations to overcome challenges. Demographic information on the participants such as age, gender, race and academic discipline was included in the questionnaire.

Data analysis

Responses were coded to identify major themes and patterns (Braun & Clarke, 2006). The data analysis process commenced with the first two authors reviewing the six steps of the data analysis method and gaining familiarity with the dataset. Data were independently analysed and coded for themes. The three authors convened to compare and discuss the codes and themes identified, allowing for triangulation and rigor within the data analysis process. All categories and themes were saturated. The questionnaire was primarily qualitative in nature; where responses were clustered due to high number of similar answers, a quantified calculation was made to express that frequency.

RESULTS

A total of 59 students completed the questionnaire (response rate=70%) and their demographic data is reported in Table 1.

LEARNING EXPERIENCES AND CHALLENGES

Expectations and transition to university

More than half of respondents indicated that the transition from high school to university was challenging as noted in the following statements Pt 1: *"I expected to have a lot more time for friends and social life, where in reality I struggle to make time for that;* Pt 2: *"I thought it was going to be academically accommodating instead of having many things happen at once, where it's deadline after deadline and test after test, I didn't think I'd struggle with financial aid".* These statements were followed with comments such as Pt 3: *"It was hard to adjust, but once you get used to it, it feels normal. I just had to push through".*

A few students mentioned some positive expectations recorded as Pt 6: *"Vibrant campus atmosphere;* Pt 14: *"Opportunity to meet new people"*; Pt 22: *"I expected the university to have high standards and to provide us with excellent education".*

Academic and social factors

Students were expected to explain in detail the experiences on how they adjusted to the academic and social environment of the university.

Time management

Most students had challenges with regard to time management as follows Pt 3: *"Too many assignments in one week and never enough time to study all the work".* Another student said Pt 17: *"Very stressful because about 3-4 modules would have assignments and test due at the same time or the same week, plus one had tests to study for. So, it felt heavy".*

Workload

Students found the university workload challenging and complicated reporting Pt 30: *"The amount of work from school to varsity was extremely overwhelming", and* Pt 26: *"The school did not prepare us according to workload".* Some students quoting phrases such as Pt 12: *"It is exhausting";* Pt 27: *"Intense workload";* Pt 33: *"Stressful"; Pt 40: "Barely cope".*

Table 1: Response rate by participants in the study

Degree	Number of registered students	Response rate (%)	Age range in years	Gender
Oral hygiene	14	14 (100)	18-22	Female 8 (57%) Male 6 (42.86%)
Dentistry	70	45 (64.3)	19-31	Female 31 (44.29%) Male 14 (20%)
Combined	84	(59) 70	21 (±3.02)	Female 39 (66%) Male 20 (34%)

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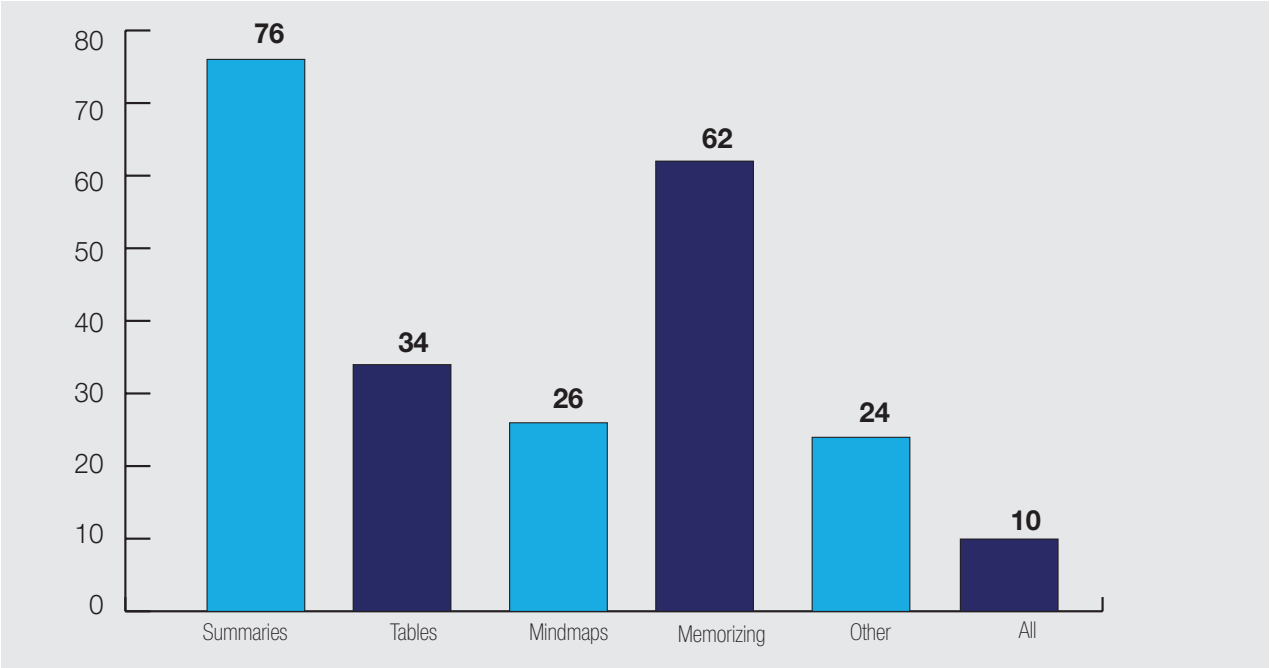

Figure 1. Students' preferred studying methods.

Online teaching

The Covid-19 pandemic caused a lot of sudden changes to the traditional teaching and learning activities and the closure of campus-wide activities brought undesirable distress for many students. Some students described the online teaching process as Pt 6: *"I did enjoy the fact that it was online ... I was able to be more productive and focus without spending time on getting to campus"*, Pt 13: *"I for one did not enjoy any online lectures, I wish for a physical class. But with the circumstances one had to make adjustments, and this is where recordings of lectures were a big help"*, Pt 20: *"It was difficult to communicate online and understand concepts"*, Pt 24: *"Being online the whole year discouraged me at times"*. Another student explained: Pt 32: *"To this day I hate online classes and assessment. I do not feel like I am actively learning because I am a visual learner and online does not help to improve that so I had to study harder with less understanding"*.

Study methods

The majority of students preferred to work and learn on their own as they felt that they had more control on the outcome and learnt from their own mistakes. However, 31% reported they preferred working in a group, because they could exchange opinions and knowledge, collaborate ideas and motivate one another.

In terms of studying methods, the majority reported preferences in making summaries while others prefer to just memorise the concepts, with a very few students preferring to use a combination of studying methods as shown in Figure 1.

Overall, 79% students reported taking their own notes while 62% preferred to listen to recorded lectures when learning as shown in Figure 2.

SOCIAL FACTORS

These results were varied and some of the examples were Pt 32: *"Not having a relationship with everyone in class made me felt like an outsider and it became difficult to communicate and relate with my classmates as we didn't get the time to know each other"*. Some of the responses included Pt 44: *"I can say it's really hard to be a first-year student, having to adjust to a new place, being taught electronically, meeting new people, everything seems to be overwhelming and one can go through depression if they bottle up things and never share their academic problems and address them"*.

Students responded about social difficulties experienced due to Covid-19 restrictions such as Pt 11: *"Social environment in first year was not great, because we were fully online and social activities were not allowed"*. The majority of students commented that it was difficult to socialise and make acquaintance with fellow students as all classes were online in their first year and communication mostly took place over WhatsApp. For example, one student reported Pt 5: *"I loved having people around me but online learning made it very hard to meet people"*.

Challenges

The majority of students commented they struggled to adjust and to keep a balance between academic and social life, Pt 44: *"I found it difficult to adjust which affected my grades negatively"*. Another challenge commented on in relation to difficult adjustment was balancing time and workload, Pt 11: *"Because I have to work to help pay for my studies it did influence the time I could spend studying and that makes my marks fluctuate"*.

Some students explained Pt 32: *"The challenges were studying online and trying to stay focused and motivated"*; Pt 15: *"Studying online/online learning is a lot more difficult than you think it is"*, *"Connection issues which affected some of my lecture sessions"*. The noted negative experiences of students with online were indicated Pt 5: *"Because of the little in-person contact we had in first year, I did not have the confidence to ask assistance from my lecturers as I did not see them often"*. Most students further reported difficulties with access to Wi-Fi and unstable internet connections and trying to stay focused during online classes.

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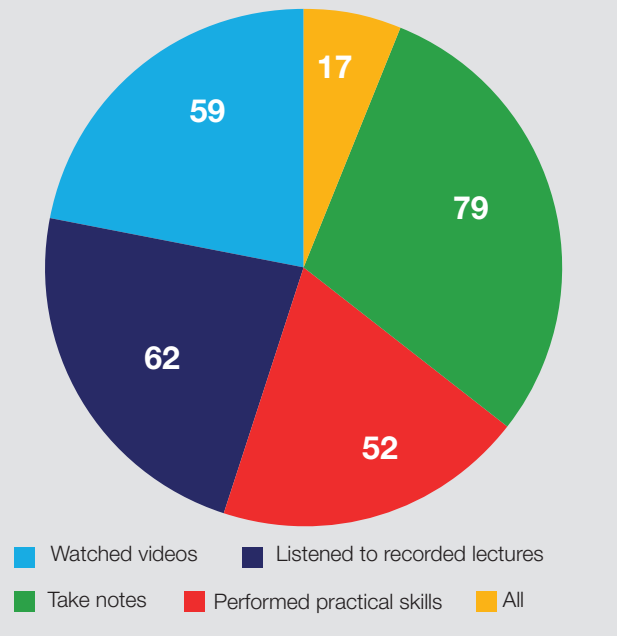

Figure 2. Methods of learning

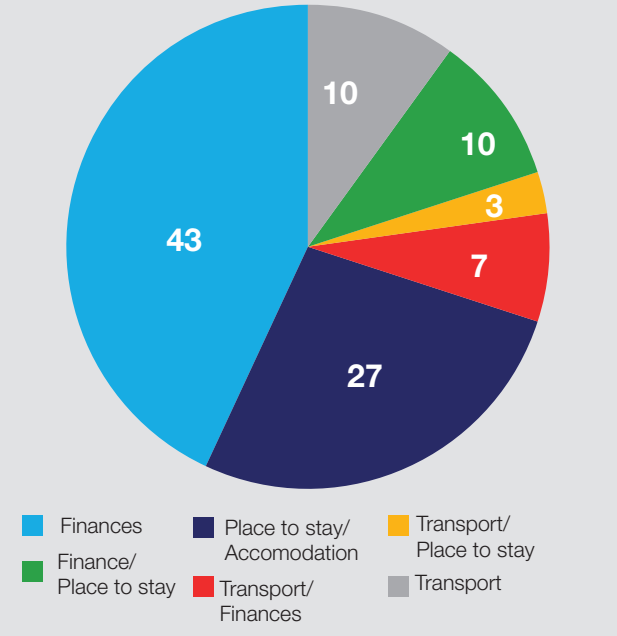

Figure 3. Challenges experienced as first-year students.

Additionally, self-motivation and a lack of guidance and support from academic staff was also a challenging factor for many students. Students reported Pt 10: *"Lecturers do not communicate with each other and thus we end up having assignments/tests due on the same day"*. The optimistic experiences included Pt 19: *"It was hard to get back marks that weren't good. It really broke my motivation and many times I have wondered if the degree is for me if I am doing so poorly. Luckily, I am still here and am glad I did not give up after getting bad marks"*.

Students also experienced various challenges with regard to transport, finances and accommodation, Figure 3. Even though some respondents mentioned that they had no financial problems, some merely responded "none" while others gave explanations such as Pt 11: *"I missed out on a few classes in first semester because I did not have accommodation"*. Some students experienced difficulties with finances and reported that Pt 12: *"The study costs were more expensive and it was difficult to pay"*.

Coping mechanisms

Some students reported to dedicate more time to study, preparation before class and follow-up after class, Pt 19: *"Had to work hard to prepare in time, created a study timetable to plan their tests, assignments and examinations"*; other statements included Pt 15: *"These require a lot more planning and discipline than we had in school. Assignments are started as soon as they become available and detailed study schedule made and updated every week"*.

In response to how they manage to cope with workload, students reported that Pt 6: *"I divided most of my work into chunks; in that way I could keep up to date with my work and not fall that much behind"*; Pt 24: *"I learned to manage my time and become more disciplined; making sure I keep up with the work by attending classes helped to manage workload"*; Pt 20: *"Being consistent in my commitment to learning"*.

Utilisation of tutorial classes, use of mentors and student advisers and senior students were some of the reported mechanisms students commented were helpful for them, Pt 21: *"I wasn't sure how to approach some modules, so I asked my mentor for advice, which helped a lot"; "attending tutorial classes helped"*. While other students commented Pt 15: *"I had to adjust, it is what it is. No choice"*; Pt 12: *"I tried creating a timetable but it didn't work because I didn't follow it, so I just did what needed to be done whenever I could"*.

Moreover, to cope with the finances and other additional challenges, students reported they took initiatives such as Pt 11: *"Have to work to help pay for my studies and that does become very draining"*. Most students added Pt 15: *"Communicate with other students about transport"*; Pt 17: "Tried making up a budget for myself"; Pt 18: *"Find accommodation closer to campus"; "Move into a flat with flatmates"*. While others indicated Pt 28: *"Got study loans and bursary"*.

Some of the responses in relation to coping mechanism included Pt 12: "Emotional support, friends and fellow students"; Pt 6: *"Positive mindset and supportive family"; "Hard work"*. Similarly, another student explained Pt 24: *"It was hard to cope, but once you get used to it, it feels normal"*. Other students further made choice to Pt 27: *"Attend less parties and focus on work over the weekend"*; Pt 40: *"I had to make huge adjustments, including leaving sports"*.

Factors contributing to academic success

As in the previous reporting, most students reported Pt 6: *"Planning ahead of time and putting in extra hours to study"*, and students taking the responsibility of *"Making sure they attend all classes and keep track of assessments that need to be done"*. Additional comments were Pt 42: *"Planning ahead, dedication and embracing the transition from high school to university"*; Pt 43: *"Starting in advance and not procrastinating helps to reduce stress"*. Other students explained Pt 44: *"Good time management and a good balance"*.

Other efforts included a study group, watching YouTube videos, emphasising the use of mentors and utilising tutors

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by giving examples such as *"Getting guidance from fellow students and senior students".* In explaining the social factors contributing to their academic success, students mentioned they received Pt 6, Pt10: *"Social supports from friends and family"; "Constant motivation by students in higher years"; "Having more interactive contact sessions with the lecturers".*

Even though there were some contradicting perceptions regarding academic support, a certain extent of support from academic staff was also mentioned by some students. Students' responses included Pt 12: *"Not always assisted when you needed help, some lecturers would help but others wouldn't";* Pt 13: *"We didn't know our lecturers since it was online";* contrary, other students' responses were such as Pt 23: *"Our lecturers were very willing to help if we had any problems and would give us tutorials for lectures we didn't understand";* Pt 14: *"The lecturers were always eager to assist with everything, and they always reminded us of that. However, I didn't use them because I didn't have direction, I was just taking everything as is".*

Regarding the suggestions and recommendations going forward, many students suggested Pt 11: *"Training of students in time management and study skills and how to cope with workload".* Some responses of students attested to the need for an educational psychologist such as in Pt 5: *"Perhaps regular workshops where students can be taught to deal with emotional and mental strain could be implemented, we could be taught about what burnout is, how to identify it and what to do once we have experienced it";* Pt 13: "Perhaps clarifying how to approach modules instead of just giving classes would help".

Other responses expressed the idea of adopting Pt 15: *"Positive attitude"* and opting to *"Study hard and sticking to the planned study schedule".* One student explained Pt 24: *"Requires a lot of discipline which was hard at first but made a personal timetable".* Other students commented Pt 36: *"I had a calendar with when I should study what and by when I should finish what. It really improved my productivity and felt very organised".*

DISCUSSION

A total of 59 students completed the questionnaire (response rate=70%) and the majority (66%) were female. This suggests that dental and oral hygiene professions are possibly mostly occupied by females. The mean age was 21 years and this was expected as students who enter university are usually between 18 and 24 years old. There were a few dental students who had completed a previous degree and hence they had a higher mean age compared to the majority who entered university immediately after finishing high school.

Consistent with other studies, participants in this study reported that there were pressures transitioning into a university environment which resulted in them making huge lifestyle adjustments.[6,7,8] Specifically, the intense workload, study context and inability to cope, suggesting that the high school environment did not prepare them for this transition phase; as mentioned in the report of the Council of Higher Education (CHE) and other studies.[3,9,10]

Beside the major concerns of transition from students, some of their responses relating to their expectations were positive – they referred to the university as a vibrant campus, an institution with a good system and social atmosphere. According to a similar study, some first-year students cannot develop a sense of belonging to the university environment when some social and academic expectations are not adequately met.[11] Hence students' expectations need to be gauged and plans put in place to try to address them as these could assist with the transition to university.

It must be noted that this university has several departments in place with programmes to assist students in transitioning into the university environment, including running extended orientations for students to highlight the various support services on offer. These strategies help to foster a sense of belonging to the university environment and improve the psychosocial transition of first-year students.[12] This was confirmed by a study which reported that the induction programmes play an important part in reducing the gap between students' expectations and experiences and this programme should include topics ranging from academic skills to wellness and stress management.[13]

This was also reported by other studies which showed that first-year students identified workload and an inability to manage their time effectively as their primary concerns.[14,15] The results also suggested that there was a need for lecturers to communicate expectations to students well in advance of deadlines so that students do not feel pressurised to perform at the last minute.[14] However, there may also be a need for students to plan and organise themselves better to meet deadlines, suggesting a mutual relationship between lecturers and students which is required.

While students were generally satisfied with the availability of online technologies, some expressed frustration trying to access Wi-Fi services, unstable internet connection, difficulty to stay focused for long online learning duration and, at times, difficult communication either with lecturers or with peer students which was in line with Ang's study.[2]

Students in this study concurred with other similar studies that reported that having perseverance and passion was directly proportional to the amount of academic success a person can achieve and a lack of motivation (intrinsic and extrinsic) had a negative effect on academic performance.[16,17]

Similar studies found that study skills influence academic performance and students with poor study habits were more likely to have adjustment problems in the transition from secondary school to university.[16] Certain personality traits as reported by Bowden, Tickle and Naumann that have a positive effect on academic success include diligence, persistence, willingness, motivation, sociability and being self-disciplined.[18]

Most students had similar ideas and opinions regarding factors contributing to their academic success. It was clear that students understood they were responsible for their own success, as mentioned by Bergey *et al.*[19]. Their roles included adequate planning, working hard daily, being diligent, asking questions or seeking advice, preparing for class and revising notes and attending classes. Peer support and mentoring also emerged as a key driver to enhance the learning experiences of first-year students in addition to support from lecturers as described by other

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authors.[19-20] Lorenzetti *et al* found that the majority of students who participated in peer support programmes benefited from these programmes, not only academically but also socially, psychologically and career wise.[21] These active learning methods help to improve the generic skills of students to better prepare them for their future careers.

Key areas that determine a satisfactory learning experience include interacting with lecturers and student peers, quality of teaching and training, lifestyle and university environment, having family or friends who can provide emotional support and assist with challenges around finances, transport and study skills relieves pressure.[12,20] This is in accordance with Bosman, who stated that succeeding academically cannot be done without support from families, friends and the academic institution.[22] By recognising and understanding the factors that contribute to first-year students' learning experiences, universities can better improve the quality of higher education for their students. An understanding of these factors can also help first-year students to better adapt to the university environment.

CONCLUSION

Many students had experienced the transition from high school to university as difficult suggesting that they were not adequately prepared for the workload at tertiary level. Besides the major concern of funding from most students, other factors contributing to students' challenges included transport and accommodation. The participants requested they be assisted in time management and study skills, coping mechanisms to deal with a demanding workload and having access to an educational psychologist.

RECOMMENDATIONS

The university could set up different initiatives, ranging from introductory courses on approaches to learning to activities targeted to engaging first-year students with peers and staff. These could include student orientation programmes and welcome week activities such as rag. Also include first-year learning communities such as academic mentoring and open walk-ins to institution support centres. And these activities could be done not only at the beginning of the year, but perhaps again in the mid-year period.

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CPD questionnaire on page 280

The Continuing Professional Development (CPD) section provides for twenty general questions and five ethics questions. The section provides members with a valuable source of CPD points whilst also achieving the objective of CPD, to assure continuing education. The importance of continuing professional development should not be underestimated, it is a career-long obligation for practicing professionals.

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Measuring tongue strength in adults after partial glossectomy: a review

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ABSTRACT

Objectives

The purpose of this study is to present a scoping review of the measurements of tongue strength available, particularly in adult patients, following partial glossectomy. The subsequent impact on functionality and quality of life were also explored.

Materials and methods

This study used a scoping review and the study selection comprised two stages of screening: the review of the title and abstract followed by a full-text review. During the first stage of screening, the title and abstracts of all retrieved references were reviewed against the predetermined inclusion criteria. In the second stage of screening, all studies were reviewed at full-text level, utilising the Full-Text Screening Relevance measure. A total of 20 articles were reviewed as they met the inclusion criteria

Results

The study found that subjective and quality-of-life measures may still be useful in measuring tongue strength in developing contexts as they closely approximate objective measures and are reliable as an interim measure. However, there is still a need for the development of other objective measures, should funding be available.

Keywords

Swallowing, dysphagia, tongue, oral pathology, mouth, cancer, head and neck

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INTRODUCTION

The tongue is a vital muscle required for various oro-motor functions specifically for the oral preparatory phase of swallowing as well as the swallow trigger used to initiate the pharyngeal phase of swallowing. The tongue provides the medium through which speech is produced, as its swift yet well co-ordinated movements produce the complex sounds required for language production.[1] Those with cancer involving the tongue undergo aggressive surgery and multiple treatment regimens in an attempt to optimise patient survival[1]. This may include a complete or partial removal of the tongue tissue, known as a glossectomy[1]. Such procedures result in reduced tongue strength causing dysphagia, and difficulties with articulation and fluent speech production. This, in conjunction with the impact on patients' physical appearance, greatly impacts on psychosocial and emotional wellbeing[1].

Those suffering from oral cancer experience life-altering deficits that greatly affect their quality of life (QoL) mostly due to the treatment effects on the tongue, jaw, throat and salivary glands.[2] QoL indicators have become increasingly important in patient treatment, given the positive change in life expectancy and road to recovery after treatment.[3] This is therefore an important component in treatment planning and the overall success of treatment.[4] The purpose of this study is to present a scoping review of the available measurements of tongue strength in adult patients following partial glossectomy. The subsequent impact on functionality and QoL was also explored.

MATERIALS AND METHODS

A scoping review was the most appropriate method as it assesses the extent of literature available on a specific topic with an analysis of its importance.[5] It is exploratory in nature, especially when not much is known about the area of study, and is useful to systematically map the evidence, explain key concepts and findings, address knowledge gaps, and develop further areas for future research.[5] The methodological framework is a tool that provides a structured and practical approach for the researcher through a step-by-step process.[6,7,8] The seminal work by Arksey and O'Malley[9] was used in this review and was refined by Levac and Colleagues[10] as well as the Joanna Briggs Institute (JBI).[8] The final step of consultation was not considered in this review; thus, only five steps of the framework were used which included finding and selecting the relevant studies, and charting and reporting the results. The review was done over a period of six months

SAMPLE

According to the literature the search strategy for a scoping review should be comprehensive in order to identify all literature specified by the inclusion criteria.[9] A three-step search strategy was employed to identify research

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studies, which included (i) electronic database search for peer-reviewed studies (ii) Grey Literature search to identify available or ongoing systematic reviews, clinical trials and theses and dissertations and (iii) ancestry searching of included studies utilising snowball sampling.[10] The inclusion and exclusion criteria used the "PCC" (Population [or participants]/Concept/Context) guide recommended by the JBI[10,11] to identify the main concepts and inform the search strategy. The PCC framework also provided a clear context for the research review and assisted in aligning the title, review question and the criteria for inclusion.[5] This also included a list of the articles from the databases used, namely Google Scholar, Scopus® and PubMed® (using medical subject headings/MeSH terms). The same search terms listed above were utilised. For certain databases, Boolean operators, truncation and wildcards were used with the most common being "AND" or "OR". A multipronged strategy was used to avoid potential bias.[11] The authors wanted articles specifically pertaining to tongue strength and, hence, Boolean operators were not used on all databases as this would have created an overlap of articles.

The following search terms and search strings were used:

- "IOPI and glossectomy"
- "Iowa Oral Performance Instrument and glossectomy"
- "Tongue strength after glossectomy"
- "Tongue strength measurement"
- "Tongue strength instrument"
- "SwallowSTRONG"
- "JMS"
- "Oropress"
- "Tongue-o-meter"

A total of 1,863 records were identified and after the screening process 74 were assessed for eligibility and, finally, 20 articles met the study inclusion criteria. The exclusion criteria were articles that were not in English.

Pilot

Piloting was done during the screening phase as noted above and consisted of two distinct stages: (1) the pre-inclusion stage and (2) a post-inclusion stage. The pre-inclusion stage involved (i) piloting the search terms within databases and (ii) piloting of the abstract and full-text screening tools. The post-inclusion stage involved (i) obtaining a purposive sample from the total number of included studies to pilot up to the synthesis stage and (ii) extracting data from the sample using the data extraction tool. After the pilot was completed, the decision was made to include subjective measures and quality-of-life measures. This led to an adjustment of the search terms to include these variables, and the data extraction sheet was amended to include the additional objectives. The search strategy used was a scoping review.

Study selection within the review process comprised two stages of screening: (i) review of the title and abstract and (ii) full-text review.[12] During the first stage of screening, the title and abstracts of all retrieved references were reviewed against the pre-determined inclusion criteria.[12] To streamline the first stage of study selection, a simple tool was developed to assist screening of study titles and abstracts. This made it possible to determine the eligibility for inclusion. The title and abstract review were conducted using Microsoft Excel. Each reviewer was required to indicate "YES", "NO" or "CAN'T TELL" related to the inclusion and exclusion criteria. The following questions based on the inclusion criteria for the review were included:

- Does the abstract report on tongue strength and partial glossectomy?
- Does the abstract report on adults?
- Does the abstract report that qualitative, quantitative or mixed research design was employed?
- Is the abstract published in English?

If there was a "NO" to any of the questions, the study was not included. The article was included for full-text screening if the reviewers indicated a "YES". For the "CAN'T TELL" option the articles were then included for further full-text screening. Disagreements between the seven independent reviewers were then discussed during a meeting.

In the second stage of screening, all included studies were reviewed at full-text level, with each reviewer independently utilising the Full-Text Screening Relevance when answering the same set of questions, to determine the applicability of the contents of the full-text to the inclusion/exclusion criteria.[13]

Compliance with ethical standards

The study did not involve human participants as it was a review of the literature available. There was no conflict of interest. Permission to conduct the research was obtained from the Wits University Human Research Ethics Committee (Wits HREC) prior to commencing with the study.

RESULTS

Demographic information

Fifty percent (n=10; N=20) of the studies reviewed were conducted during the period from 2016 to 2021. Thirty-five percent were conducted in Europe (n=7; N=20) and 65% (n=13; N=20) were in Asia and North America. No studies were conducted on the African continent. Twenty-five percent (n=5; N=20) of reviewed studies were conducted retrospectively through record reviews while 20% (n=4; N=20) used a cross-sectional research method. A clinical trial was conducted in only one of the studies and this involved a single case experimental design.

Data analysis

Descriptive statistics was used for subsequent analysis, as recommended by Peters and Colleagues.[13,15] The data was represented using frequency counts and percentages, as well as summarising the data in tables and figures for analysis purposes. Content analysis was conducted to identify themes or concepts that emerged from the studies that were reviewed. Once the conceptual analysis was done, the data was coded into the following categories: "objective measures", "subjective measures", "quality-of-life measures" and "effects of partial glossectomy on tongue function". According to Bengsston[16], while content analysis is used mainly in qualitative design studies, it can also be used to analyse quantitative data. Since all included studies used quantitative methods, content analysis was included as statistical pooling was not possible due to the variability of the data found.

Merely 20% (n=4) of the studies used objective measures to assess tongue strength. These included the Iowa Oral Performance Instrument (IOPA) (n=2) and the JMS/

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handy probe (Japan) (n=2).[17,18,19] The other 80% (n=16) of studies reported on subjective measures and other forms of establishing tongue strength. Studies did not include measurements of tongue strength pre- and post-surgery or therapy, rendering it difficult to draw conclusions regarding the changes in tongue strength over time. Various measures were used to assess speech articulation and swallow function and, subjectively, tongue strength. This included (but was not limited to) the Assessment of Intelligibility of Dysarthric Speech (AsIDS), the Frenchay Assessment of Dysarthria, Speech intelligibility assessment, the MD Andersen Dysphagia Inventory (MDADI) questionnaire and the Percentage Consonant Correct (PCC).[14,20,21] Swallowing was studied objectively using Fibreoptic Evaluation of Swallowing (FEES) and videofluoroscopy (VFS).[5]

The most common quality-of-life questionnaire mentioned was the European Organization for Research and Treatment of Cancer (EORTC) Questionnaire.[22] A Japanese version of the EORTC, the QLQ-C30 version 3.0 and QLQ-H&N35, were also mentioned. Another common scale was the University of Washington Quality of Life Questionnaire (UWQoL). A Finnish translation of the original version of the University Of Washington Quality Of Life Questionnaire (UWQOL) was also noted. Other scales included the Functional Assessment of Cancer Therapy-Head and Neck (FACT-H&N) and the Functional Oral Intake Scale. These scales all addressed the effects of tongue strength difficulties by exploring common themes in different ways. However, none of these was objective and relied primarily on patients' perceptions of their own limitations.

DISCUSSION

The reduction in tongue strength following partial glossectomy can lead to an increase in vulnerability to dysphagia, which in turn has been associated with further medical complications such as dehydration, malnutrition, aspiration pneumonia and, in severe cases, death.[23] The speech therapist plays a vital role in assessing for the safety of oral intake in order to prevent aspiration. During the assessment it is necessary to take into account the functionality of the tongue in terms of strength and range of movement, and how this may contribute to an oral phase of dysphagia. Together with the anatomical changes, the overall change in QoL must be considered, especially in patients who have undergone a glossectomy.[24,25]

Tongue pressure, precise articulation, speech intelligibility and level of food tolerated has been shown to decrease with the type of glossectomy.[26,27,28] Glossectomy has been linked to changes in the oral phase of swallowing and the consistency of food that can be tolerated. Nutritional monitoring was necessary in most patients in the studies reviewed and malnutrition was evident in about a quarter of patients, chiefly marasmus.[29] A positive correlation between swallowing and oral intake was found in relation to speech changes, demonstrating that the greater the change in food intake, the greater the speech changes. The most common speech disorders were distortion and misarticulations.[30] Intelligibility was not found to be a sensitive measure of speech change, but a study by Blyth and Colleagues[31] demonstrated considerable change in percentage of consonants correct for treated phonemes. Participants, however, demonstrated a reduced tongue range of movement using the Frenchay tool. These showed no improvement following the articulation therapy protocol.[32] The site at which the cancer was present and the patients' gender had no significant effect on the outcomes of therapy.[31]

The reviewed studies revealed the negative impact that reduced tongue strength had on both the swallowing and QoL of patients. A study by Halczy-Kowalik and Colleagues[33] revealed decreased tongue mass, restricted movement of the tongue and epiglottis, and lax oral fissure during VFS evaluations for swallowing. Another study indicated impairment of the swallowing sequence both for the oral and pharyngeal phases following partial glossectomy.[34] In most studies, swallowing symptoms were worse in the first month after surgery with significant improvement by the third month after surgery.[35] Fifty-one percent of patients in a study by García-Peris and Colleagues[26] stated that their QoL suffered greatly due to dysphagia, thus illustrating that the impairments in swallowing negatively impacted on QoL. Patients had a median follow-up of nearly three years post glossectomy. In the study by Kazi and Colleagues[5], there was no significant influence of "time since treatment" on swallowing function. Among patients who had long-term follow-ups, their subjective analysis of swallowing and articulation function revealed that they viewed their tongue function as acceptable after partial glossectomy. This illustrates that in formalised studies, no specific objective measurements were used to evaluate the tongue strength over time, and instead subjective reports and the correlation between tongue strength and dysphagia were used as indicators.

The Iowa Oral Performance Instrument (IOPI), a validated measurement device, is the most widely used tool for measuring tongue strength objectively. However, it is not affordable to all patients and practitioners due to budgetary and economical restraints.[33] In South Africa, the IOPI device cannot be easily imported into the country and patients often have limitations in resources. As such, other subjective and QoL measures need to be used to aid in determining tongue strength. Studies have shown a proportional correlation between oral function performance and patient self-perceived QoL measures.[26] It is complex to assess QoL given the multitude of variables that can impact on patients' self-perception, and thus a combination of measures including standardised and objective measures is necessary.[36] Several QoL scales exist in the literature including (but not limited to) the Speech Handicap index, Sydney Swallow questionnaire[3], University of Washington Quality of life questionnaire (UWQOL) and the EORTC.[22]

The EORTC questionnaire and the PSS (Performance Status Scale) are used as measures of QoL for cancer patients but are not specific to tongue strength post glossectomy.[22] The majority of studies used EORTC as a measure of QoL in cancer patients. However, better suited for patients post glossectomy is the MD Anderson Dysphagia Inventory (MDADI) as it assesses the QoL of patients with head and neck cancers.[36] The MDADI questionnaire assesses patients' views of their swallowing ability following treatment, and how the change in swallowing function affects QoL.[36] Swallowing function is not only a QoL measure, as in several studies it is used as a measure of tongue strength. In the study by Halczy-Kowalik and Colleagues[33] the primary measurement for tongue strength was swallowing efficacy

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which was assessed using a 100-point scale during VFS analysis of swallowing. Grammatica and Colleagues[37] measured swallowing function using FEES and VFS, testing various food consistencies. Hence, swallowing function can be assessed endoscopically, radiologically and by questionnaire. Thus, in countries where tongue pressure measurement devices are unavailable, a good alternative is measuring swallow function especially since this complex act requires good tongue strength and range of motion.

The articles reviewed are varied in the parameters used to measure tongue strength such that a standard baseline of tongue strength post glossectomy cannot be made. However, the main parameters included tongue pressure and measurements of dysphagia, with a focus on swallowing function. A cost-effective measurement of dysphagia is the MDADI questionnaire. Other parameters of tongue strength include salivary flow assessment, tongue motility assessment, speech intelligibility and articulation. However, speech intelligibility can be open to variation and thus another cost-effective measure for evaluating tongue strength is speech articulation, by evaluating the production of specific sounds[25]. This study aimed to describe the available objective, subjective and quality-of-life measurements of tongue strength in adults after a partial glossectomy. The findings suggest that there are limited instances whereby objective measures are used to determine tongue strength in most contexts. Instead, clinicians have had to rely on subjective measures and other clinical factors such as the presence of dysphagia and the accuracy of speech production.

Limitations of the study

A frequently reported limitation of review studies is the inherent likelihood that a review may have missed some literature. This could be attributed to the database selection and the search period, as searching a greater number of databases over a longer search period may have resulted in more studies being identified. However, a saturation point must be established and, nonetheless, the possibility of missing studies due to the above-mentioned limitation cannot be ruled out. Scoping reviews are not exhaustive[14], thus creating a challenge for researchers since relevant articles may not be included in the study, which will create a gap in the literature. The studies utilised for the review were in English only, and this could have introduced a language bias. Due to the disparity of the quantitative data in the included studies, statistical numerical analysis was not possible, and results were presented in a narrative form accompanied by graphical representation as recommended by JBI.

In terms of the studies themselves, a significant limitation was that most studies evaluated tongue strength subjectively via interviews or questionnaires, rather than relying on objective methods. This may have resulted in inaccuracies in the actual evaluation of the strength of the tongue, causing false conclusions to be drawn. Therefore, it is preferable to have at least one objective method utilised to confirm the findings of subjective measures and while this may not always be feasible, it has a significant impact on assessment and treatment procedures. Objective measures may include handheld instruments such as the IOPI and, if unavailable, then standardised measures to evaluate disorders related to reduced tongue strength should be used. These include FEES or VFS to objectively measure dysphagia or standardised articulation tests for speech production. Most studies had a sample size of less than 50 participants, thus reducing generalisability and increasing the margin of error. Future studies should then aim to have larger sample sizes to ensure that data is more representative of a wider population.

There was occasionally a disparity in the ages of the healthy patients who were used as a control in the study and the patients who had undergone a glossectomy. As mentioned earlier in the review, a change in total swallowing function and tongue strength during swallowing becomes apparent as patients get older.[26] Thus, it is important to ensure that the age range of the control group matches that of the experimental group.

CONCLUSION

There was a significant relationship between improved QoL, reduced dysphagia severity and increase in Functional Oral Intake Scale scores.[37] As such, subjective and QoL measures may be useful in evaluating tongue strength within developing and underresourced contexts. There is growing evidence that tongue strengthening exercises can improve tongue strength and swallowing function in both healthy and dysphagic patients[38]; however, additional insight is needed to develop effective and efficient tongue strengthening exercise procedures and protocols. This can only be done if there is a standardised and reliable method of assessing tongue strength that does not rely on expensive and hard to obtain objective measures, nor is reliant on subjective measures which are not always repeatable. Therapeutic intervention for those suffering from decreased tongue strength can only be successful if clinicians have access to a measurable value of tongue strength prior to treatment, during treatment and post treatment. This may help to further the field in developing therapeutic goals geared towards improving tongue strength in those post glossectomy.

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Knowledge, attitude and perceptions of dental professionals on patients seeking oral health care from traditional healers in KwaZulu-Natal, South Africa

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ABSTRACT

Background

The general and oral healthcare needs of communities far exceed the capacity of the current public health system of South Africa (SA). This results in patients deferring treatment or seeking alternative measures in the form of the traditional health practice. It is important for dental professionals in the health system to be aware of such oral health care seeking behaviour within rural communities to initiate joint corporate oral health education programmes and referral systems that resonate with these communities.

Aims and objectives

The study aimed to explore the knowledge, attitude and perceptions of dental professionals (16 dentists, 25 dental therapists, 4 oral hygienists and 3 dental assistants) regarding patients seeking oral health care from traditional healers.

Methods

This was an exploratory, cross-sectional study that evaluated dental professionals' knowledge, attitude and perceptions on patients seeking oral health care from traditional healers. A purposive sampling technique using specific inclusion criteria was used to select 48 qualified dental professionals (oral hygienists, dentists, dental assistants and dental therapists) practising in rural KwaZulu-Natal. A self-administered questionnaire was used for data collection. Data related to sociodemographic variables and knowledge, attitudes and perceptions of dental professionals were recorded.

Results

Most (77.1%) dental professionals were aware that their patients were seeking oral health care from traditional healers. They further maintained that the traditional health practice included ideas and methods from which the oral health fraternity could benefit.

Conclusion

This study revealed most of the dental professionals in rural Kwa-Zulu Natal have encountered patients who have consulted traditional health practitioners for oral health care. The dental personnel were accepting of traditional healers and believed that traditional healers could contribute positively to rural oral health care.

Keywords

Oral health care, oral health professionals, oral diseases, dental professionals, rural communities, traditional health practice, traditional healers.

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   research topic, data collection, data analysis, article writing
2. Ilana Moodley 30%
   research supervision, article writing, editing
3. Mogie Reddy 30%
   research supervision, article writing, editing

INTRODUCTION

The current health system in SA continues to be challenged to meet the healthcare demands of its nation adequately, especially in KZN with an existing quadruple disease burden of HIV/AIDS, tuberculosis, chronic illnesses and injuries.[3] In addition, SA has a shortage and maldistribution of health workers in the public sector,[4] with more healthcare workers in urban than in rural areas.[5] KZN has a population of 11.5 million,[6] of which only 16% have medical insurance, allowing them access to the private sector health services, leaving 84% of the population dependent on the underresourced public health sector.[7] Dental caries remains one of the most prevalent oral health diseases. Most dental professionals are employed in the private sector even though most of the population access the public sector which only offers basic oral health care.[8] Consequently, many defer treatment for their dental problems or seek alternate forms of care such as traditional healers to treat their oral diseases. In developing countries approximately 80% of people rely on traditional medicine (TM) [9, 10, 11] for their healthcare needs.

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Table 1 Number of participants per district municipality

District municipality	Dentists (n)	Dental therapists (n)	Oral hygienists (n)	Dental assistants (n)
Umzinyathi	2	2	1	
Ethekwini metro	2	3		
Umgungundlovu		3	1	
Umkhanyakude	2	2	1	
Harry Gwala	2	3		
Uthukela	2	1		1
ILembe	3			
King Cetshwayo		4		
Zululand	2	2		
Amajuba		4		
Ugu	1	1	1	2
Total	**n=16**	**n=25**	**n=4**	**n=3**

Traditional healers have no formal medical training but are recognised as competent in their communities as they are easily accessible, affordable and culturally and socially acceptable.[12] Thus, most people in rural areas seek treatment from traditional healers, more often for oral diseases, than from dental professionals due to accessibility and affordability. It is important for dental professionals in the health system to be aware of such oral health care seeking behaviour within rural communities because healthcare workers are bound to attend to patients presenting with advanced oral disease, who have first sought assistance from traditional healers. This study aimed to determine the knowledge, attitude and perceptions of dental professionals on patients seeking oral health care from traditional healers in KZN, South Africa.

METHODOLOGY

Study design

This study was conducted in the year 2020, an exploratory cross-sectional study design to determine the knowledge, attitude and perceptions of dental professionals (oral hygienists, dentists, dental therapists and dental assistants) on patients seeking the traditional health practice for oral health care. This study is part of a bigger study which also explored the views of traditional healers on oral health care and the opinions of community members seeking dental treatment from traditional healers. Ethical approval was obtained from the Human and Social Sciences Research Ethics Committee of the University of KwaZulu-Natal (HSSREC/00000951/2020) and the KZN Department of Health (KZ_202003_007) to commence with the study.

Setting

The study was conducted in the 11 districts of the province of KZN focusing on the rural local municipalities. The district municipalities were: Amajuba, Ethekwini, Harry Gwala, ILembe, King Cetshwayo, Ugu, Umgungundlovu, Umkhanyakude, Umzinyathi, Uthukela and Zululand.

Sampling and selection criteria

A purposive sampling technique using specific inclusion criteria was used to select 55 dental professionals from 11 district municipalities of KZN. The participants were sampled, assuming a population size of 302 dental professionals in the province.[13] These criteria included obtaining consent from the participants and their institutions, location (employed in rural KZN), expertise/qualification (Certificate, Diploma or Bachelor's degree in Dental Assisting, Oral Hygiene, Dental Therapy and Dental Surgery) and employment status (state or private sector or both). Table 1 & 2 depict the participants according to the specific inclusion criteria.

Table 2 Stratification by sector

	Employment status			
Qualification	**Employed by state**	**Self-employed**	**Employed in private sector**	**Employed by private and public sector**
Dentist	4	10	1	1
Dental therapist	15	8	2	
Oral hygienist	3		1	
Dental assistant	3			
Total	**25**	**18**	**4**	**1**

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Table 3 Qualification of participants

Qualification	Gender		Qualification level		
	Male	Female	Certificate	Diploma	Bachelors' degree
Dentist	13	3			16
Dental therapist	11	14			25
Oral hygienist		4		4	
Dental assistant	1	2	3		

Data collection tool

Informed consent was obtained from all participants. An online questionnaire using QuestionPro was used for those participants who had internet access. Links were emailed to those participants who were registered with the South African Dental Therapy Association (SADTA). Self-administered questionnaires were delivered by the researcher to those participants who were not registered with SADTA and had no internet access. The complete questionnaires were collected a week later.

The questions were close ended and explored the knowledge, attitude and perceptions of dental professionals on the traditional health practice's intervention in oral health care. The questions also probed the dental professionals' experiences with their patients seeking oral health care in the traditional health practice and their thoughts on whether or not traditional healers can contribute positively to oral health care.

Pilot study

A pilot study was not conducted due to the lockdown restrictions imposed by the COVID-19 pandemic.

Data analysis

Quantitative data was entered into an Excel spreadsheet and analysed with the Statistical Package for Social Sciences (SPSS) software version 26.0. The outcomes of the variables that measured the knowledge, attitude and perception s of dental professionals were presented by descriptive analysis using cross-tabulations, graphs and other figures.

RESULTS

The results of this study are presented in two sections, namely demographics of participants and the participants' responses on knowledge, attitude and perceptions on patients seeking oral health care from the conventional and traditional health practices; to address the objectives of the study.

The answers employed the Likert scale format. Overall knowledge scores were labelled as good knowledge (participants who answered more than 50% knowledge items) or limited knowledge (participants who answered less than 50%).

Demographic data

Of the targeted 55 participants; 48 participated, yielding

Table 4 Number of participants per district

District	Umzinyathi	5	10.4%
	Ethekwini metro	5	10.4%
	Ugu	5	10.4%
	Umgungundlovu	4	8.3%
	Umkhanyakude	5	10.4%
	Harry Gwala	5	10.4%
	Uthukela	4	8.3%
	ILembe	3	6.3%
	King Cetshwayo	4	8.3%
	Zululand	4	8.3%
	Amajuba	4	8.3%
Religion	Christian	36	75%
	Islam	3	6.3%
	Hindu	3	6.3%
	Africanist	5	10.4%
	Shembe	1	2.1%

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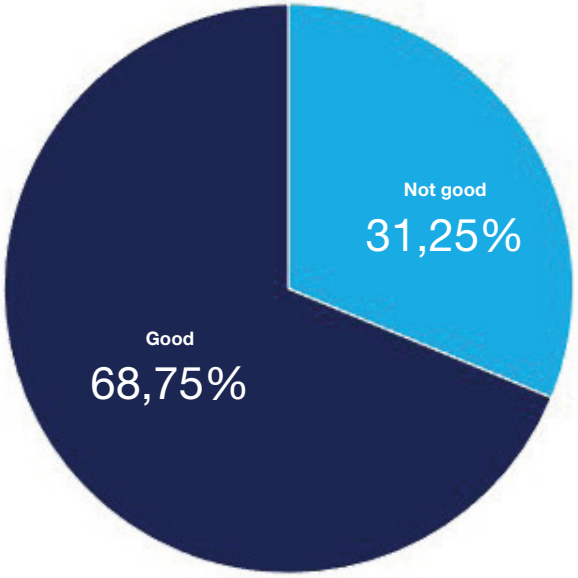

Figure 1 Knowledge level of dental professionals on the traditional health practice

an 87% response rate. While this was a good response rate, lLembe had the least participants with only 6% (n=3) responding. Overall, the ratio of males to females was approximately 5:7 41.7% (n=20): 58.3% (n=28). The participants' qualification are summarised in Table 3.

More than half the participants 52.1% (n=25) were dental therapists, 33.3% (n=16) dentists, 8.3% (n=4) oral hygienists and 6.3% (n=3) dental assistants.

While 52.1% (n=25) of the respondents were employed by the KZN Department of Health, 39.6% (n=19) were self-employed, 6.3% (n=3) employed in private practice and 2.1% (n=1) were employed by both public and private practice.

The number of participants per district is summarised in Table 4 as well as their religious affiliations. lLembe district had the least participants 6.3% (n=3). Most participants 75% (n=36) were Christian.

PARTICIPANTS' RESPONSES

Knowledge of dental professionals regarding the traditional health practice

Generally, participants indicated significant levels of knowledge regarding the traditional health practice. Figure 1 represents the knowledge levels of all the participants regarding the traditional health practice's interventions in oral health.

The majority (68.75%) of the participants displayed good knowledge while 31.25% showed limited knowledge.

This was further supported by more than half the respondents who were aware that patients consult the traditional health practice for oral diseases. Table 5 depicts the knowledge of dental professionals on traditional health practice and oral health care.

Most participants 58.4% (n=28) accepted the traditional health practice, while 22.9% did not and 18.8% (n=9) were neutral. Although most participants 77.1% (n=37) indicated to have come across patients who have sought traditional health practice for oral health care, 14.6% (n=7) disagreed and 8.3% (n=4) were neutral. In response to spiritual forces causing oral diseases, most participants 43.7% (n=21) disagreed, 31.3% (n=15) were neutral and 25% (n=12) agreed.

Regarding physical forces being the cause of oral diseases, most of the respondents 73% (n=35) agreed, 20.8% (n=10) disagreed and 6.3% (n=3) were neutral. When asked whether physical forces were the only cause of oral health related conditions 64.6% (n=31) disagreed meaning that they believed there were other factors which could cause oral diseases, 20.8% (n=10) were neutral and 14.6% (n=7) agreed.

Participants' responses from Umgungundlovu, Umkhanyakude and Amajuba district municipalities indicated 100% good knowledge compared with King Cetshwayo and Uthukela district municipalities with the least knowledge (25%).

Table 5 Dental professionals' responses on knowledge

Knowledge	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
	n	%	n	%	n	%	n	%	n	%
I accept the traditional health practice	5	10.4%	6	12.5%	9	18.8%	25	52.1%	3	6.3%
I often come across patients who have visited a Traditional Health Practitioner (THP)	3	6.3%	4	8.3%	4	8.3%	33	68.8%	4	8.3%
Oral health related conditions can be caused by spiritual forces	11	22.9%	10	20.8%	15	31.3%	11	22.9%	1	2.1%
Oral health related conditions can be caused by physical forces	5	10.4%	5	10.4%	3	6.3%	33	68.8%	2	4.2%
Oral health related conditions are only caused by physical forces	7	14.6%	24	50%	10	20.8%	5	10.4%	2	4.2%

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Table 6 Participants' responses on attitude

Attitude	Strongly disagreed		Disagreed		Neutral		Agree		Strongly agree	
	N	%	N	%	N	%	N	%	N	%
Oral health related conditions can only be healed through the conventional health practice	11	22.9 %	18	37.6%	6	12.5%	12	25%	1	2.1%
Dental professionals are the only body capable of treating oral health related conditions	6	12.5%	18	37.5%	5	10.4%	14	29.2%	5	10.4%
I am comfortable with my patients seeing THPs for oral health related conditions	3	6.3%	13	27.1%	8	16.7%	22	45.8%	2	4.2%
It is important for dental professionals to consider the patients' belief system at all times	0	0.0%	4	8.3%	4	8.3%	25	52.1%	15	31.3%

Attitude of dental professionals

This segment reports on participants' attitudes on patients seeking oral health care from traditional healers labelled as Traditional Health Practitioners (THPs) depicted in Table 6.

In response to oral diseases being healed only through conventional health practice 60.5% (n=29) of dental professionals disagreed, 27.1% (n=13) agreed and 12.5% (n=6) were neutral. In response to whether dental professionals are capable of treating oral health related conditions, half the respondents 50% (n=24) disagreed, 39.6% (n=19) agreed and 10.4% (n=5) were neutral.

As to participants' response to whether they were comfortable with their patients seeing traditional healers for oral health related conditions, 50% (n=24) agreed, 33.4% (n=16) disagreed and 16.7% (n=8) were neutral. An overwhelming 83.4% (n=40) responded it was important to consider the patients' belief system at all times, while 8.3% (n=4) were neutral and the remaining 8.3% (n=4) disagreed.

Perceptions of dental professionals

This section reports the participants' responses on oral health care, the quality of life and involvement of the traditional health practice.

Based on how the respondents perceived oral health related quality of life and the traditional health practice, the majority 97.9% (n=47) agreed that oral health had an effect on the overall quality of life. In relation to the quality of life, an overwhelming 95.9% (n=46) indicated that it was important to view patients holistically instead of just identifying oral anomalies. More than half the participants (60.4%. n=29) indicated that it was not important to share the patient's information with their family, 23% (n=11) said it was important and 16.7% (n=8) were neutral.

The respondents were all qualified dental personnel but 68.8% (n=33) said they have identified oral anomalies beyond their understanding, 20.9% (n=10) disagreed and 10.4% (n=5) were neutral. More than half the participants 56.3% (n=27) said the traditional health practice included ideas and methods that the oral health fraternity could benefit from, 31.3% (n=15) were neutral and 12.5% (n=6) disagreed. The majority of the respondents 81.3% (n=39) were willing to learn more about the traditional health practice and how traditional healers could play a role in strengthening oral health, thus improving the quality of life.

DISCUSSION

This study analysed the knowledge, attitude and perceptions of dental professionals regarding patients consulting traditional healers for oral health care. Most participants agreed that they have encountered patients who have consulted traditional healers for oral health care. This study findings is similar to research conducted by the WHO which found that 80% of South Africans rely on traditional medicine for their health care needs.[14] Some of the reasons for this include that dental treatment is expensive and dental care seems more accessible to those who can afford it.[15]

All the dental professionals in this study practised in rural KZN, where only 16% of the population are able to afford private dental care[3], leaving 84% of the population dependent on the challenged public health sector for their healthcare needs.[3] These challenges include financial barriers, poor infrastructure and limited resources and services in rural public health facilities.[16] Given the high unemployment rate in most participating district municipalities (Umzinyathi, 57.8%, 50.8% in Umkhanyakude)[17], it is evident that many rural residents cannot afford private dental treatment. The public health facilities appear overburdened: for example, Umkhanyakude – a rural district located in the far northern region of KZN with a population distribution of 689,090 people – has 5 public hospitals, 1 community health centre and 52 primary health clinics. However, there are 254 registered traditional healers.[17,18,19,20,21] This implies that many patients are attending the overburdened public health care facilities[22] and, with traditional healers being more easily accessible, people are inclined to use traditional, complementary and alternative medicine for oral health care.[23]

Other reasons why people consult traditional healers include that they are more accepted than health care providers and their methods are more effective and less invasive as they

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mainly use herbs and medicinal plants.[24] A study in KZN found that about 70% of patients consulted a traditional healer as a first choice for health care, including oral health care and potentially life-threatening conditions.[25] Hence it is important for dental professionals to have an understanding of this type of care when attending to patients in rural communities.

Knowledge of dental professionals

This study showed that participating dental professionals practising in rural communities of KZN have a good knowledge of traditional health practices. Most participants agreed that they have come across patients who have consulted with a traditional healer for oral health related conditions. This study findings is similar to research conducted by the WHO which found that majority South Africans rely on traditional medicine for their healthcare needs.[14]

More than half the participants have accepted the traditional health practice. Research has shown that traditional healers heal or attempt to heal patients solely using religious and spiritual gifts, while some heal with medicinal plants, herbs and concoctions.[26] This contrasts with dental school training in which dental professionals receive rigorous clinical training to obtain the necessary skills to assist patients with diagnosis and management of various oral diseases. By accepting traditional health practice, the participants of this study have demonstrated the importance for dental professionals to adapt to unique cultural landscapes in which they practice and accept the cultural beliefs of the communities they serve. By embracing cultural understanding and knowledge, dental professionals can improve the quality of dental care for all their patients.

The participants in this study were questioned about the different dynamics of the causes of oral diseases. Most of the participants alluded that physical forces were the cause of oral diseases. However, when specifically asked whether physical forces were the only cause of oral diseases, most disagreed meaning they believed that there were other factors which could cause oral diseases. Dental professionals' training is based on sound scientific and evidence-based research, yet almost 65% of them agreed that there may be other forces. This further demonstrates that the study participants show acceptance and respect for cultural beliefs within the communities in which they work. This acceptance and respect can be used as an opportunity for dental professionals to initiate a collaboration with traditional healers to reach a point of mutual understanding in the best interest of the patients they treat. This includes sharing knowledge on aspects of oral care which may require referral to and further management by dental professionals. This is supported by the literature which cites examples that through constructive engagement and developing good relationships between the two practices, traditional healers became actively involved with a TB control programme. In Cape Town, traditional healers were trained to be TB and HIV/AIDS supporters by medical personnel.[27,28]

Attitude of dental personnel

Participants were asked about their attitude towards patients seeking oral health care from traditional healers. Most respondents indicated it is highly important to take into consideration the patients' belief system at all times. This concept affirms previous research which suggests that African spirituality should neither be rejected nor neglected when treating patients, but should be used as a catalyst that facilitates a patients' recovery from illness.[29] Furthermore, spirituality is important as it acts as a tool of hope thus assisting with quick recovery, especially when combined with the conventional health practice.[30] In this study, dental personnel had no issue with patients seeking oral health care from traditional healers as they believed that they are not the only body capable of treating oral diseases. This is also because the dental personnel held the patients' belief system in high regard.

Perceptions of dental professionals

Viewing patients generally instead of just identifying oral anomalies is based on how previous studies have defined oral health. It is often defined as a multifaceted phenomenon which includes the ability to speak, smile, smell, taste, touch, chew, swallow and convey a range of emotions through facial expressions with confidence and without pain, discomfort and disease of the craniofacial complex.[31] When oral diseases manifest, the mouth and face can affect an individual's self-esteem as well as their wellbeing.[32] The participants in this study agreed with this phenomenon as they alluded that oral health had an overall effect and viewing patients holistically was just as important as identifying oral anomalies.

There is no study available reporting on oral diseases and spiritual causes and treatment. However, in the African context it is reported that spiritual causes of illness result in difficult diagnosis and treatment.[33] This study informs that though all the participants were qualified and practising dental professionals most agreed to have identified oral anomalies beyond their understanding, meaning there was a possibility of other causes beside the physiology.

By virtue, human beings have a basic right to choose among several options based on factors suitable for them. Some of these facets include their belief system, preferences, knowledge and perceptions.[34] In health care, previous research has identified gaps in the traditional health practice, resulting in low levels of collaboration between conventional and traditional health practices.[34] A deliberate collaboration should be considered in order to holistically heal the patient. This can be a challenge in oral health care based on former literature identifying numerous loopholes around policy and authorisation for traditional healers in the public health system due to the lack of analytical review.[34] This study showed that most dental personnel were not clouded by this judgement as they believe the oral health fraternity could benefit from ideas and methods of the traditional health practice. They further showed willingness to learn more about the role of traditional healers in oral health care and the quality of life for the benefit of the rural communities they serve.

Relevance of study

This study evaluated the knowledge, attitude and perceptions of dental professionals regarding patients seeking oral health care from traditional healers. The findings of the study will contribute to the body of knowledge on traditional medicine and provide a better understanding and awareness among dental professionals of patients seeking oral health care from THPs. This study can also initiate collaboration between dental professionals and THPs,

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further contributing to the development of referral patterns in improving patient care in rural KZN.

Considering that there is a shortage of alternative oral health research in the traditional health practice at higher learning institutions, this study can be a catalyst for more research on this subject. Research recognises that knowledge does not translate to immediate action; the disparities in this study may be primarily resolved by taking into account the traditional health practice and the patients' belief system. These can be integrated into the community dentistry programme for students, presented in conferences/workshops/seminars for qualified dental personnel and other professional bodies.

Limitation of the study

The study participants were confined to one province, therefore the results cannot be generalised to other provinces. However, this study can still provide insight into the dental professionals' knowledge, attitude and perceptions on patients seeking oral health care from traditional healers in rural communities and be replicated in other provinces. Further research on rural oral health and the role of THPs in oral health care should be expanded upon as it relates to holistic health care in SA.

CONCLUSION

Most dental professionals are aware of patients consulting traditional healers for oral health care. Dental professionals are scientifically trained to manage oral diseases yet are knowledgeable and accepting of the traditional health practice. Additionally, participants were optimistic that traditional healers could play a significant role in the prevention and care of oral health related conditions through collaborative training programmes. Therefore, it is important to initiate joint oral health education programmes and referral systems that resonate with rural communities.

DECLARATION

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Disclaimer

The views presented in the submitted article are solely the authors' own and not an official statement of the institution.

Conflict of interest

The authors declare that they have no personal or financial relationship(s) that may have inappropriately influenced them to write this article.

Ethical consideration

This is outlined in the manuscript.

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Availability of data and materials

The data that supports the findings of this study are available from the corresponding authors upon suitable request.

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Perceptions and preferences for dental specialties among undergraduate students and dental interns in Kenya

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ABSTRACT

Introduction

Uptake of various dental specialties does vary globally. There is scarce information regarding motivations and preferences for various dental specialties in developing countries.

Aims and objectives

This study aimed to determine perceptions, preferences and factors that influence dental specialty choice in Kenya.

Design and methods

This was a cross-sectional study among dental students and dental interns conducted at two dental schools in Kenya. It was a census study that used self-administered questionnaires to collect information.

Results

Most (76%) participants indicated a desire to specialise, more so by Moi University students (82%). The most preferred specialties were maxillofacial surgery, restorative dentistry, prosthodontics and orthodontics. Female respondents reported highest preference for restorative dentistry whereas male respondents reported highest preference for maxillofacial surgery. Perceived financial returns and personal interest were the most important factors influencing choice of specialty. Maxillofacial surgery was perceived to guarantee higher financial returns, whereas dental public health was perceived to have the highest impact to the community. Most participants preferred working in the private sector.

Conclusion

There was a high desire to specialise among participants, especially in maxillofacial surgery and restorative dentistry. Key factors influencing choice of specialty were personal interest and better financial returns.

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Authors' contribution:

	MO Lukandu (%)	LC Koskei (%)	EO Dimba (%)
Conceptualisation	70	20	10
Data curation	40	30	30
Methodology/formal analysis/validation	40	30	30
Project administration	40	20	40
Writing original draft	80	10	10
Writing – review & editing	10	50	40

INTRODUCTION

Dentistry has several areas of specialisation that can be pursued by dentists upon qualification with a first degree.[1,2] With specialised training, dentists gain additional in-depth knowledge and skills to enable them to focus their career on a specific field of dentistry, and to better serve select groups of patients with dental and oral health service needs. Availability of opportunities and uptake of various specialisations in dentistry does vary from one part of the world to another. Perceptions regarding specialisation and factors that influence the desire to specialise also vary from one country to another.[3-5]

In many parts of the world, graduates tend to be influenced more by financial returns, with specialties perceived to bring higher financial returns being the most preferred.[3,6] Other key factors include availability of training opportunities, personal interest, desire to serve a select group of dental patients, dental specialist's quality of life and opportunities for employment.[3,7] Based on these factors and perceptions, dentists make choices to pursue specific specialties that best fulfil their expectations. Those who wish for higher financial returns tend to pursue specialties perceived to have higher incomes such as maxillofacial surgery and orthodontics.[3] Graduates who are more influenced by personal interest and enjoyment of the specialty practice tend to prefer restorative dentistry and prosthodontics, whereas those who wish to have a higher societal impact tend to choose dental public health and general dental practice.

In some western countries such as the US, one factor that greatly influences choice of specialty is the amount of debt accrued during training.[3] In the UK, among major influencing

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factors were the perceived enjoyment in providing the specific specialised care to patients, and gender, where female participants preferred to specialise in pediatric dentistry and special care dentistry whereas males were more likely to pursue orthodontics or oral surgery.[8] In countries such as China and many parts of Africa, key influencing factors tend to be the expected financial returns as well as prestige.[6,9] There are reports of changing trends in factors that influence choice of specialty, where the newer generation of doctors and women tend to favour specialties that allow them more flexible working hours, more time with family and better work-life balance.[10]

Studies in Nigeria and the Congo have reported a high desire to specialise in dentistry, with a preference for maxillofacial surgery, pediatric dentistry and dental public health, and the choice being influenced mainly by economic reasons such as the cost of study.[9,11] In South Africa, orthodontics and oral and maxillofacial surgery have been reported as the most popular specialties among dental students, with a large proportion of students worried about the debt accrued as part of dental studies.[12] There are, however, some specialties as well as career choices that tend to attract less interest across the world, and these include oral radiology, oral pathology and academics and research in dentistry.

Previous studies on perceptions regarding dental specialties and factors that influence choice of dental specialty have mainly been carried out in the developed world, with limited literature on this issue in developing countries such as Kenya. With the rapid population growth and increase in oral diseases in the country, there is an increase in demand for oral health services, including specialised oral health services. The developing world is also increasingly becoming a key source of oral health care workers for the developed world due to increased migration in search of better employment opportunities.[13,14] There is, therefore, a need for more studies looking at perceptions regarding dental specialties and factors that influence choice of dental specialties in Kenya and other developing countries. The purpose of this study was to investigate future plans of dental students and dental interns by exploring their perceptions regarding various dental specialties, their preferred specialties and factors that influenced their choice of specialty.

MATERIALS AND METHODS

This was a cross-sectional study conducted among clinical year dental students (years 4 and 5 of dental training) and newly graduated dentists (dentists on internship training) in Kenya. Currently, Kenya has only two dental schools, one at University of Nairobi and another at Moi University. At the time of this study, there were 124 clinical year dental students and 29 dentists on internship training in the country constituting a study population of 153. All these were eligible to participate since this was a census study.

Ethical approval was granted by the Institutional Research Ethics Committee (IREC, approval number 0002044), based in Eldoret, Kenya. Permission to conduct the study was also granted by the administration of the two dental schools. Information about this study was sent out to all eligible participants through their class and study group representatives, with permission from their school administrations. The purpose of the study was clearly explained to the participants and all those willing to participate were requested to sign consent forms prior to participation in the study. Data was collected by use of a self-administered questionnaire that had no identifying information. Questionnaires contained structured questions with both open ended and closed questions drawn from similar studies in other parts of the world.

The study used a five-point Likert-type scale where the students were asked to indicate their level of agreement with various statements that assessed their plans, preferences and perceptions regarding various dental specialties. For the purpose of this study, the specialty of restorative dentistry was defined as the diagnosis, treatment and prevention of dental conditions that affect natural teeth, whether vital or non-vital, and to restore them in terms of function and aesthetics, whereas prosthodontics was defined as the specialty concerned with the design, fabrication and fitting of artificial replacements for missing teeth and other parts of the mouth.

Ethical considerations, data management and statistical analysis

For ethical reasons, researchers who were tutors did not directly contact their student participants but did so

Table I: Sociodemographic characteristics

Variable	Category	Frequency (N=108)	Percentage
Age	Mean (SD)	24.6 (1.7)	-
Gender	Female	61	56.5
	Male	47	43.5
Training level	Level 4	53	49.1
	Level 5	29	26.8
	Internship	26	24.1
Training institution	Moi University	48	44.9
	University of Nairobi	59	55.1
Parents' occupation	Health sector	5	5.6
	Education sector	21	23.6
	Financial sector	37	41.6
	Farmer	13	14.6
	Other	13	14.6

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Table 2: Preference for various specialties among the respondents

	Institution of training			Gender		
	Moi University (N=45)	University of Nairobi (N=53)	Total (98)	Female (N=56)	Male (N=43)	Total (N=99)
Maxillofacial Surgery	8	6	14	3	11	14
Restorative Dentistry	10	3	13	13	1	14
Prosthodontics	6	8	14	9	5	14
Orthodontics	2	8	10	4	6	10
Endodontics	5	4	9	4	5	9
Oral Surgery	2	5	7	4	3	7
Dental Public Health	1	5	6	5	1	6
General Dental Practice	4	2	6	2	4	6
Periodontology	0	5	5	4	1	5
Pediatric Dentistry	1	3	4	4	0	4
Oral Pathology	2	2	4	1	3	4
Academics and Research	3	1	4	3	1	4
Oral Radiology	1	1	2	0	2	2

only through research assistants. Questionnaires were distributed to the participants physically through their class representatives. On completion, they were collected from participants and handed over to the researchers or their assistants.

All questionnaires were checked for completeness, particularly to assess the extent of missing values. Data were manually sorted, entered and stored electronically in the software SPSS (Statistical Package of Social Sciences version 22, IBM-SPSS, IL, USA). Measures to ensure data validity included entry of data by one researcher, and verification of the entries by a different researcher, checking entered data against predefined codes and rules, cleansing of data and correction of wrong or irrelevant entries. In line with objectives of the study, only descriptive statistics were conducted during analysis. Age of participants was summarised as means and standard deviations. Gender, institution of training and level of training was summarised in proportions. Variables regarding preferences or perceptions on various specialties were summarised in form of frequencies. Data were presented in form of tables and bar graphs.

RESULTS

Sociodemographic information

A total of 108 out of a potential 153 dental students and interns participated in the study, giving a response rate of about 71%. Most participants were female, and their age ranged from 23 to 32 years, with a mean of 24.6 years. Most participants were from the University of Nairobi, and the majority had parents working within the financial sector (Table 1).

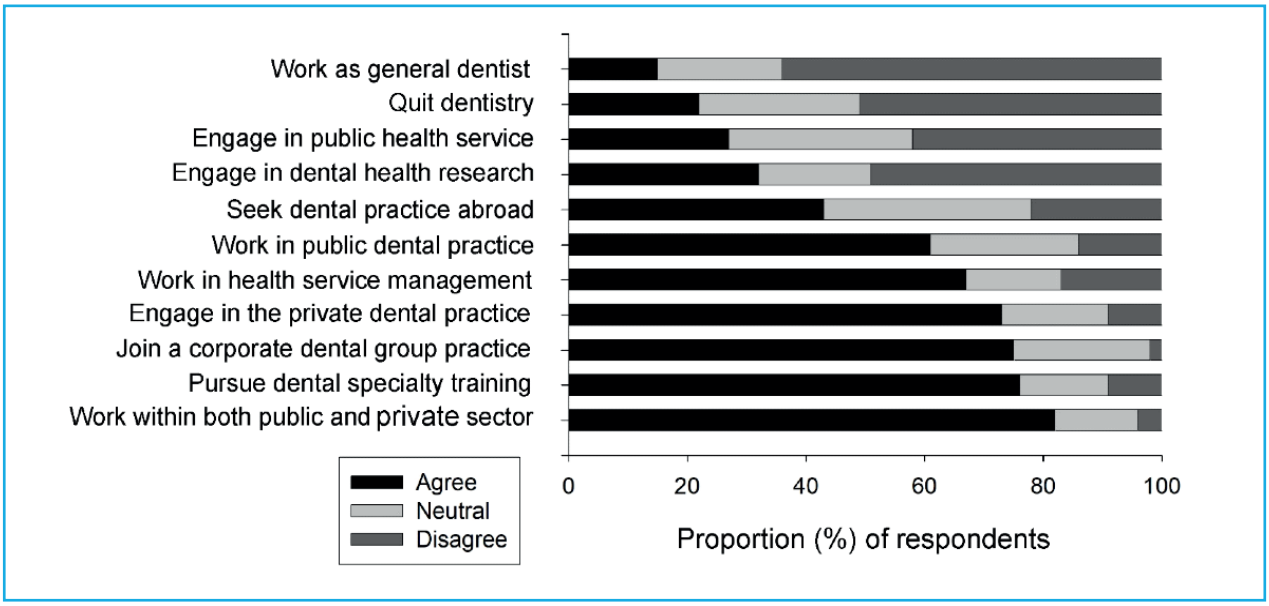

Figure 1: Most preferred future plans for the respondents

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Table 3: Perception regarding specialties that had the highest financial returns, quality of life and impact on humanity

Specialty	Doctor's financial returns N=93	Doctor's quality of life N=78	Patient's quality of life N=84	Impact on the nation N=86	Impact on humanity N=88
Maxillofacial Surgery	31	13	16	19	4
Restorative Dentistry	7	8	10	7	4
Prosthodontics	3	9	10	9	13
Orthodontics	30	19	2	0	0
Endodontics	9	6	4	4	3
Oral Surgery	4	3	10	12	9
Dental Public Health	1	6	5	20	30
General Dental Practice	0	6	7	5	16
Periodontology	4	2	7	0	1
Pediatric Dentistry	3	1	5	1	2
Oral Pathology	1	0	5	2	0
Academics and Research	0	2	1	5	2
Oral Radiology	0	0	0	0	3
Oral Medicine	0	0	2	0	1

Future plans

Most (76%) participants expressed a desire to specialise as part of their future plans, this being higher among Moi University students (82%) than among University of Nairobi students (70%) (Figure 1). Respondents preferred private practice (73%) more than they did public service (60%). However, a majority desired to work in public service, but still have some time to engage in private dental service (82%). Very few respondents would consider quitting the profession altogether (22%) to engage in some other profession or income generating activity, and much fewer would consider working throughout as general dental practitioners (15%).

Preferences for dental specialties

Generally, respondents preferred surgical dental specialties (maxillofacial surgery and oral surgery) which when combined had a total of 21 respondents. The most preferred specialties were maxillofacial surgery, restorative dentistry and prosthodontics (n=14 respondents each) (Figure 2). The least favoured career choices were academics and research (n=4), oral radiology (n=2) and oral medicine (n=0). Respondents from Moi University reported highest preference for maxillofacial surgery and restorative dentistry whereas University of Nairobi respondents reported highest preference for orthodontics and prosthodontics (Table

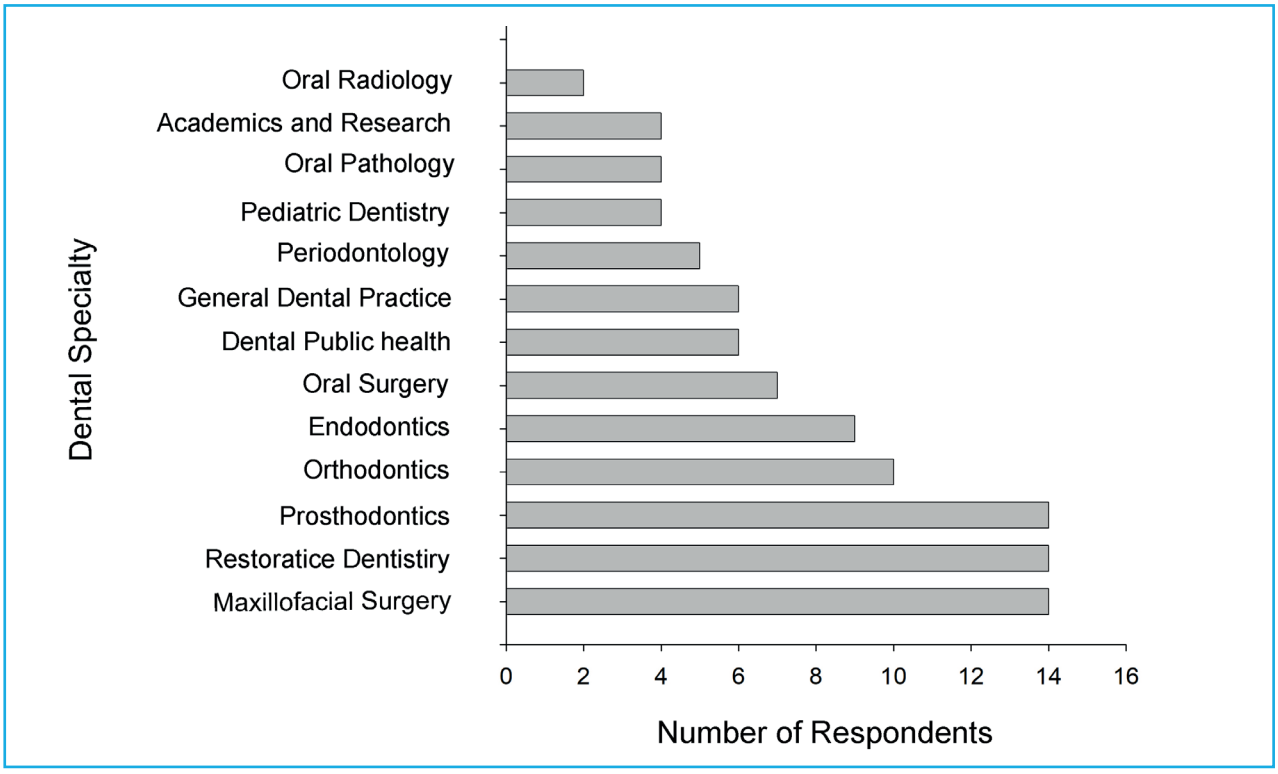

Figure 2: Most preferred specialties for the respondents

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2). Female respondents reported highest preference for restorative dentistry and prosthodontics whereas male respondents reported highest preference for maxillofacial surgery and orthodontics (Table 2). There was no male respondent who indicated a preference for pediatric dentistry. Also, only 1 out of 5 and 1 out of 6 of those who indicated a preference for periodontology and dental public health, respectively, were male.

Factors influencing choice of dental specialties

Personal interest in the various dental specialties as well as the perceived enjoyment in providing the specific specialised care to patients (n=19) were reported as the main factors influencing their choice of specialty. This preference was similar in both males and females, as well as in both institutions. Other factors that were reported to have higher influence on choice of specialty were prospects for higher financial returns (n=15), better ability to put theoretical knowledge into practice (n=15) and better employment opportunities (n=14).

Those who reported maxillofacial surgery as their preferred specialty indicated the four main factors influencing their choice to be: personal interest (19%), better financial return (19%), better employment opportunities (17%) and ability to put theoretical knowledge to practice (17%) (Table 5). Better financial returns (17.2%) as well as personal interest (17.2%) were also key in the choice of orthodontics as the preferred specialty. Personal interest was reported as the main factor and particularly high by those who preferred pediatric dentistry (42%), restorative dentistry (22.6%), endodontics (20.5%) and oral pathology (20%). Influence by faculty was seen to play a key role in the choice for periodontology (18.5%) and restorative dentistry (14.5%) as preferred specialties (Table 5).

Perceptions regarding specific dental specialties

Maxillofacial surgery (n=31) and orthodontics (n=30) were perceived as specialties that best guaranteed higher financial returns (Table 3). Orthodontics and maxillofacial surgery were also perceived to guarantee the highest quality of life for the dental specialist. Respondents perceived dental public health as the specialty with the highest impact to the nation, the community and humanity in general (Table 3). Career options perceived to have the lowest financial return for the specialist were academics and research (n=14), dental public health (n=10) and prosthodontics (n=10) (Table 4). Even though maxillofacial surgery was perceived to have the best financial returns, it was also perceived to have the least quality of life for the specialist (n=14). Oral radiology and orthodontics were perceived to have the least impact to humanity in general (n=17) (Table 4).

Discussion

This study revealed a high desire (strong wish) to specialise among dental clinical year students and dental interns in Kenya. Since personal interest was also found to be the main factor influencing the choice of specialty, the likely reason for the strong wish for specialisation could be to gain the ability to practice in a narrow field of dentistry that best satisfies the interest of the dentist. However, other potential reasons cannot be ruled out. In Kenya, specialisation in dentistry does provide better opportunities for employment, and often leads to promotion at the workplace as well as improved financial returns. These reasons did come out strongly among factors influencing choice of specialty in this study. The higher number of female respondents compared to male respondents in this study is in agreement with universal trends where more women than men are taking up the dental profession across the world.[6,15]

Personal interest was the main motivating factor for specialty choice. We have previously reported that personal interest is a key motivating factor in the choice of dentistry as a career in Kenya.[16] However, similar to other studies, particularly in the developing world, perceived higher financial returns was also an important factor in this regard. An interesting finding in this study was that specialist training would enable respondents to put theoretical knowledge into practice. This appears to support the finding that personal interest (enjoyment in providing the specialised service) is indeed a key motivating factor among Kenyan dental students. Other than variation in the duration of training, other parameters

Table 4: Perception regarding specialties that had the least financial returns, quality of life and impact on humanity

Specialty	Doctor's financial returns (N=67)	Doctor's quality of life (N=61)	Patient's quality of life (N=52)	Impact on the nation (N=60)	Impact on humanity (N=61)
Maxillofacial Surgery	0	18	2	1	2
Restorative Dentistry	2	1	3	2	2
Prosthodontics	10	2	0	1	2
Orthodontics	0	5	6	13	17
Endodontics	1	0	0	2	1
Oral Surgery	1	1	1	0	0
Public Health	14	4	3	0	2
General Practice	7	4	0	2	1
Periodontology	2	3	2	4	2
Pediatric Dentistry	1	2	0	2	0
Oral Pathology	6	2	0	5	3
Academics and research	10	9	17	9	6
Oral Radiology	7	9	12	14	17
Oral Medicine	6	1	6	5	6

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TTable 5: The top five factors influencing the choice for the most preferred specialties. All are in percentages of total respondents for the specific specialty

	Personal interest	Better financial returns	Theory to practice	Better employment opportunities	Influence by faculty	Other reasons
Oral/Maxillofacial Surgery	19.0	19.0	17.0	17.0	13.0	15.0
Restorative Dentistry	22.6	12.9	17.7	12.9	14.5	19.4
Prosthodontics	16.4	16.4	17.9	11.9	13.4	24
Orthodontics	17.2	17.2	13.7	15.5	8.6	27.8
Endodontics	20.5	11.3	9.1	13.6	9.1	36.4
Dental Public Health	17.4	4.3	17.4	8.7	4.3	47.9
General Dental Practice	13.9	10.3	13.9	10.3	13.9	37.7
Periodontology	18.5	14.8	11.1	11.1	18.5	26
Pediatric Dentistry	42.8	0	0	14.2	14.2	28.8
Oral Pathology	20.0	15.0	15.0	15.0	10.0	25.0
Academics and Research	5.0	10.0	0	5.0	10.0	70.0

such as cost of training do not vary much among specialties in Kenyan universities. This could explain why training cost was not reported to influence the choice of specialty.

Previous studies have suggested that a desire for specialisation could vary based on the motivating factors, with financial factors as well as personal interest driving the desire higher, whereas humanitarian factors and cost of specialised training lead to a somewhat lower desire to specialise.[8,17] In the UK, where the key motivating factor was enjoyment of the practice and type of patients seen, the preference for specialisation was lower than in our study.[8] Similar findings have been reported in other studies where, for example, a higher desire to specialise was seen among Chinese and Nigerian dentists due to the perceived associated better financial returns when compared to a lower desire among Japanese, Australian and New Zealand students whose motivation in the profession was to help people and intellectual stimulation.[6,9,18,19] Contrary to findings in this study, some countries such as Saudi Arabia[20] and Japan[6] have reported influence by family members as a key factor determining choice of career in dentistry. The preference for pediatric dentistry by females more than males is consistent with a number of studies such as one in the UK.[8]

In this study, the most preferred specialties were maxillofacial surgery, restorative dentistry, prosthodontics and orthodontics. This could be explained by the fact that participants perceived these specialties to have better financial returns, and that these specialties also evoked high personal interest among the participants. Similar findings have been reported across the world where desire for higher financial gain drives dentists to pursue specialties perceived to have higher incomes such as maxillofacial surgery and orthodontics,[3,17] whereas those more influenced by personal interest and enjoyment of the specialty practice tend to prefer restorative dentistry and prosthodontics.[6,20] Personal interest as a motivation for specialising in pediatric dentistry is almost universal.[21] Positive influence from faculty has been reported to influence choice of specialties such as orthodontics and prosthodontics.[22,23] In this study, those who preferred the specialty of periodontology indicted that faculty were a key factor influencing their choice. Though not reported in other studies, it appears that those who wish to have a higher societal impact tend to choose dental public health and general dental practice as their preferred specialties.

Our finding here revealed that most participants favoured working in the public sector. In Kenya, public sector dentists are among the most well-paid public-sector workers, and this could have been one of the reasons for this preference. Public sector work also often comes with reasonable job security, especially within national government institutions. Another possible reason could be that public sector workers also do get some time to work part time within private enterprises and institutions to make an extra income. Preference for work in the public sector has been seen among dentists in Saudi Arabia.[20]

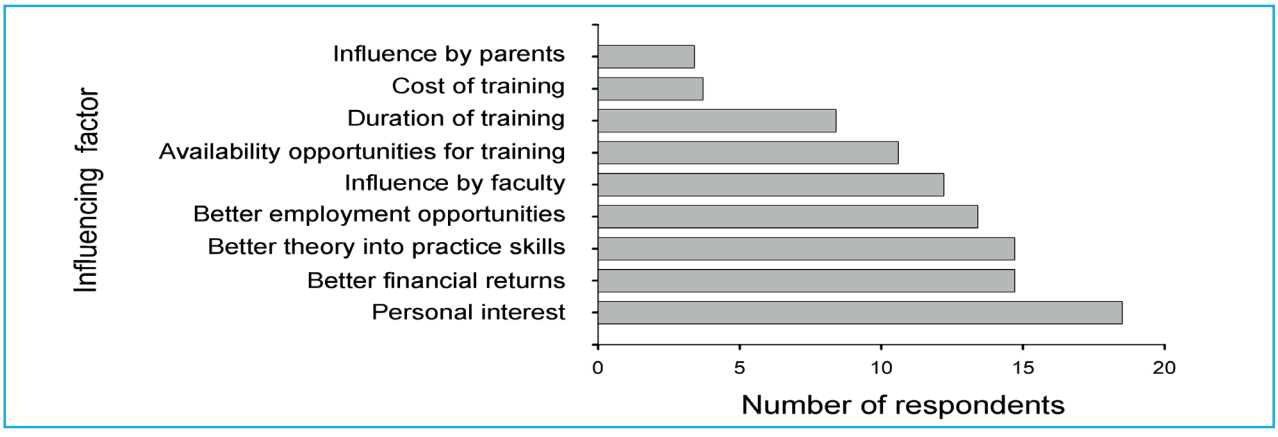

Figure 3: Most relevant factors influencing choice of specialty among the respondents

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CONCLUSION

This study found a high preference for specialisation among dental students and dental interns in Kenya, with maxillofacial surgery, restorative dentistry, prosthodontics and orthodontics being the most preferred specialties. Key factors influencing choice of specialty were personal interest, better financial returns and ability to put theoretical knowledge into practice. Most participants preferred working in the private sector, but future careers that would allow for both public and private service dental practice were favoured more.

RECOMMENDATIONS

There is need for expansion of postgraduate training facilities in dental schools in Kenya to take care of the existing need for this training. Further, dental schools should enhance career mentorship opportunities, particularly through involvement of faculty, to enable better career choices by students.

Study limitations

Though very useful for research, Likert-type scales as used in this study do have some limitations, among them the restricted choice for participants. Our study also reflects perceptions at one point in time, yet it has been shown previously that motivating factors for dental specialty choices do change over periods of time. Follow-up studies may be necessary to address this issue.

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Conflict of interest

The authors declare there is no conflict of interest regarding the publication of this paper and there was no external funding for this work beside that from the researchers.

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Final-year oral hygiene and dental therapy students' perceptions of teaching and learning at a South African university

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ABSTRACT

Introduction

Dental students may provide insightful course evaluation and feedback due to their direct engagement with theoretical and clinical instruction during their training. According to the literature, student feedback may enhance dental education. This study investigated students' perceptions of teaching and learning, the various aspects of which will be discussed further.

Aims and objectives

The study aimed to determine the perceptions of the final-year dental therapy and oral hygiene students regarding teaching and learning at a South African university. Topics such as teaching methods, suitable attributes of academic staff, potential barriers to learning, clinical quotas, effects of the pandemic and recommendations to enhance teaching and learning were investigated.

Methods

A cross-sectional study was conducted during the 2021 and 2022 academic years. Quantitative and qualitative data was captured via an online questionnaire. Participants were asked to rate their perceptions of teaching and learning via a five-point Likert scale and respond to open-ended questions.

Results

Sixty-nine students participated in this study, yielding a response rate of 65.09%. The findings demonstrated students' preference for contact teaching methods such as clinical observation (80%; n=55) and clinical demonstrations (78%; n=54) compared to online lectures (54%; n=37). Stress (78%; n=54) and insufficient feedback (88%; n=61) were identified as learning barriers. Increased clinical training was among the suggestions to enhance learning.

Conclusion

Students should be encouraged to provide feedback regarding teaching and learning as this may positively influence curriculum design and development.

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Keywords

Dental education, teaching and learning, dental students, oral hygiene, dental therapy, teaching methods, academic staff attributes, clinical supervision, clinical quotas, barriers to teaching and learning.

INTRODUCTION

Despite undergoing various changes throughout the decades, most recently due to the COVID-19 pandemic, dental education has strived to produce proficient dental professionals. Dental curricula characteristically consist of three aspects[1], one of which is the delivery of theoretical content via various didactic teaching methods such as lectures, tutorials and problem- and case-based learning.[2] Preclinical training is usually conducted through simulations and other technologically-advanced techniques before clinical training.[2] The latter prepares students for the responsibilities, procedures and working environment they will encounter as professionals. It also enables students to develop further and refine their clinical skills. Globally, this aspect of training was most adversely affected by the pandemic as dental institutions in the US, Australia, Japan and Switzerland, among others, temporarily postponed all clinical activities.[1,3]

The role of the student within a dental institution is no longer regarded as that of a passive learner. The existing literature describes the valuable insight and feedback that students may provide regarding their educational experiences, personal interactions and involvement with the course content.[4,5] This vital information may significantly influence an institution's assessment principles, curriculum review and development, and also provide quality assurance. Students' perceptions of teaching methods, modules and clinical training, among others, may assist in identifying institutional successes and challenges. The feedback can also potentially incite changes and encourage renewed dental education strategies.[6,7]

At the study site, the Dental Therapy and Oral Hygiene programmes are accredited by the Health Professions Council of South Africa (HPCSA) on a five-yearly basis. As part of this process, feedback is obtained from the students, and quality assurance is maintained. The latter is also monitored by the quality assurance unit at the institution.

Students' perceptions of teaching and learning may be influenced by the educational environment which, as cited by Bhayat et al. (2018), includes the infrastructure of an institution, clinical activities, clinical supervision and

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the atmosphere that is created by staff and students.[8] Academic staff may be involved in training either as a lecturer, clinical supervisor or both. While the primary role of such an individual is to facilitate learning effectively, staff may also use the opportunity to instil positive attributes and values in students.

The pandemic introduced unprecedented challenges for students and academic institutions. Several dental schools implemented online learning to deliver course content.[1,9] Other institutions implemented a hybrid learning model, combining online learning with preclinical and clinical contact teaching.[10] While e-learning ensured that teaching and learning continued, several associated challenges have been reported in the literature.[10-12] In addition, the changing curriculum and implementation of home-based learning meant that students were required to adapt to a new environment and adopt new learning strategies. Previous perception-based studies identified various barriers that affected learning, such as graded assessments[13,14], the limited number and availability of clinical staff[13], and the dissociation between theory and clinical training.[15]

This mixed-methods study aimed to determine dental therapy and oral hygiene students' perceptions of teaching and learning, at the respective training site, via an online questionnaire. The results of this study may contribute to the current understanding of students' preferences, challenges and suggestions to enhance dental education.

METHODS

Research setting and context

This study was conducted at a South African dental school. The Social Sciences and Humanities Ethics Committee granted ethical approval (HSSREC/00002902/2021). Gatekeeper permission was received from the registrar of the university.

Research design

A mixed-methods study was conducted during the 2021 and 2022 academic years. An online questionnaire consisting of open and closed-ended questions enabled the collection of quantitative and qualitative data. Students rated their perceptions of teaching and learning via a five-point Likert scale. For section 1, participants were requested to rate the influence of various teaching methods on their academic performance from 1 to 5, which represented "least influence" to "most influence" respectively. The remaining sections, namely characteristics of a lecturer, clinical supervision, barriers to learning and clinical quotas, required a rating of 1-5 which represented "strongly disagree" to "strongly agree" respectively. The open-ended questions related to the effects of the pandemic, strategies that may enable continued learning and recommendations to enhance teaching and learning. In 2021, a pilot study was conducted among nine second-year dental therapy students. The participants successfully completed the questionnaires on Google forms and clearly understood the various sections.

Participants

All final-year dental therapy and oral hygiene students (n=106) were invited to participate in the cross-sectional study, of which (n=69) agreed. Participants consisted of three cohorts: the dental therapy classes of 2021 and 2022 and the oral hygiene class of 2022. The oral hygiene class of 2022 were the first graduates of the restructured programme, which is currently being offered as a degree at the study site.

Data collection and analysis

Data was collected between August 2021 and September 2022. An information sheet and consent form were made available to all students. All participating students consented to their involvement in the study. Anonymity was maintained throughout the study as participant names were not requested.

An online questionnaire on Google forms was accessed via a link. Quantitative and qualitative data were analysed using statistical and thematic methods, respectively.

RESULTS

Demographic details

The mean age of participants was 21 years old. The participants' ages ranged from 19 to 25 years old, most of whom were 20 years old (39%; n=27).

Table 1. Student perceptions of teaching methods

Teaching Method	Frequency (n)			P-value
	Influential	Neutral	Less/least influential	
Clinical observation	55	3	11	0.8
Clinical demonstrations	54	5	10	0.5
Preclinical demonstrations	49	8	12	0.2
Simulations	47	12	10	0.8
Case-based discussions	47	13	9	0.1
Group discussions	41	18	10	0.4
Clinical videos	40	17	12	0.5
Lectures/PowerPoint presentations	40	14	15	0.9
Printed lecture slides	40	10	19	0.7
Online lectures	37	12	20	0.6
Blended learning	34	16	19	0.8
Online tutorials	31	15	23	0.8

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Most participants were female (71%; n=49), followed by males (28%; n=19) and 1% (n=1) who preferred not to disclose their gender.

According to the Kruskal-Wallis tests, which were conducted to investigate the relationship between each student cohort and the various sections of the questionnaire, no statistically significant associations were reported except that the oral hygiene students preferred digital notes compared to handwritten notes (p=0.05).

Perceptions of teaching methods

Participants were asked to rate the influence of various teaching methods on their academic performance via a five-point Likert scale. To represent the data in Table 1, the frequencies of responses were combined for the most and least influential teaching methods. More than 50% of the participants (57%; n=39) regarded preclinical demonstrations as the "most influential" teaching method. The teaching method with the overall highest rating was the clinical observation of a supervisor (80%; n=55). According to the participants, online tutorials (33%; n=23), online lectures (29%; n=20) and blended learning (28%; n=19) had the least influence on academic performance.

Suitable attributes of a lecturer

Participants were presented with various statements regarding the attributes of a lecturer and requested to rate their perceptions of each one. Respondents strongly agreed that a lecturer should be organised (81%; n=56), allow students to ask questions during or after a lecture (78%; n=54), present content interestingly and engagingly (83%; n=57), and promote student interaction in class (68%; n=47). Most participants believed that learning was enhanced when a lecturer possessed a wide range of knowledge (77%; n=53) and considered rapport between a student and lecturer to be important (75%; n=52).

Clinical supervision

Participants rated several statements relating to clinical supervision. Most participants strongly agreed that a clinical supervisor should be enthusiastic (72%; n=50), available when required by the students (68%; n=47) and possess good interpersonal/communication skills (77%; n=53). Participants also strongly agreed that a supervisor with good clinical skills motivated students to be better clinicians (77%; n=53) and that effective learning occurred by regarding the supervisor as a role model (59%; n=41).

Students were also strongly in favour of assessing clinical performance according to objective assessment standards (71%; n=49) and receiving constructive feedback about their clinical performance (74%; n=51).

Potential barriers to teaching and learning

Students were requested to rate their perceptions of potential barriers to learning (Figure 1). Participants agreed that insufficient feedback restricted their learning (88%; n=61). Stress was reported as a hinderance to students' learning (78%, n=54) and clinical performance (80%, n=55). Only 38% (n=26) of participants reported a disconnect between theoretical knowledge and clinical training. More than half of the oral hygiene participants (55%; n=6) remained neutral. Participants preferred graded to non-graded continuous assessments (65%; n=45) and agreed that increased student numbers limited clinical contact (74%; n=51).

Regarding various statements concerning e-learning, 77% (n=53) of participants had access to a computer or laptop, while 62% (n=43) had access to data or the internet. Most participants did not encounter difficulties with the e-learning website (61%; n=42). Students preferred written/printed notes compared to digital notes (54%; n=37), although 55% (n=6) of the oral hygiene students disagreed with this statement (p=0.05).

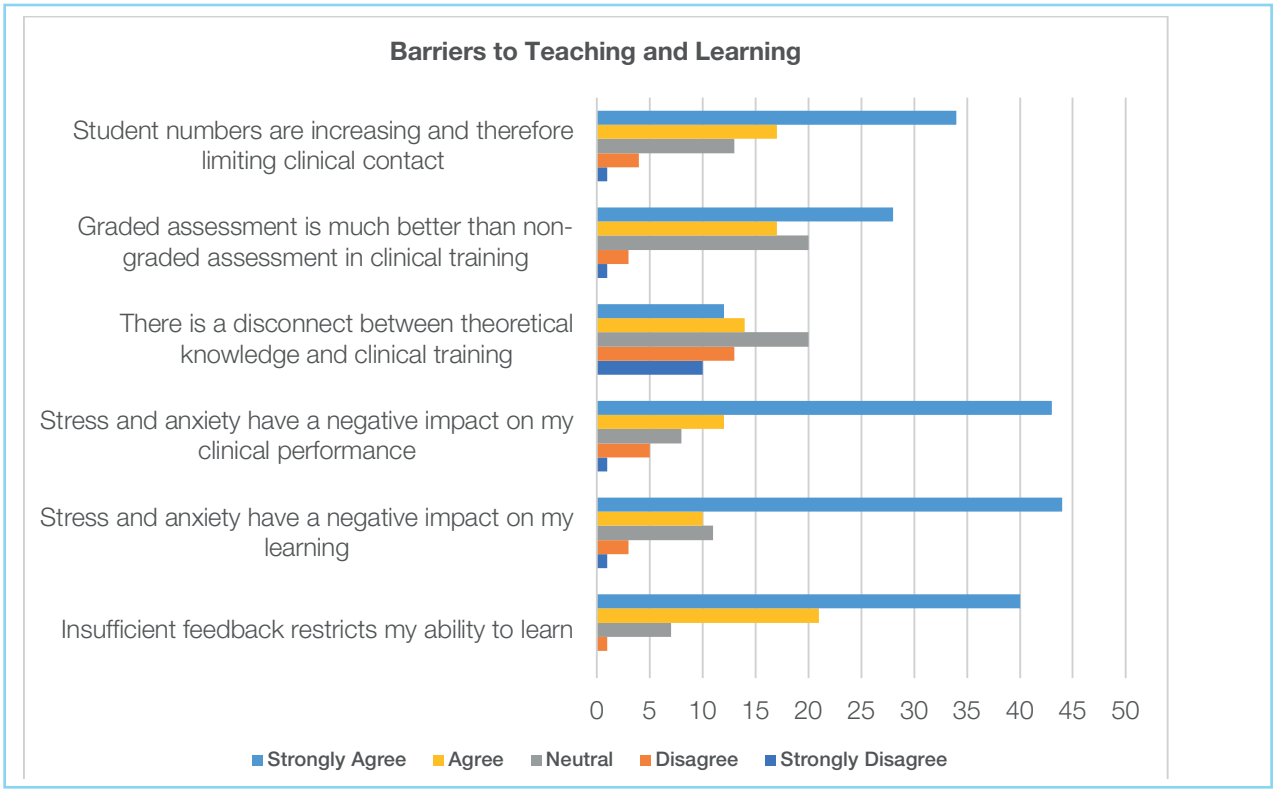

Figure 1. Barriers to teaching and learning

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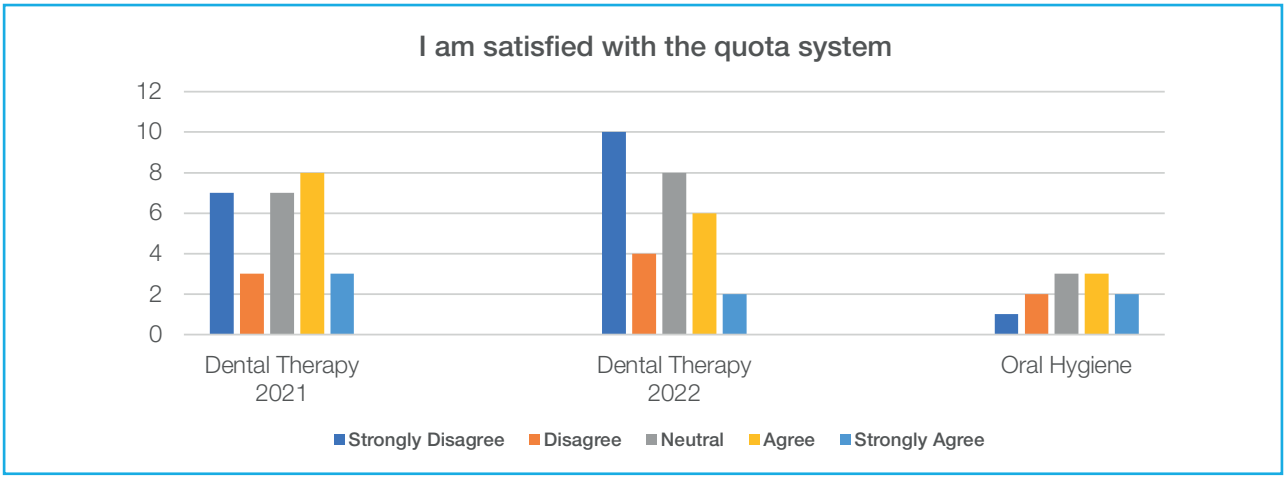

Figure 2. Student perceptions of clinical quotas

Clinical quotas

The final section required participants to rate their satisfaction with the clinical quota system (Figure 2). In compliance with the course requirements, a minimum number of procedures, or quotas, were to be completed by students. In contrast to the other sections of the questionnaire, various opinions were reported. Participants were generally unsatisfied with the quota system (39%; n=27) compared to 35% (n=24), who were satisfied and 26% (n=18) who remained neutral.

Qualitative data analysis

Open-ended questions formed part of the questionnaire, enabling further insight into students' perceptions of teaching and learning. The results were analysed using thematic analysis. Questions 1-7 appear with participants' supporting quotes.

Question 1: What is the best method to deliver theoretical knowledge to students and why?

Participants favoured contact lectures as this teaching method provided a distinct understanding of content, enabled students to focus on the lecture content, and promoted student-lecturer engagement.

"It's easy to understand. Whenever something isn't clear, you are able to ask questions and … revise your work with full understanding." (P32)

"It is easier to focus and understand a person when seeing them live compared to a screen." (P51)

"Lectures (are) more personal and interactive." (P21)

"… it gives learners the information that they are looking for, without any external interruptions such as connection issues you get during loadshedding with online learning." (P38)

Demonstrations were regarded to be effective as students were able to grasp and retain knowledge easily. Students also supported group and case-based discussions.

"Demonstrations on the topic discussed also help in better understanding as students have different learning methods." (P65)

"Allows us to use our minds in an environment where it is easy to remember." (P47)

"I understand the theory better when I am doing the practicals and discussing case studies." (P18)

Videos were considered to enhance learning by providing a visual representation of the notes. *"I engage better with my work when it is taught using this approach. Audiovisual aids help a lot in the learning process rather than simply reading off lecture slides." (P27)*

"They better explain or demonstrate what we have learnt and make it easier to understand the notes and what exactly is expected from me as a student." (P30)

Question 2: In your opinion, what are the characteristics of a suitable lecturer?

Students were in favour of a lecturer who encouraged interactive learning.

"A good lecturer allows students to express their opinions and ask questions." (P30)

Participants also valued attributes such as being supportive and understanding.

"A good lecturer for me is someone who's understanding … someone who's able to take the concerns of learners into consideration, not for him/her to dismiss them easily without even looking into the matter." (P64)

"Being … understanding to the different circumstances that the students may be faced with." (P38)

Punctuality and organisation were also regarded as important attributes of a lecturer.

"A good lecturer is well organised, manage(s) time very well." (P24)

According to participants, an approachable lecturer created an environment that promoted learning.

"He/she is one who is friendly, kind and approachable. Having that kind of a lecturer provides a comfortable space, and teaching and learning becomes easier." (P55)

"One who is easy to ask if you have questions or need clarity. We shouldn't be afraid to ask. The environment should be free, so we can engage." (P3)

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Participants favoured a knowledgeable lecturer who was capable of teaching and sharing their knowledge.

"A person who is knowledgeable and is able to teach and share their knowledge with others." (P39)

"A teacher who shows interest … efficient teaching skills … strong knowledge." (P67)

Question 3: What are the factors that hinder your learning?
Participants reported several barriers that affected clinical training, such as a limited number of patients, inadequate clinical training time and clinical sessions, quality and delivery of feedback, and increased student enrolment.

"Limited numbers of patients in the clinic." (P14)

"Time constraints in the clinical setting." (P28)

"Not enough exposure to clinical training." (P59)

"Lack of academic feedback." (P63)

"Getting criticised about my work instead of being advised on how to do it right and correct my mistakes." (P65)

Not being equally exposed to clinical sessions because of the increase in student numbers." (P2)

Stress, anxiety and depression were also reported as barriers by the study participants. Stress was most associated with the clinical setting and workload.

"Sometimes the environment at the clinic is too stressful for learning." (P24)

"Too much work at once produces too much anxiety and stress, which makes me unable to cope with school." (P30)

Students identified several barriers to e-learning, such as limited student-lecturer interaction and external factors, such as unstable internet connectivity or power outages.

"The interaction between lecturer and student is severely hindered due to the lack of engagement in e-learning." (P4)

"The Wi-Fi at my res is bad even though I've complained for three years, so I use the data that our university provides us with, but the network is bad, it's worse with loadshedding." (P18)

"Network issues." (P59)

"Poor internet connectivity." (P30)

Question 4: Why are you satisfied, neutral or unsatisfied with regard to the clinical quota system?
Unsatisfied participants attributed their perceptions of the system to clinical barriers that hindered the achievement of their quotas.

"It increases stress for learners to see a certain number of patients just for a mark instead of working at our own pace and focusing on areas we think we need to do more in." (P22)
"With the restricted times in the clinic and the number of students and patients who don't show up for recalls or patients who have to be deferred due to complications, it is difficult to reach quotas." (P34)

"During certain days, some students leave the clinic without having seen a patient due to patient shortage, and only two days in a week of going to the hospital might not be sufficient in the achievement of all those quotas." (P55)

Participants who were satisfied with the clinical quotas reported that meeting the requirements assisted in their preparation for independent practice and acquiring clinical competency.

"It is only sensible to do so much as final year students. I understand we need to be fully prepared for the outside world and its demands." (P66)

"I think the given number … does make us competent at the end." (P64)

"… I will get more exposure and experience regarding the clinical training process." (P33)

Students who expressed neutral views acknowledged the existing challenges and possible enhancements that could be made.

"The quotas are fair but very difficult to attain when we don't have enough working units and patients coming in." (P36)

"Only if they make sure that students see patients equally and fairly." (P53)

Question 5a: How has the pandemic affected how you approach learning?
A decrease in contact teaching and clinical training were observed during the pandemic.

"I didn't get much exposure to contact learning and other resources at campus." (P63)

"I have had too little exposure in terms of practical … My big worry is that when I go out there, I will be expected to know everything and do it perfectly despite me not having the adequate training and exposure." (P56)

Students' motivation to study was also affected during this time.

"Learning has become dreadful and exhausting." (P2)

"It has made my work ethic bad, I have trouble finding the motivation to learn or even go over work." (P7)

"I used to love learning, now it's a struggle, just about passing my assessments and getting this degree done." (P65)

Students reported the various ways in which they adapted to the challenges.

"I had to adapt to doing everything on the computer and attend online classes, which at first was very difficult, and I'd even fall asleep while attending." (P41)

"It made me realise things can change anytime and we need to be able to adapt in different situations." (P54)

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"I learned to study hard and go an extra mile for all my modules because it all about theory now." (P14)

Question 5b: Which strategies can assist students in continuing their studies during such times?
According to participants, self-discipline and students' commitment to learning were essential in continuous learning.

"Dedication, prioritising school work and putting in the needed and required efforts in order to succeed." (P66)

"Self-discipline is key." (P49)

Interactive e-learning, tutorials and group discussions were identified as suitable teaching methods that would support continued learning.

"More interactive online learning." (P39)

"Recorded lectures." (P36)

"More tutorials." (P38)

"Have tutorial sessions besides from the lecture classes." (P55)

"… discussing clinical cases as groups." (P58)

'Vocal or (other) ways to allow students to interact as a group." (P57)

Participants favoured various types of non-graded assessments, which were supplemented with feedback from their lecturers.

"A lecturer can structure a default activity for learners to complete … and mark it." (P4)

"After the students have participated in the lecture, they should be given quizzes every week on the work and given appropriate feedback." (P7)

"More self-assessment given to students so that they can understand more." (P6)

Question 6: How can clinical training be enhanced at your institution?

Participants reported that clinical training should be introduced at an earlier stage in the course.

"To be engaged in clinical work earlier in the degree." (P4)

"More training please … starting to extract teeth at third year is not okay. We need to start at least the second semester of the second year." (P53)

An increase in clinical sessions and exposure to patients was also suggested by participants.

"Giving students more clinical sessions." (P60)

"We need more practicals." (P17)

"Creating a system that will ensure each learner gets to see at least one patient a day." (P68)

"To be exposed to more patients so that we can get more clinical experience." (P65)

According to participants, the provision of robust feedback, an increase in the number of clinical supervisors and improved student-lecturer interaction were potential enhancements to teaching at the institution.

"Receive more feedback about my performance after clinical session." (P64)

"Supervisor that can give feedback in a well-mannered and constructive way, not just criticise." (P54)

"The ratio of supervisor to students should also be kept to a minimum to ensure adequate attention to each student." (P27)

"Having more clinical supervisors for the supervision of quite a number of students." (P55)

"By improving communication between students, lecturers and supervisors." (P67)

"Engage with students and know more about their challenges." (P37)

"Ensure that lecturers or supervisors are approachable so students can freely approach them instead of being afraid to do so." (P41)

Question 7: As a student, what suggestions or changes would you like to see being implemented to enhance your educational experiences?
Participants noted that an association should exist between theory and clinical training. Furthermore, students reported that the curriculum should include more practical training than theoretical content.

"Theory must correspond with clinical practice." (P56)

"To have more practical work than theory." (P24)

Blended learning was suggested as a teaching method to enhance students' educational experiences.

"Using both online and contact learning can help students in understanding their work." (P30)

"A blended approach to learning with both online and physical lessons is a less stressful way to learn." (P46)

Participants suggested a decrease in the number of quotas or a change to the existing system.

" … reduce clinical quotas." (P42)

"A more accommodative quotas system." (P38)

"…issue of quotas must be addressed because this degree is quota-driven." (P65)

DISCUSSION

Overall scores, as represented by Table 1, indicated that the largest frequency of participants regarded the clinical observation of a supervisor to be an influential teaching method. Students who participated in the study by Gerzina

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et al. (2005) regarded the observation of a clinical supervisor "as one of the best forms of clinical teaching".[2] Most participants rated preclinical demonstrations as the "most influential" teaching method on their academic performance. The overall scores for section 1 of the questionnaire also revealed that participants favoured clinical demonstrations. The qualitative data of the current study supported students' preference for demonstrations and indicated that videos, case-based and group discussions were also associated with effective teaching. Despite the primary implementation of online learning during the pandemic, participants of the current study regarded online tutorials, online lectures and blended learning as the least influential teaching methods. The qualitative results of the current study further corroborated these findings, as almost half of the respondents favoured contact lectures in delivering theoretical knowledge. Similar results were observed by Bourzgui et al. (2020), as 53.8% of participants were in favour of face-to-face teaching.[16] Noor et al. (2022) reported that 73.8% of participants in their study regarded contact teaching as a "better mode of learning" than e-learning.[17] Quinn et al. (2020) concurred with these findings.[18]

Students valued the opportunity to ask questions and feel understood regarding their academic needs and challenges. Respondents of this study strongly agreed that class participation should be encouraged by a knowledgeable, organised, punctual and approachable lecturer. These attributes are also featured in the qualitative findings of this study. The lecturer's delivery of information was important to students of the current study. Participants also noted that the ability to teach and share knowledge were essential skills for the role. According to Hussein (2017), students identified attributes such as patience, approachability and enthusiasm in their own lecturers and regarded these as favourable.[19]

Most students regarded good interpersonal and communication skills, enthusiasm and availability as important attributes of a clinical supervisor. Learning was positively influenced by a supervisor who was regarded as a role model, and students were motivated by the demonstration of effective clinical skills by the supervisor. According to Ansary et al. (2011)[4], students associate attributes such as commitment, good teaching skills, approachability, being knowledgeable and having a positive attitude with effective learning in a clinical environment. Schönwetter et al. (2006) identified seven ideal attributes of teaching, of which individual rapport, organisation and enthusiasm were most frequently associated with effective clinical and classroom teaching.[20] Similar results were observed in the current study. Furthermore, both groups of participants valued fair assessments, insightful feedback and interactive learning where students were encouraged to participate and ask questions.

Participants were in support of constructive feedback concerning their clinical performance. Despite this, most students reported that learning was affected by insufficient feedback. The qualitative data supported this finding, as insufficient feedback and unconstructive criticism were considered barriers to learning. According to respondents of the current study, learning could be enhanced through consistent and constructive feedback that motivated students and helped them learn from their mistakes. Ansary et al. (2011) and Ebbeling et al. (2018) similarly observed students' support of feedback that was insightful, provided guidance and enabled them to identify improvements to their clinical performance.[4,10] As cited in Nerali et al. (2021), inadequate and inconsistent feedback negatively affects learning.[21-23] Ebbeling et al. (2018) reported students' concerns regarding the quality of feedback from their supervisors. The same authors cited studies by Anderson et al. (2011), Fugill (2005) and Henzi (2006), where dental students described clinical feedback as "sparse, non-useful or demeaning".[10,24-26]

In the clinical environment, students preferred graded rather than non-graded assessments. Furthermore, participants strongly supported using objective assessment standards to evaluate their clinical performance. In contrast to the results observed by Gerzina et al. (2005), students were neutral with regard to grading.[2] Studies by Nerali et al. (2021) and Alves De Lima (2008) reported similar findings to the current study, where students preferred feedback that could be compared to "an established range of standards".[21,28] A further finding of this study reported that inconsistent teaching among clinical supervisors hindered learning.

Stress and anxiety were considered barriers to learning and clinical performance. This finding was reflected in the quantitative and qualitative data of this study. According to students of the current study, stress resulted from negative encounters with clinical supervisors, the clinical environment, the required work volume and personal issues. Wilson et al. (2015) cited various studies that acknowledged the high incidence of stress among dental students due to possible causes such as "heavy workload", "challenging relationship with academic staff" and "the learning environment".[28-42] Participants of the study by Wilson et al. (2015) regarded factors relating to the dental environment and theory as being more stressful than those relating to clinical aspects.[28] These findings are in contrast to the current study.

The dental therapy students in this study reported that increased student numbers limited clinical exposure. The qualitative data confirmed this finding. A scoping review by McGleenon and Morison (2021) reported that dental schools across the UK raised concerns about increased student enrolment as the quality of training was negatively impacted by the unfavourable ratio of staff to students.[43]

Participants of the current study also expressed concerns regarding the limited clinical training and time to complete the course's practical aspect. This was attributed to various factors such as COVID-19, the insufficient number of clinical units, the inadequate number of functional dental chairs and the limited number of patients that presented for dental treatment. Current study participants stated that treatment was often deferred due to the patient's medical history and that recall appointments were often unattended. According to McGleenon and Morison (2021), dental schools across the UK experienced a scarcity of patients for various reasons, such as a lack of patient compliance and unpredictable appointments.[43] McGleenon and Morison (2021) further noted that students' clinical experience was adversely affected by the limited number of patients.[43]

Most students had access to a computer/laptop and the internet/data. The majority of participants did not experience difficulties with the e-learning website. The most commonly reported barriers that students encountered were poor network and connectivity in addition to the Wi-Fi at students' residences, loadshedding and access to data. According to participants of the current study, e-learning negatively impacted interaction and communication between the

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lecturer and students. The study by Varvara et al. (2021) in Italy also expressed concerns regarding the "low-quality internet connections".[9] A study conducted in Pakistan by Noor et al. (2022) reported that 77.7% of students strongly disagreed with the continued implementation of e-learning, possibly due to the absence of face-to-face engagement, impaired concentration over a prolonged period and "poor or interrupted internet connectivity".[17] In contrast to this finding, a study by Mamattah (2016) in Ghana reported that students supported e-learning.[44] An additional result of the current study is that most students prefer handwritten notes to digital notes on a screen.

The way students approached learning was significantly affected by the pandemic. Students adapted their learning style and became accustomed to online learning, assessments and electronic devices supporting this. However, the participants noted they no longer enjoyed learning and were unmotivated to study. Despite the challenges, several participants were encouraged to commit more to their studies and maximise their available time. Conversely, the Iosif et al. (2021) study in Romania reported that students' motivation remained "unaffected" during the pandemic.[3] Students also reported a decrease in contact teaching, clinical training and the number of patients at the training site, which affected students' exposure to various procedures. Students' access to study materials, activities and resources on the main campus was also affected during this time.

Participants suggested strategies that may enable learning to continue under circumstances similar to the pandemic. The implementation of teaching methods such as e-learning, tutorials and group discussions was considered beneficial by the students. Participants also supported assessments such as quizzes and other activities in combination with feedback from their lecturers, all of which would help them evaluate what they understood. Respondents also identified the importance of their role in the continuation of learning by prioritising their studies, practising efficient time management and exercising self-discipline.

Most participants were unsatisfied with the clinical quota system. Various challenges influenced the attainment of quotas, including increased student numbers that limited patient access. Limited clinical training was a concern as students presented to the clinic twice a week and often did not treat a patient despite attending all the sessions. An insufficient number of patients presented for dental treatment, especially during the pandemic, and appointments were often not attended. Students also stated that they did not receive equal opportunities to treat patients, yet the number of quotas was standard for all students. Participants who were satisfied with the system reported that it enabled students to gain clinical experience in preparation for their professional careers. In pursuit of the quotas, students of the current study were encouraged to work hard and achieve a higher level of competence with each new procedure. Participants who expressed neutral views considered the quota system fair but acknowledged that various challenges, some of which were not within the control of students, affected whether the requirements would be met. McGleenon and Morison (2021) cited studies by Lynch et al. (2010), Davey et al. (2015), Clark et al. (2011) and Gilmour et al. (2016), which stated that students' clinical experience was limited in the absence of achieving minimum requirements.[43-48]

The participants of all three cohorts noted that increasing clinical training and re-introducing contact teaching, either in isolation or in combination with online learning, would benefit students. The dental therapy participants suggested that clinical training should be introduced earlier in the course rather than in the final year. According to Mullins et al. (2003), as cited by Gerzina et al. (2005), early exposure to the clinical environment benefits students as this aids in creating an association between basic and clinical sciences and introducing students to contextual learning.[2,49]

Participants of the current study suggested that more supervisors should be present in the clinic as this would enhance the efficiency of clinical training. South African dental students (46.7%) who participated in the study by Wilson et al. (2015) reported that the ratio of supervisors to students was a cause of stress.[28] According to Ebbeling et al. (2018), students reported the limited number of clinical training staff and, in turn, their unavailability during the clinical sessions.[10] This was similarly conquered by Henzi et al. (2007) and Pyle et al. (2006).[26,50]

The qualitative and quantitative data revealed that, according to students, a disconnect existed between theory and clinical training. Participants stated that both aspects of the curriculum should correspond and that more emphasis should be placed on clinical training rather than the theoretical component. In contrast, students who participated in the Gerzina et al. (2005) study agreed that a link existed between theory and clinical practice.[2] The oral hygiene cohort of participants favoured clinical supervision being conducted by oral hygienists who would be more familiar with the scope of practice.

Further suggestions included introducing an additional training site, improved engagement between the academic staff and students, regular exposure to patients, implementing modern technology at the institution and a more accommodating quota system.

RECOMMENDATIONS

This study may potentially provide insight into students' experiences at the study site and ways in which the course structure and delivery may be enhanced. The current study may also contribute to the existing literature on dental education during the pandemic. Opportunities for future research may include participants from other institutions and disciplines.

CONCLUSION

This study highlights the various perceptions of dental therapy and oral hygiene students regarding teaching methods, suitable attributes of academic staff, potential barriers to learning, clinical quotas, effects of the pandemic, strategies that may enable continued learning and recommendations to enhance teaching and learning. Possible limitations are the use of a single study site and the small sample size. The results of this study cannot be generalised due to these limitations. The study was also extended into the 2022 academic year due to the effects of COVID in 2021. The use of student perceptions in dental education, especially regarding curriculum design, is highlighted in this study. Institutions should regularly engage with students by providing a platform to discuss successes, challenges, recommendations and other relevant topics. This will promote students' involvement in their learning

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process and may lead to impactful changes within dental education.

DECLARATIONS

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Competing interests

The authors declare they have no competing interests.

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YOUNG PUBLISHER COMPETITION GUIDELINES 2023

The Young Dentists Council (YDC) of the South African Dental Association (SADA) hereby extends an invitation to all South African Academic Institutions and Public as well as Private Health Facilities to participate in their 4th annual SADA YDC 2023 Young Publisher Competition. The competition will be hosted at the SADA Dental & Oral Health Congress & Exhibition 2023, which will be held from the 25th - the 27th of August 2023 at CTICC2, Cape Town.

We, therefore, request Deans and their relevant Heads of Department to pre-select candidates to participate in the poster competition. Eligible principal candidates must be postgraduate students. Eligible independent dental researchers are also encouraged to submit their abstracts.

Posters can be submitted in the following four categories of research:
- Undergraduate clinical research
- Undergraduate non-clinical research
- Postgraduate clinical research
- Postgraduate non-clinical research

The research project must be presented in the form of a poster and the 3 finalists will be invited to a 10-minute (maximum) interview session with the judges. The slot will comprise a 10-minute presentation by the participant and a 10-minute discussion/questions opportunity for the judges. English will be the language of the competition.

Eligible researchers
The principal candidate must be:
· 35 years of age or younger at the time of the Young Publisher Competition.
Co-researchers should also be members of SADA but may be older. There should be a maximum of three co-authors.

DUE DATES FOR ABSTRACT SUBMISSION AND PROGRAMME
- Abstract Submission opens 1 March 2023
- Abs•tract Submission closes 17 July 2023
- Judging 24 Aug 2023
- Presentation on Main Podium 25 August 2023
- Award Ceremony 26 August 2023

Oral Presentations of the poster will be restricted to 20-minute slots per finalist which includes questions posed by the judges. Answers given should be clear and concise reflecting an understanding of the subject matter.

Guidelines for the Young Poster/Publisher competition
1. Manuscript (maximum 10 pages) and abstract to be
2. Hereunder the abstract guidelines
   - Word count limit - maximum 500 words
   - Title
   - Background/Significance
   - Aims and objectives
   - Methods
   - Results
   - Conclusions

3. Judging of the final 3 posters will take place on the 24th of August 2023. Time and specific venue for presentations will be communicated to the finalists once all abstracts have been accepted and the final participants' numbers are confirmed.
4. Authors should report to the judging venue at least 30 minutes before the Judging Session.
5. All Posters will be in digital format

JUDGING OF POSTERS
Judges will follow the preselected criteria for the judging of the posters and the winner will be announced at the Gala dinner on 26 August 2023 at the CTICC2.

There will be one overall winner.

The Young Researcher award judging criteria is as follows:
CRITERIA
Appearance
- Does the poster make an impression on the viewer?
- Professional appearance; the good flow of information; logical layout; easy to read; neatness. How much text does the poster contain?
- Is there any grammar or spelling mistake?

Title
- Clear and concise; specific; adequate.

Background
- Provides sufficient rationale for pursuing the study.
- Aims and Objectives
- Clearly stated and relevant.

Methods
- Strong and appropriate for testing this hypothesis or fulfilling the study objective.

Results
- Quality of the graphs, tables, and figures; the complexity of the results; validity of these statistical methods.

Discussion
- Shows a rational understanding of the results and literature.

Conclusions
- Reflective of the Aims and Objectives; supported by data; consistent with the hypothesis being tested.
- Are the limitations of the study/suggestions for future research identified?

Scientific content
- Relevant; contributing to the advancement of Dentistry.

*****The final score will be derived from the manuscript and the poster.

AWARD CEREMONY
Finalists will be invited with their partners to attend the Gala Awards Function on 26 August 2023 when the winner will be announced.

AWARDS
- SADA Young Publisher Award
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Retrieval of displaced dental implant in maxillary sinus by modified Caldwell Luc technique

SADJ June 2023, Vol. 78 No.5 p268-270

Kruttika Bhuse[1], Tanay V Chaubal[2], Ranjeet Bapat[3]

ABSTRACT

Displacement of dental implants into the maxillary sinus is an uncommon complication during implant placement. Here we present a case report of retrieval of dental implant displaced in the maxillary sinus with modification of Caldwell-Luc technique.

A 35-year-old man presented to our institution for replacement of the maxillary right first molar using dental implant. At the point of final tightening of the implant, it suddenly got displaced into the maxillary sinus. The displaced dental implant was retrieved by performing a modification of the Caldwell-Luc technique which utilises gravitational force, saline as a vehicle and a tight-fitting suction tip in the surgically created lateral window. He was also instructed in coughing and sneezing techniques. Medical and dental professionals can utilise this technique effectively when advanced equipment such as endoscopes are not available to retrieve dental implants displaced in the maxillary sinus and it also preserves significant amount of alveolar bone in comparison to the traditional Caldwell-Luc technique.

Keywords

Dental implants, maxillary sinus, modified Caldwell-Luc.

INTRODUCTION

The use of dental implants for replacement of missing teeth has become a mainstay in contemporary dental practice. Success of implant therapy depends on various factors, one being the quality and quantity of residual alveolar bone required; it is often inadequate in the posterior maxilla due to pneumatisation of the maxillary sinuses.[1] Inadequate bone may be augmented by performing sinus lift procedures for dental implant placement.

During these procedures complications such as perforation of the sinus membrane, bleeding from the sinus cavity and displacement of implants into the maxillary sinus may arise.[2] Displacement of dental implants into the maxillary sinus may lead to postoperative sinus infection.[3,4] There are three methods available for retrieving displaced dental implants in the maxillary sinus: the Caldwell-Luc technique, the endoscopic method and modification of the Caldwell-Luc method.[5,6] Here we present a case report of retrieval of a dental implant with this modification of the Caldwell-Luc technique.

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Case description

A 35-year-old man reported to the dental office for replacement of the missing maxillary right first molar using dental implant. Preoperative cone beam computed tomography analysis revealed bone width of 5.5mm and height of 9mm with fine trabecular bone of density 200 HU (Misch bone density classification). The patient was systemically healthy with healthy periodontal condition and adequate oral hygiene. Prior to the implant placement procedure informed written consent was obtained from the patient. Local anesthesia in the form of buccal infiltration and greater palatine nerve block on the palatal aspect was administered with 2% lignocaine HCl and 1:80,000 adrenaline (ICPA health products, Mumbai, India). Following a crestal incision, a full thickness mucoperiosteal flap was elevated. A sequential undersized osteotomy was prepared with the final drill being 3.2mm x 8mm. An implant of size 3.75mm in width x 8mm in height (AlphaBio, Petach Tikva, Israel) was introduced into the osteotomy with the help of a fixture driver and torqued up to 30Ncm with a torque wrench. At the point when the implant got completely seated a quarter turn was given with the torque wrench and suddenly the implant got displaced into the maxillary sinus. Immediate aspiration attempts to retrieve the implant were unsuccessful. Multiple periapical radiographs showed that the implant kept changing its location with change in head position.

The osteotomy was then expanded to 6mm for further aspiration of the dental implant through the crestal osteotomy but the retrieval attempt failed. Parasagittal view of cone beam computed tomography revealed breach in the continuity of the maxillary sinus with the implant oriented towards the anterior wall of the maxillary sinus (Figure 1). The final position of the implant appeared to be in the anterior wall of the maxillary sinus. A modified

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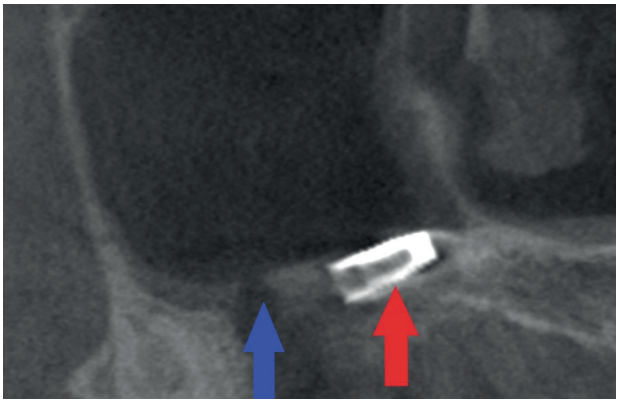

Figure 1: Parasagittal view of cone beam computed tomography showing breach in continuity of maxillary sinus (blue arrow) and implant in sinus (red arrow).

Caldwell-Luc approach was used wherein a round lateral maxillary osseous window was created into the sinus with the help of No. 8 diamond bur (Figure 2). A sterile plastic surgical suction tip was cut to fit exactly into the lateral osseous window and subsequently the sinus was filled with sterile saline via a 60ml syringe through the lateral window with the osteotomy blocked tightly with a sterile cotton pledget to facilitate one outlet for the implant; that is, through the lateral osseous window. Gravitational force was considered by placing the patient reclined on his right side, in the right lateral recumbent position so that the sinus was located on the underside. With the patient in this position the suction tip was introduced into the lateral window and then slowly withdrawn. The implant suddenly appeared through the window with the flow of saline. It was grasped with an Adson forceps (Salvin, Charlotte, NC, USA) and retrieved (Figure 3). The osteotomies were then covered with a resorbable collagen membrane (Biomend, Zimmer Dental, Warsaw, Ind, USA) and primary watertight closure was obtained with 4-0 mersilk suture material. Bone grafting was not performed because there was no intact sinus lining to contain the graft. The patient was prescribed an antibiotic (Amoxycillin 500mg) every 8 hours for 5 days, anti-inflammatory (Ketorolac 10mg) every 12 hours for 5 days and 0.12% chlorhexidine oral rinse for 2 weeks post-surgery. He was also instructed in coughing and sneezing techniques. The patient was instructed to open his mouth during coughing to avoid any nasal-antral pressure that might disturb the oral-antral closure. Eight months later he reported no residual symptoms.

DISCUSSION

Maxillary sinuses are located bilaterally in the maxilla with an ostium for drainage which in the majority of the cases is in the superior portion of the medial wall and usually it drains into the middle meatus of the nose. Sinus drainage is accomplished by action of cilia and small foreign bodies are easily removed by this ciliary action. A foreign body as large as a dental implant is too large to be evacuated by this natural phenomenon. The average volume of a maxillary sinus is about 15ml (range between 4.5 and 35.2ml) so a lavage of 25-30ml saline can easily be performed of the maxillary sinus.

Dental implants displaced into the maxillary sinuses have a propensity to get infected.[7] The bone in our case was not adequate to resist the implant advancement at the implant's fully seated position with the bone quality being fine trabecular. Immediate retrieval of the implant was performed

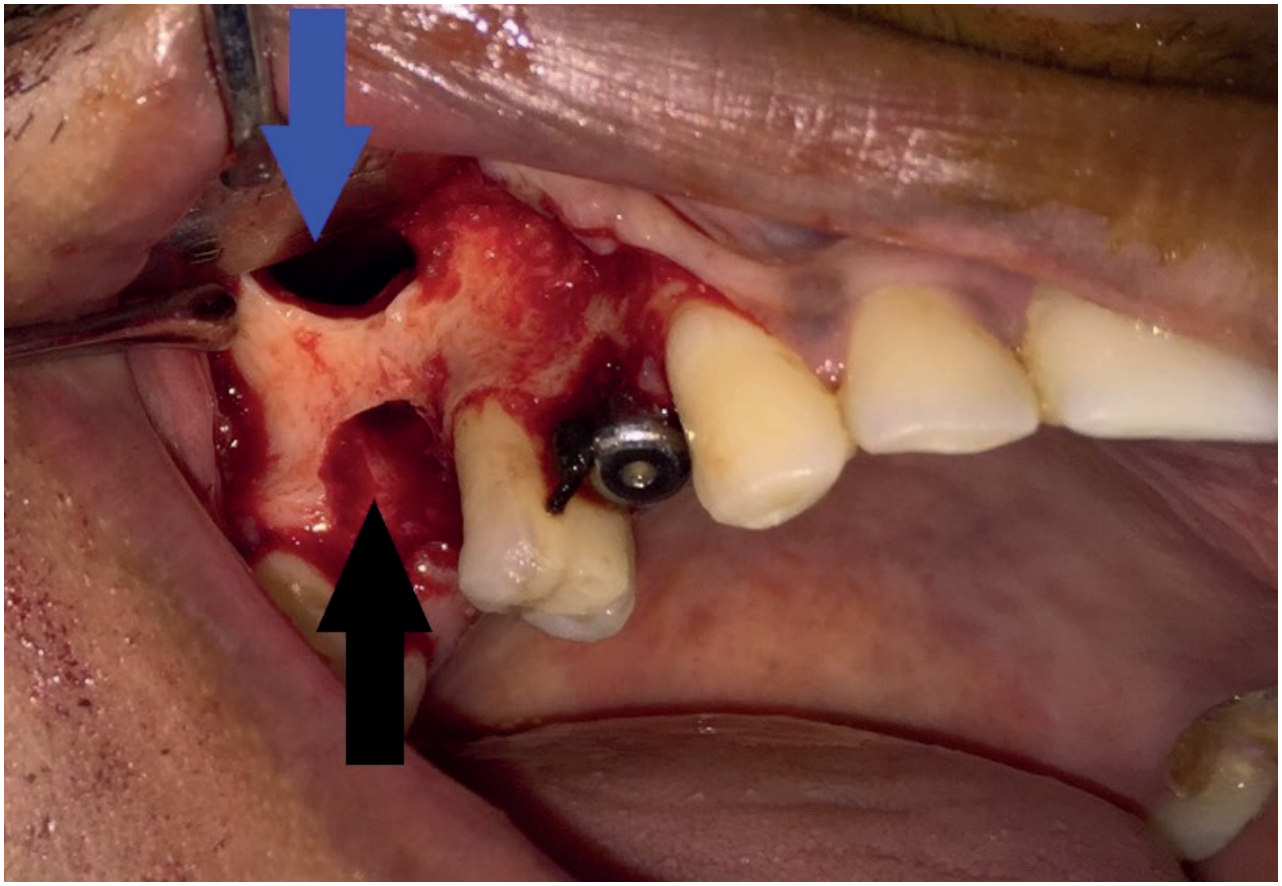

Figure 2: Creation of round lateral window (blue arrow) and initially created osteotomy (black arrow).

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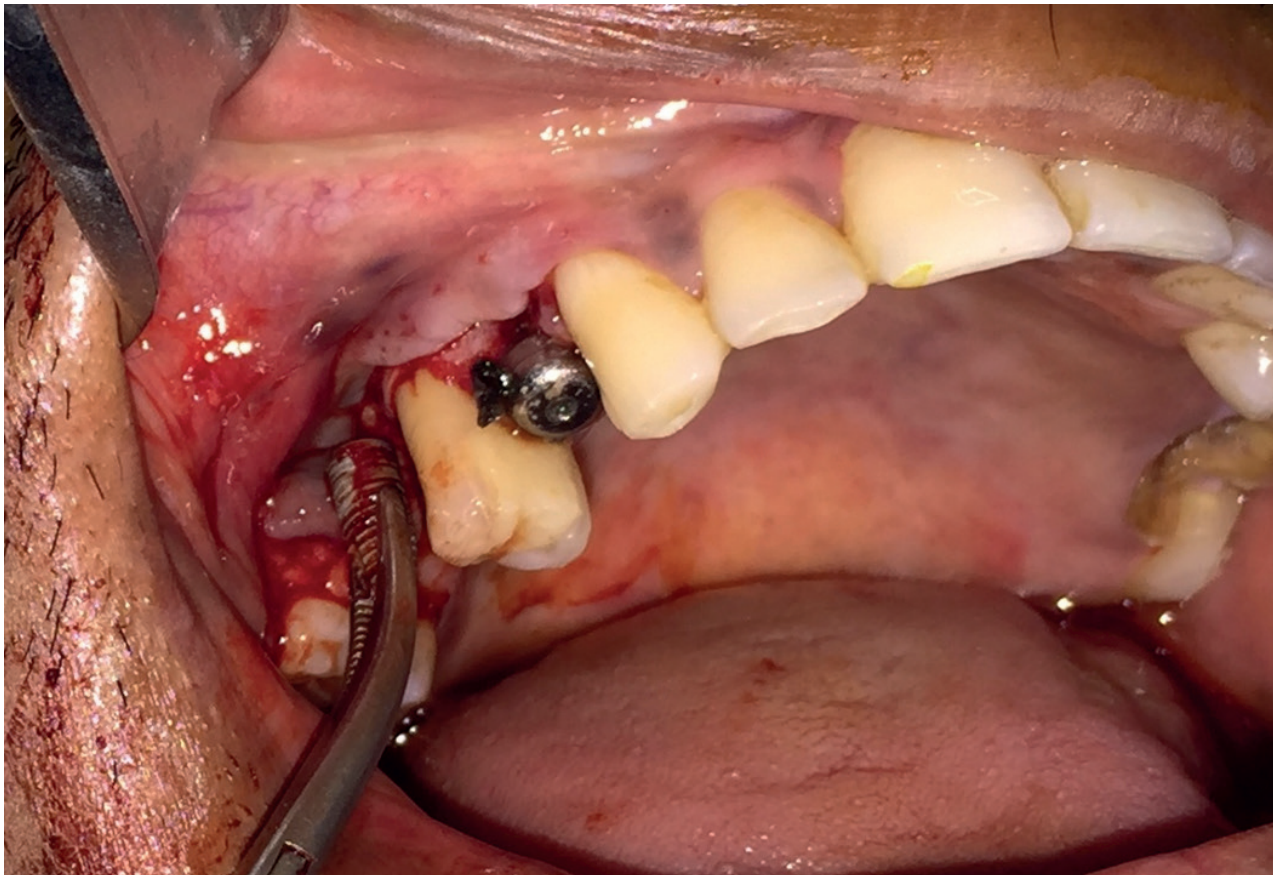

Figure 3: Retrieval of implant.

in our case as delaying the retrieval could allow the implant to migrate into an adjacent contiguous sinus.[8] There was one reported case in which the displaced dental implant migrated from a maxillary sinus to a sphenoid sinus due to delayed retrieval.[9]

The technique presented here utilises gravitational force, saline as a vehicle, tight-fitting suction tip in the surgically created lateral window and blockage of the crestal implant osteotomy which forces the implant only through the lateral window. This modified Caldwell-Luc technique preserves more bone by creating a smaller lateral window; also, the location of the window is more inferior to that of the traditional Caldwell-Luc which further aids in retrieving the displaced implant. The diameter of the window should be larger than the diameter of the displaced dental implant, taking care to prevent any damage to adjacent tooth roots. The use of this technique is a cost-effective way for management of the displaced dental implant in the sinus especially in dental operatories and countries where there is lack of sophisticated and expensive armamentarium such as an endoscope.

CONCLUSION

Although dental implants have become one of the predictable methods of teeth replacement, unavoidable complications during or after implant placement might occur. Clinicians should take all the necessary precautions to avoid untoward complications and still be prepared to manage complications should they arise. The present case report emphasises the management of displacement of the dental implant into the maxillary sinus in a cost-effective way.

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Conflict of interest

None

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What's new for the clinician – summaries of recently published papers (June 2023)

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Edited and compiled by Prof V Yengopal, Faculty of Dentistry, University of the Western Cape

1. Caries-preventive effectiveness of two different fluoride varnishes: A randomised clinical trial in patients with multibracketed fixed orthodontic appliances

There has been a huge increase in the number of adolescents and young adults on fixed orthodontic treatment for periods longer than 1 year. Often the desired outcome of having a perfectly aligned set of teeth has been marred by the significant increase in the presence of white spot lesions (WSLs). These lesions are commonly observed on the labial surfaces of the maxillary incisors adjacent to the brackets, thus jeopardising the final aesthetic result of the treatment and having limited chances of improvement even after the orthodontic appliances are removed.[1] The incidence and prevalence of WSLs during multibracketed fixed orthodontic treatment are relatively high with a wide range, and the problem is quite alarming for the orthodontists and patients.[1] Patients with multibracketed fixed orthodontic appliances have been considered to be at moderate to high risk for caries and various preventive strategies have been examined to prevent the development of WSLs, among which topical fluorides have been studied widely and found to be efficacious in reducing the incidence of WSLs around the brackets.[1] Among the various forms of topical fluorides studied, varnishes are deemed critical for preventing the WSL formation. The efficacy of topical fluoride varnishes has been established through multiple systematic reviews[1] with a preventive fraction of about 43% and 37% in permanent and primary dentitions respectively, compared with that in the placebo or no treatment.

Among the fluoride varnishes available commercially, Duraphat® varnish (Colgate-Palmolive) containing 5% sodium fluoride (NaF) (2.2% fluoride) is one of the most commonly used varnishes and has been reported to exhibit a substantial caries-inhibiting effect in both primary and permanent dentitions.[1] Clinpro™ white varnish (3M ESPE), another professionally applied topical fluoride agent commercially available, contains tricalcium phosphate (TCP) in addition to NaF and allows a higher concentration of calcium phosphate available for deposition on the enamel surface. It also contains a protective fumaric acid barrier to facilitate the coexistence of the ions of calcium and fluoride during storage, which breaks upon contacting with saliva, thus releasing the ions for effective remineralisation of the tooth.

Sardana and colleagues (2023)[1] reported on a randomised clinical trial that sought to compare the effectiveness of a traditional NaF varnish [Duraphat®] versus an advanced novel NaF varnish containing TCP [Clinpro™] in preventing WSLs among patients undergoing multibracketed fixed orthodontic treatment. The null hypothesis tested was that there is no difference between NaF varnish containing TCP and conventional NaF varnish in preventing WSLs during multibracketed fixed orthodontic treatment compared with standard oral hygiene instructions.

MATERIALS AND METHODS

The trial was conducted in Hong Kong where the communal drinking water is fluoridated at a concentration of 0.5ppm. Subjects about to undergo fixed orthodontic treatment were invited to participate in this study. Only those participants from whom informed written consent was obtained directly from the participants or their parents (if the participants were younger than 18 years) were included in the study. Participants were excluded if they had: history of fixed orthodontic treatment, any developmental defects of enamel on labial surfaces of teeth, any dental anomalies or direct/indirect labial restorations on teeth, history of long-term antibiotic usage, untreated cavitated lesions and/or plaque levels >25%.

The sample size required for this trial was calculated to be 90 (30 per group) but the final sample size was inflated to 99 to compensate for any dropouts.

This study was a single-centre equivalence randomised controlled trial with three parallel arms in which individual participants, not parts of the mouth, served as the unit of randomisation. Ninety-nine participants were randomly allocated into the following intervention groups:

Group A – control receiving standard oral hygiene instructions (OHI) every 3 months (n=33);

Group B – Intervention 1 received standard OHI along with the application of topical fluoride varnish containing 5% NaF (Duraphat® varnish) every 3 months (n=33); and

Group C – Intervention 2 received standard OHI along with the application of topical fluoride varnish containing 5% NaF + TCP (Clinpro™ white varnish) every 3 months (n=33).

The study participants were recruited after orthodontic assessment and screening had been completed for baseline assessment. One calibrated examiner performed the complete clinical examination using a dental mirror and a blunt straight probe. The examiner detected and scored WSLs based on the index proposed by Gorelick et al.[1] for 6 teeth (right maxillary canine, right maxillary lateral incisor, right maxillary central incisor, left maxillary central incisor, left maxillary lateral incisor and left maxillary canine): 0=no lesion; 1=slight lesion (linear shape); 2=severe lesion (band shape); and 3=cavitation.

Following the clinical assessment, standard digital photographs (frontal and lateral views of the teeth) were taken and stored for later comparisons. All the photographs

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were taken by the same digital camera (Nikon D5300 Digital Camera) by the same examiner to ensure that the reflection of the flash on the tooth was absent or minimal to avoid any misdiagnosis of flash as WSLs. The photographs in the JPEG (Joint Photographic Experts Group) format were later randomised and examined in a room with minimal light by two examiners blinded to the group interventions. The three photographs (one frontal view and two lateral views) were paired and evaluated to minimise any further error due to flash, as the three photographs provided different angles. The scoring of the photographs was performed according to the WSL index by Gorelick et al.

The visual examination of the tooth surfaces was followed by assessment using DIAGNOdent Pen 2190 (KaVo). Before any DIAGNOdent reading was taken, the teeth were gently cleaned for visible debris or plaque and dried to avoid false readings. Three readings were taken at the same appointment by a single investigator for the labial surface of each tooth (right maxillary canine, right maxillary lateral incisor, right maxillary central incisor, left maxillary central incisor, left maxillary lateral incisor and left maxillary canine) using tip number 2 of the DIAGNOdent pen, and the value of reliability was calculated. The maximum reading was recorded by tilting the DIAGNOdent probe at various angulations so that all the labial surfaces were covered. Three readings were taken for each tooth to ensure reliability, but the mean of the three readings was considered as the DIAGNOdent value of the tooth. Finally, the mean DIAGNOdent score of the patient was calculated depending on the number of teeth examined, and it was considered to be a final independent variable in the statistical analysis.

All the participants received oral prophylaxis with a rubber cup and fluoride-free pumice paste before the commencement of fixed orthodontic therapy. After the baseline assessment, the mid-buccal enamel of all the teeth was etched, and .022 edgewise orthodontic brackets were bonded. The bonding of the brackets was performed by four different orthodontists who were not involved in other parts of the trial and were masked to the intervention.

Immediately after bonding the brackets, all the participants from Group B received a topical application of Duraphat® varnish (containing 5% NaF) and participants from Group C received a topical application of Clinpro™ white varnish (containing 5% NaF and TCP). The respective topical fluoride varnish was applied on labial and palatal surfaces of all the teeth (including adjacent to the bracket bases) by an independent operator and allowed to dry for 2 min. Clinpro™ white varnish was applied using the brush supplied with the disposable packet for each patient, and Duraphat® varnish was applied using a similar brush as there was no brush provided with the pack. The patients were advised to avoid eating and drinking for 2 hours after the varnish application and after brushing their teeth until the following day. The participants allocated to Group A only received standard OHI. The patients were made aware of the aims and objectives of the study before the start; they were, however, not aware of their respective groups or other groups' allocation. All the interventions were repeated at quarterly intervals for the duration of follow-up and were coordinated with the patients' appointment with the orthodontist.

All the participants also received the diet instructions, standard oral hygiene instructions (OHI), including brushing methods during orthodontic treatment, and advice on toothbrushing twice daily with a fluoride dentifrice. To standardise the use of oral hygiene aids, all the participants received a standard dentifrice containing NaF (with 1500 ppm F) and a toothbrush. The compliance was checked by asking the patients to return the used toothbrushes and dentifrice tubes every 3 months and replace them with the new ones during the quarterly follow-up visits. To reduce the effect of confounding factors, the participants were asked not to use any other oral hygiene aids and fluoride-containing products until the completion of the study. Scaling was provided ad libitum to ensure an optimal periodontal status during orthodontic treatment; the scaling was, however, only limited to other areas of the oral cavity outside the area of interest of the outcome (ie the maxillary anterior area).

The follow-up evaluation of WSLs was performed at baseline (before bonding), post-bonding (after bonding of the maxillary arch) and every 6 months until 18 months using clinical examination, photographic examination and DIAGNOdent assessment. The same examiner performed all the assessments for detecting WSLs by direct visual examination and assessment of the labial surfaces of the teeth with DIAGNOdent pen; two examiners masked to the group interventions, however, evaluated the clinical photographs at the end of the trial.

The primary outcome was the odds of developing WSLs during orthodontic treatment among the participants undergoing multibracketed fixed orthodontic treatment using clinical visual assessment, photographic assessment and changes in the mean DIAGNOdent scores of the patients over 18 months post-bonding of the maxillary teeth. The secondary outcome was the distribution of WSL scores using visual assessment and photographic assessment in all three study groups at an 18-month follow-up.

RESULTS

Eighty-two patients were followed up until 18 months, and the remaining 17 were lost to follow-up due to the impact of the COVID pandemic. The distribution of age, gender, DMFT, WSLs and mean plaque index at baseline was similar across the three groups. It was observed that by the end of 18 months, 80.9% of the examined teeth were free from any WSLs in Group A, 90.7% in Group B and 88.1% in Group C when assessed clinically. The trend was almost similar when the teeth were assessed by photographs, with 81.6% being free of WSL in Group A, 89.5% in Group B and 85.7% in Group C at the end of 18 months. Also, there were a higher number of WSLs (score 2, severe) and cavitation (score 3) in Group A. The results were consistent with DIAGNOdent readings as Duraphat® provided slightly better protection than Clinpro™, followed by standard OHI.

The distribution of mean and median DIAGNOdent scores was also not significantly different across the three groups at various time intervals; the mean DIAGNOdent scores in the three groups, however, increased with the progress of orthodontic treatment. The values of the intra-class coefficient to measure the reliability of the three readings were found to be in the range of 0.66 (moderate) to 0.94 (excellent), depending on the teeth and time point. The values of sensitivity and specificity of DIAGNOdent using

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clinical diagnosis as a standard to detect WSLs at 6, 12 and 18 months were 0.783 and 0.828, respectively (p>0.05).

A logistic regression model with the intervention group, time intervals and intervention* time interaction was used for the evaluation of WSLs by clinical assessment and photographic assessment. Only the effect of time was, however, found to be significant ($p < .001$), whereas there was no significant difference among the three intervention groups ($p=.305$).

When diagnosed clinically, the odds of developing WSLs were reduced by 54% in Group C (odds ratio: 0.456, 95% C.I.: 0.166-1.255, $p=.129$) and 41% in Group B (odds ratio: 0.585, 95% C.I.: 0.180-1.900, $p=.373$), although the results were not statistically significant. Similar results were obtained in photographic evaluation ($p=.599$) among the three groups. The odds of developing WSLs increased significantly over time when evaluated clinically or photographically. There was no significant difference in the presence of WSLs among the three groups.

CONCLUSION

The study failed to demonstrate that the quarterly application of both the study varnishes with OHI provided additional benefits compared with standard OHI alone in preventing WSLs, taking the effect of time of follow-up into consideration. There were higher odds of developing WSLs with an increased duration of orthodontic treatment.

Implications for practice

Patients with multibracketed fixed orthodontic treatment are at an increased risk of developing enamel demineralisation. There are higher odds of developing WSLs with an increased duration of orthodontic treatment. The regular application of sodium fluoride varnish and sodium fluoride varnish containing TCP was found to have no statistically significant additional benefits compared with standard oral hygiene instructions in preventing WSLs over 18 months after the placement of brackets.

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2. Efficacy of two behavioural management techniques during inferior alveolar nerve block administration in pre-school children: a randomised clinical trial

The fear of dental injections among children is a well-known phenomenon in dentistry and often leads to non-cooperative behaviours during dental treatment. The Inferior alveolar nerve block (IANB) injection, frequently used for local anaesthesia in the mandibular jaw, can induce negative behavioural reactions and has been reported to be associated with increased levels of pain perception and dental anxiety in patients.[1]

Behavioural management techniques are widely used by dentists to alleviate discomfort caused by local anaesthesia injections and have been found to have good efficacy in the management of paediatric pain and distress when using psychological interventions.[1] Distraction techniques can shift the child's attention from perceived disagreeable procedures with strong published evidence in supporting the efficacy of these techniques for the reduction of pain and stress in children requiring treatment measures utilising needles.[1] Some randomised clinical trials have also demonstrated that distraction techniques are effective in managing dental anxiety, negative behaviour and pain in children older than 6 years of age receiving IANBs.[1]

IANBs can be a painful and stressful procedure for children, and a behavioural technique that prevents the patient from seeing the syringe carpule and dental needle by discreetly covering their vision and providing verbal explanations of the procedures can help minimise their anxiety. The current trial sought to use the hands-eyes-mouth distraction technique (HEM-DT) as a distraction technique, with the aim of shifting the patient's focus away from the dental needle puncture and preventing them from seeing the needle by asking them to perform a sequence of game-like movements. Therefore, the aim of this study was to compare the efficacy of the HEM-DT in reducing pain and anxiety levels and improving the behaviour of pre-school children during IANB administration to that of the covering patient's vision technique (CPV-T).

MATERIALS AND METHODS

This randomised clinical trial consisted of parallel groups and complied with the CONSORT regulations. The sample size of 52 (26 in each group) was calculated considering anxiety as the primary outcome.

A total of 63 children aged between 3 and 5 years 11 months were screened by an external researcher who reviewed their medical history and health status and carried out complete extra- and intra-oral examinations using odontograms, any necessary radiographic evaluations, calculation of the Silness-Löe oral hygiene index score and behavioural assessments.

The study included 52 children who spoke/understand Spanish/Valencian and had primary dentition with at least one inferior primary molar exhibiting a deep carious lesion with pulpal involvement requiring treatment under an IANB. Children exhibiting disruptive behaviour, intellectual disabilities, allergy to lidocaine, a history of previous treatment with local anaesthesia and systemic and/or neurological diseases were excluded from this study.

Randomisation was carried out using a sequence of numbers that were put into opaque envelopes and sealed by the external researcher. These envelopes were opened by the operator at the time of anaesthesia administration. Based on this, the study sample was divided into two groups based on the distraction technique used, as follows:

The hands-eyes-mouth distraction technique (HEM-DT) group (G1; n=26 children): In this technique, the operator asked the patient to perform a sequence of game-like movements to divert their attention away from the needle puncture and prevent them from seeing the needle. The sequence consisted of the child putting his hands on his belly, opening his mouth and closing his eyes for 3 sec. Prior to injection of the local anaesthetic, the operator taught the child a "game" for when "the sleepy water" was used, and the sequence was repeated once or twice until the patient had mastered it. Thereafter, the entire sequence was repeated with the same level of calmness and game-like tone of voice during IANB administration. Counting to three, the operator had 3 sec to puncture the area to be anaesthetised by introducing the needle no more than 1mm into the oral mucosa. Then, after number three, the assistant

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removed the light, the patient opened their eyes and the operator immediately began to explain to the patient that the "sleepy water" must be put in very slowly so that it did not bother them and their cheek "fell asleep".

Covering patient's vision technique (CPV-T) group (G2; n = 26 children): In this group, the operator explained to the child in a kind and calming way that "they would make their tooth go to sleep". During administration of IANB, the operator discreetly obscured the child's field of vision with a hand to prevent them from seeing the injection device and the needle, all the time maintaining eye and verbal contact with the patient and explaining that their cheek would "fall asleep".

For dental anxiety levels, the previously validated Facial Image Scale (FIS) comprising a line of five faces with expressions ranging from "very happy" to "very sad" (scores 1 and 5, respectively) was used to self-report dental treatment anxiety. Prior to treatment when the child was still in the waiting room, the external researcher asked them to indicate the face that best represented how they felt at the time. Heart rate (HR), a physiological indicator of anxiety, was recorded using a paediatric finger pulse oximeter on the index finger of their left hand. The child's hand was gently held during measurement to prevent accidental movement and minimise the risk of measurement errors. HR was recorded at baseline (before the injection); 30, 60, 90 and 120 sec into administration of the injection; and 60 sec after administration of the injection.

The control session was carried out seven days after administration of IANB, where the dental anxiety levels in groups G1 and G2 were assessed by the external researcher in the waiting room. The Frankl Scale was used to assess the behaviour exhibited by the patient during administration of anaesthesia. The scale is organised into four behavioural categories, as follows: (1) definitely positive, (2) positive, (3) negative and (4) definitely negative.

The Wong-Baker Scale was used to record the level of pain felt by the patient during administration of anaesthesia. This scale consists of a line of six faces with expressions ranging from "very happy" to "very sad" (scores 1 and 6, respectively). The child was asked to select the one that best represented how they felt during administration of the anaesthetic.All dental treatments were provided by the same experienced paediatric dentist (operator) over two sessions [treatment session: baseline/IANB; control session: 7 days after administration of IANB] carried out in the presence of the children's parents.

RESULTS

The study sample included 52 children (38 boys and 24 girls) aged between 3 and 5 years 11 months (mean age: 4.015; standard deviation: 0.809) who were divided into two groups (n = 26 children per group; G1:18 boys and 8 girls; G2: 10 boys and 16 girls). Regarding the distribution of the age groups, 30.76% (n = 16) of the study sample were 3 years old (G1:8; G2:8), 36.53% (n = 19) were 4 years old (G1:10; G2:9) and the remaining 32.69% (n = 17) were 5 years old (G1:8; G2:9). Twenty-four of the 52 IANBs administered were on the right side, while the remaining 28 were on the left side.

Although both groups exhibited low anxiety levels at baseline, the G1 group exhibited significantly higher values compared to the G2 group (G1: 1.38 ± 0.140; G2: 1.00 ± 0.00; p value = 0.01). The mean HR recorded at baseline were within the range considered normal (80-130 beats/min) for the age range of the study sample in both groups, and no significant differences in baseline HR were observed (G1:99.5 ± 11.82; G2:103.81 ± 13.84; p value = 0.233).

A significant increase in HR between the first and last measurements was observed in both groups (p value < 0.001). Moreover, the HR decreased during IANB administration in G1 (HR120 s – baseline HR = – 3.73) and increased in G2 (HR120 – baseline HR = 0.84).

No significant changes in HR were observed in either study group when examining children aged 3 years (p value > 0.05). When examining children in the 4-year age group, no significant changes in HR were observed in the G1 group during the first 60 sec of injection, while the G2 group exhibited a significant increase 30 (p value = 0.037) and 60 sec (p value = 0.019) into IANB administration. Similar findings were observed upon comparison of the baseline and final HRs in children aged 5 years (p value = 0.005). However, regardless of age, the mean HR was significantly lower in the G1 group compared to the G2 group throughout the duration of the procedure [HR30: p value = 0.009, HR60: p value = 0.008, HR90: p value = 0.009 and HR120: p value = 0.033]. No statistically significant differences in mean final HR were observed between the two groups (p value = 0.076). Both groups exhibited low pain levels (G1: 1.31 ± 0.884; G2: 1.46 ± 1.067) and no statistically significant differences were observed (p value = 0.348). Moreover, the patient's behaviours also did not significantly differ between groups G1 and G2 (p value = 0.474).

The mean dental anxiety levels at baseline and after 7 days were low in the G1 group and these values did not differ significantly (p value = 0.798). In the G2 group, the mean dental anxiety levels after 7 days were significantly higher (p value = 0.039) than those observed at baseline. No statistically significant differences in mean dental anxiety levels after 7 days were observed between groups G1 and G2 (p value = 0.936). Assessment of the study sample as a whole as well as by group showed that neither age nor gender were significantly associated with initial or final anxiety levels, self-reported pain or behaviour (p value > 0.05).

CONCLUSION

The findings of this study suggest that the hands-eyes-mouth distraction technique (HEM-DT) was more effective in controlling the anxiety levels of pre-school children during administration of IANB when compared to the Covering patient's vision technique (CPV-T). However, both techniques were equally effective in controlling pain and maintaining cooperative behaviour in the patient.

Implications for practice

While both techniques were equally effective in controlling pain and maintaining cooperative behaviour in the patient, for patients who demonstrate a high level of anxiety, the HEM-DT was superior.

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Professional virtues: illuminating the path to ethical research in oral health

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HD Miniggio[1]

INTRODUCTION

Ethical research is vital in pursuit of advancing scientific knowledge as well as promoting and improving oral health outcomes that are in accordance with the needs of communities. Guidelines, principles and duties outlined in various international and national professional associations serve to guide ethical research in healthcare, including oral health.

International guidelines, amongst others, the Belmont Report and the Declaration of Helsinki, specify several essential principles and numerous ethical guidelines to be adhered to by health researchers.[1,2] In like manner, local guidelines established by the Health Professions Council of South Africa advance the basic ethical principles in health research and the fundamental duties of healthcare researchers, namely "duties to research participants; duties to research colleagues and other professionals; duties to health researchers themselves; duties to society; duties to the healthcare profession; duties to animals and duties to the environment".[3]

These various international and national guidelines and ethical standards for health research are primarily constructed within a principle-based framework.[4] Although these numerous research guidelines and ethical standards in health research are indeed essential in guiding ethical research "scientific misconduct continues to be a problem".[5] "The most common forms of misconduct include fabricating the process and outcomes of research, and failure to protect human participants by giving them incomplete or inaccurate information about the risks of the research."[5,6]

In the vast landscape of research ethics, there is limited emphasis on the importance of supplementation of the principles and duties with professional virtues that are part and parcel of the research process. While ethical principles and duties provide an essential framework for guiding ethical conduct, they understate the significance of the development of the virtuous character of the researcher.

This article aims to initiate a meaningful conversation regarding the significance of cultivating professional virtues as essential components of ethical behaviour in the realm of oral healthcare research. More specifically, this article shows that professional virtues can supplement the principles of healthcare research and support the duties of the researchers by ensuring that these guidelines are not simply followed, but are understood as intrinsically valuable by researchers.

Furthermore, the professional virtues suggested in this article are intended to open a dialogue among oral health researchers regarding the types of professional virtues and excellence in research that they should strive towards and makes recommendations for mentoring these professional virtues in oral health research.

This article concludes that professional virtues have a meaningful role to play in ethical research discourse and mentoring, by illuminating the path to a deeper commitment to excellence in ethical research conduct.

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Virtue-based ethics

It is considered that virtue has a teleological function both in respect to the attainment of a fulfilled life as well as in the attainment of excellence in a professional context.[8] This teleological viewpoint has been applied to healthcare practice in the form of "an ethic based in the notion of the good as an end of moral acts wherein 'good' is defined in terms of the nature of the activity in question, that for which the activity exists".[8]

Aristotle, who is widely regarded as the forefather of teleological thinking, believes that every living being in the natural world instinctively strives to achieve a specific and intrinsic final purpose and, conversely, this final purpose is the ultimate good for all living beings.[9] Concerning the final purpose of human beings, Aristotle considers that this is to achieve a level of *eudaimonia*, generally understood as happiness but best interpreted to signify "a fulfilled life".[10] A characteristic aspect of Aristotle's moral argument is that people cannot achieve happiness and be accomplished in life if they do not develop certain virtues and, importantly, exercise these virtues persistently.[9]

Professional virtues

The term "virtue" finds its origins in the Latin word *virtus* which can be generally translated as excellence; for Aristotle this is *arête*.[9] "Virtue, therefore, refers to an excellence of its kind."[11] A virtue can be defined as "trait of character, manifested in habitual action, that it is good for a person to have".[12] In turn, traits of character can be defined as "relatively stable and enduring psychological dispositions or tendencies to act in characteristic ways".[11] "Since virtues are excellent traits of character, they are dispositions to act well" and these traits are distinct from "abilities, skills, talents and a person's temperament"; the opposite of virtue is considered vice.[11]

On such a teleological account, in which virtues are assumed from the supposed end for human beings, professional virtues are similarly assumed from evaluating

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the sort of character traits that assist professionals to meet the end(s) of the specific profession.[11] In other words, a virtue is defined as that quality that aids something or someone to fulfil their function well.[11] The virtues of a professional are those traits that allow them to fulfil their function(s) well, otherwise stated allows them to be a good professional.[11] This teleological perspective is useful in the context of healthcare practice and healthcare research as "it links moral excellence (the moral virtues) with the kind of person the physician should be and with the excellence of the work he does specific to his profession".[13] From such a perspective, "professional virtues are traits of character (or personality) that help a professional to serve a profession's purpose(s) well".[11] Spielthenner states that:

> Just as Aristotle's virtues are derived from an (assumed) end of human beings, so are professional virtues those character traits which a professional needs for serving the end of his profession. Calmness is arguably a virtue of airline pilots because it is needed when dealing with challenging weather conditions (being panicky would be a vice), and compassion is a virtue of doctors if this trait is needed to serve the goal of the medical profession well.[11]

In the context of research ethics, an appeal to the development of professional virtues is meaningful as it allows for a personal connection with the researcher.[4] "Personal and professional development consists in becoming a better person and a better scientist, not in internalising a long list of rules, duties and responsibilities: a virtue like honesty has a close connection to one's personal and professional life, whereas rules like 'conduct research in human beings only if the risk of the research are reasonable in relation to the benefits to the subject and society' does not."[4,14]

Some of the virtues that have been proposed as being important for researchers to develop and demonstrate during healthcare research are:

- "courage (standing up at the appropriate time for what one believes in despite some potential personal cost)"[4,14]
- "respectfulness (treating others with the respect they deserve)"[4,14]
- "resoluteness (staying with one's work, forging on despite difficulties, within the bounds of reason)"[4,14]
- "sincerity (being honest and truthful when appropriate, believing what you say)"[4,14]
- "humility (giving due weight to one's strengths and weaknesses)"[4,14]
- "reflexivity (being critical enough of one's work, making due allowances for one's own biases)"[4,14]

Other virtues that have been suggested as significant in assisting health researchers in striving towards excellence in research include:

- "fairness (treating people fairly)"[4]
- "openness (sharing knowledge and resources when appropriate)"[4]
- "resourcefulness (making good use of one's resources, finding new resources)"[4]
- "conscientiousness (taking due care in one's work, being meticulous in research)"[4]
- "flexibility (being able to change one's plans when necessary)"[4]
- "integrity (reasonably acting in accordance with one's values, avoiding hypocrisy)"[4]

At this juncture, it is important to highlight that the proposed list of professional virtues enumerated in this article are not meant as an exhaustive list, but are rather aimed at encouraging oral health researchers to reflect on the professional character traits they should aspire to exemplify.

Lastly, research has shown that the development and practice of these professional virtues is particularly valuable when it comes to mentoring upcoming researchers.[4] Resnik argues that mentors can assist students in appreciating the significance of fulfilling their duties as researchers and adhering to the principles and guidelines, thus fostering their growth as virtuous researchers.[4] He further considers that "scientific mentors can reflect upon the qualities of the virtuous researcher and try to help their students develop these traits".[4]

CONCLUSION

This article is intended to shed light on the significance of incorporating professional virtues in ethical discourse in the context of research in oral health. The list of virtues proposed in this article is intended to serve as a starting point to spark a dialogue about the various professional virtues and the pursuit of excellence in oral health research. Moreover, these professional virtues are meant to inspire reflection and understanding that the cultivation of professional virtues goes beyond adhering to ethical principles and guidelines; it involves the development of character traits that guide researchers towards excellence in ethical behaviour and fosters a culture of integrity within the research community. By initiating this conversation about professional virtues, this article emphasises that a broader exploration of the qualities and values in research illuminates the path and contributes to ethical research practices and propels researchers to strive towards excellence.

Future research on professional virtues for oral health researchers should ideally be conducted through empirical studies involving oral health researchers themselves. This can provide valuable insights into the specific professional virtues relevant to the field of oral health.

Finally, the cultivation and ongoing refinement of the professional virtues in health research may serve as an added safeguard against engaging in unethical research behaviour.

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Maxillofacial Radiology 205

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Lené Merbold[1], Chané Smit[2], André Uys[3]

Panoramic radiograph at initial presentation (Fig.1).

CASE

A 13-year-old male patient presented with a painless expansile swelling of the anterior mandible. Radiographic examination showed a unilocular radiolucent lesion resulting in bony expansion and teeth displacement (Figure 1). The lesion was biopsied and histological examination showed a conventional ameloblastoma. The lesion was marsupialised and was followed up over a period of 96 months (Figure 2-5). Subsequent signs of bone fill and absence of the lesion was noted for the follow-up period of 12 months (Figure 3). The lesion, however, recurred after 68 months with greater amounts of expansion compared to the initial presentation (Figure 4,5).

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1. Lené Merbold	Primary author	50%
2. Chané Nel	Primary author	30%
3. André Uys	Secondary author	20%

INTERPRETATION

Ameloblastoma (AB) is a benign odontogenic neoplasm arising from epithelial remnants of the dental lamina. ABs can be roughly divided into conventional and unicystic variants. Unicystic ABs present as a unilocular radiolucency on radiographic examination. Conventional ABs can appear as either uni- or multilocular radiolucent lesions.

The treatment of AB is controversial. There are two main surgical approaches, conservative and radical. The former involves marsupialisation/enucleation/curettage of the bony cavity, while radical surgery includes surgical resection with 1-2cm clear bony margins. The margin marked for resection is defined as the distance from the radiologic margin predicted to be disease-free. This is suggested due to the bony infiltration of neoplastic cells beyond the radiologic margins.

The luminal and intraluminal histological variants of unicystic ABs may be managed with conservative treatment. However, due to tumour infiltration beyond the radiological margins in mural unicystic and conventional ABs, treatment of choice is radical-wide surgical excision.

Patients who receive conservative treatment for conventional ABs have a higher propensity for recurrence (90%) than those who receive radical treatment (5%). Post-operative follow-up for all AB cases is critical as more than 50% of recurrences can occur five years post-treatment, with some presenting as early as two years after surgical intervention.

The current case highlights that histological diagnosis and subtyping is essential before the initiation of treatment.

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Marsupialisation and enucleation of conventional ABs result in remnants of neoplastic cells even in the absence of radiological signs of disease. Due to the high recurrence rates and the possibility of malignant transformation, resection is advocated for conventional ABs.

Conflict of interest

All authors have indicated they have no potential conflict of interest and no financial relationships relevant to this article to disclose.

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Ethics

The study was conducted following approval by the Faculty of Health Sciences Research Ethics Committee, University of Pretoria (571/2021). All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008. This article does not contain any studies with animal subjects performed by any of the authors.

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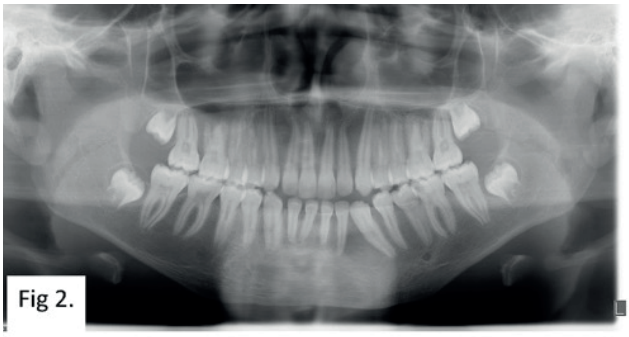

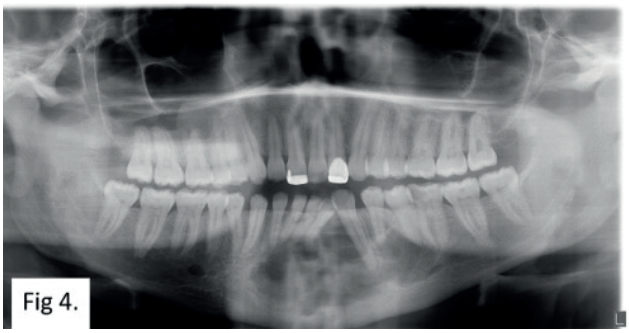

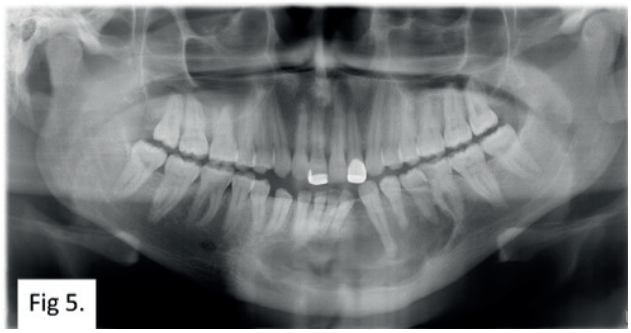

Panoramic radiographs after 7 months (Fig.2), 12 months (Fig.3), 84 months (Fig.4) and 96 months (Fig.5).

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CPD questionnaire

Knowledge, attitude and perceptions of dental professionals on patients seeking oral health care from traditional healers in Kwazulu-Natal, South Africa

1. **Choose the CORRECT statement**
   - A. The general and oral health needs of South Africans exceeds the public health system
   - B. The South African public health system has enough resources to offer oral health care in rural communities
   - C. Traditional healers have formal medical and scientific training
   - D. Majority of dental professionals are employed in the public sector

2. **Which of the following statements is CORRECT**
   - A. The participants were Dentistry students based in Sefako Makgatho Health Sciences University and the University of KwaZulu Natal
   - B. The participants were qualified dental professionals, practicing in KZN district hospitals
   - C. The participants were qualified dental professionals in the public and private sector, specifically practicing in rural KZN
   - D. Group discussions were held with the participants

3. **Which is the CORRECT statement**
   - A. More than 80% of participants indicated that it was important to consider the patients' belief system at all times
   - B. The study showed that oral health has no impact in the overall quality of life
   - C. All participants indicated that they had no interest in learning more about the traditional health practice and its role in oral health
   - D. Just above 30% of participants indicated that the traditional health practice had ideas and methods that the oral health fraternity could benefit from

Retrieval of displaced dental implant in maxillary sinus by modified Caldwell Luc technique.

4. **Select the CORRECT answer. The average volume of a maxillary sinus is**
   - A. 1ml.
   - B. 15ml.
   - C. 40ml.
   - D. 50 ml.

5. **Choose the CORRECT option. Which imaging technique is most helpful in localizing the displaced dental implant in the maxillary sinus.**
   - A. Cone Beam Computed Tomography.
   - B. Periapical radiographs.
   - C. Panoramic radiography.
   - D. Bitewing radiographs.

Final year oral hygiene and dental therapy students' perceptions of teaching and learning at a South African university

6. **Which of the following is CORRECT. Which of the following characteristics of training staff were regarded as ideal by participants of previous studies?**
   - A. Organisation
   - B. Rapport and enthusiasm
   - C. Patience
   - D. Provision of feedback
   - E. All of the above

7. **Select the CORRECT answer. Participants regarded which of the following teaching methods as most influential on their academic performance?**
   - A. The use of videos
   - B. Preclinical demonstrations
   - C. Lectures
   - D. Case-based learning

8. **Which option is CORRECT. Concerning the use of e-learning, students were most commonly affected by the following:**
   - A. Limited access to a laptop/computer
   - B. Difficulties with the e-learning website
   - C. Poor network and connectivity
   - D. All of the above

Measurements of tongue strength in adults after partial glossectomy

9. **Choose the CORRECT answer. What is the most common indication for a glossectomy?**
   - A. Trauma
   - B. Stroke
   - C. Cancer
   - D. Rehabilitation of taste/sensation

10. **Choose the INCORRECT option. Which one is NOT a subjective measurement of tongue strength?**
    - A. IOPI Device
    - B. Range of motion
    - C. Severity of dysphagia
    - D. Patient report of tongue strength

11. **Select the CORRECT statement. What were weaknesses of the study conducted?**
    - A. All studies had small sample sizes and thus data was not transferrable
    - B. None of the studies used objective measures to evaluate tongue strength
    - C. A scoping review may miss relevant studies
    - D. Both A and C

Learning experiences of undergraduate first year dental and oral hygiene students at a South African Dental University

12. **Which of the following is CORRECT. Although students reported they experienced pressures transitioning into a university environment, many had positive expectations regarding the university. What were some of these positive responses when referring to the university?**
    - A. Institution with a good system
    - B. Social atmosphere
    - C. Vibrant campus
    - D. All of the above

13. **Select the CORRECT statement. Students commented they struggled to adjust and to keep a balance between academic and social life. Which were the most important factors that contributed to them not being adequately prepared for the workload at a tertiary level?**
    - A. Funding
    - B. Study methods
    - C. Transport
    - D. Social life
    - E. A. and C.

14. Which of the following options is CORRECT. Students listed a variety of coping mechanisms that helped them deal with the workload when attending a tertiary institution. Which of the following was most commonly used as a coping mechanism?

A. Utilizing tutoring classes
B. Attending only those classes that were considered important
C. Limited or no participation in online lectures due to data issues
D. Getting more sleep
E. Spending more time with friends

Radiography corner

15. Choose the CORRECT answer. What is the origin of Ameloblastoma?

A. Osteogenic
B. Odontogenic
C. Haematogenic
D. None of the above

16. Select the CORRECT option. What is the suggested treatment for conventional Ameloblastoma?

A. Enucleation
B. Curettage
C. Marsupialisation
D. Surgical resection

17. Which of the following is CORRECT. Which histological subtype of Ameloblastoma can be treated with conservative treatment?

A. Luminal variant
B. Intra-luminal variant
C. Conventional variant
D. Both a and b

Evidence-based Dentistry

18. In the Sardana et al., RCT that had a parallel design, which of the following statement is CORRECT

A. All 3 arms of the study received Duraphat
B. The control group received Clinpro
C. There was 3 groups and each group received only one of the three interventions
D. The unit of interest was the tooth

19. Select the CORRECT statement. In the Sardana et al RCT, the findings suggest that

A. Duraphat application every 3 months + OHI offered the most protection against WSLs compared to the other 2 interventions
B. ClinPro application every 3 months + OHI offered the most protection against WSLs compared to the other 2 interventions
C. The control intervention offered the least protection compared to the other 2 groups
D. The null hypothesis of equivalence was proven

20. Select the CORRECT statement. In the behavioural management trial, which of the following statements is true

A. The hands–eyes–mouth distraction technique (HEM-DT) was more effective for pain compared to the Covering patient's vision technique (CPV-T)
B. The hands–eyes–mouth distraction technique (HEM-DT) was more effective for anxiety control compared to the Covering patient's vision technique (CPV-T)
C. Both techniques were equally effective in controlling pain and anxiety and maintaining cooperative behaviour in the patient.
D. Both techniques were not effective in controlling and maintaining cooperative behaviour in the patients

Ethics

21. Select the CORRECT answer. The following characteristics are true of professional virtues:

A. These represent traits that are specific to a professional's skills
B. These represent traits of character that are specific to meeting the goals of a particular profession
C. These represent traits that are specific to a professional's talents and temperament
D. All answers are correct

22. Which of the following is CORRECT. A virtue-based ethical account is particularly helpful in oral health research in the following ways:

A. It assists in the development of virtuous oral healthcare researchers
B. It assists in structuring a set of duties and principles that oral health researchers should follow
C. It encourages oral health researchers to reflect on the professional character traits they should aspire to exemplify.
D. All answers are correct
E. Answers A and C are correct

23. Which statement is CORRECT. Professional virtues in the context of oral health research should:

A. Supplement the principles of healthcare research
B. Be incorporated in mentoring future oral healthcare researchers
C. Replace the principles of healthcare research
D. All answers are correct
E. Answers a and b are correct

24. Which statement is CORRECT. A virtue-based ethical theory has as its central focus:

A. Duties of healthcare practitioners and researchers
B. Principles to be followed by healthcare practitioners and researchers
C. The character of the healthcare practitioner and researcher
D. All answers are correct
E. Answers a and b are correct

25. Select the CORRECT option. A teleological virtue account focuses on:

A. Deriving virtues from evaluating the character traits that assist professionals to meet the goals of the specific profession
B. Deriving virtues from evaluating the duties and responsibilities of professionals
C. Deriving virtues from evaluating the principles of healthcare ethics specific to the profession
D. All answers are correct
E. Answers a and b are correct

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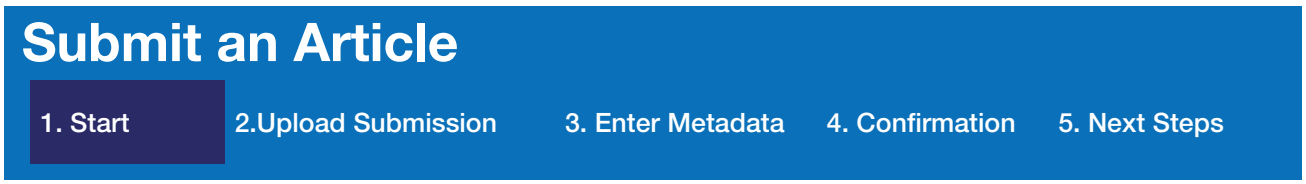

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