Projected speciality career choices among undergraduate dental students in Scotland

Y. Lee[1] and A.J. Ross*[1]

In brief

Provides information regarding dental undergraduates' specialty interest, the reasons for it and at what stage it occurs.

Informs undergraduate students regarding career pathways and options available.

Makes recommendations regarding curricular design and provides information regarding the stage students wish to be exposed to specialty information.

Background Despite increased numbers of dental specialists, around 90% of dentists in the UK continue to work in general practice. Previous research shows that undergraduate students indicate interest in speciality careers, however few studies have explored which specialties are of interest, when and why. The aim of this study was to explore whether Bachelor of Dental Surgery (BDS) undergraduates attending Glasgow Dental School (GDS) indicate a desire to pursue a speciality career, why, and the extent to which they feel prepared in this regard. **Method** We conducted an internet-based survey (response rate 81%; n = 331) of all GDS students between October and November 2016. **Results** One hundred and eighty-six students (56%) had decided to specialise. Seventy-eight percent of these students cited enjoyment of that service, or types of patient seen, as the single most influencing factor on their choice. Oral surgery was the most popular choice where one was indicated (35%), followed by orthodontics (26%). Just 14% of BDS4-5 students felt sufficiently exposed to cases in their chosen speciality. A large majority (88%) said they would like information regarding speciality pathways at BDS3 or before. **Conclusions** Educators should provide undergraduate students with information about specialties in a structured way, so that they can consider available options.

Introduction

Postgraduate dental training in the UK

Dental graduates in the UK undertake Vocational (Foundation) Training (VT) which is a mandatory one year programme for those wishing to be eligible to work in the general dental service or public dental service (PDS). Dental core training (DCT) is a further period of postgraduate development that extends from the end of VT to the start of general practice or other career options, one of which is to enter further speciality training, and there are over 400 trainees across 13 specialities at any given time.[1]

The number of specialists registered with the General Dental Council (GDC) in the UK has increased from 3,168 at the end of 2007 to 4,347 at the end of 2014[2] with steady growth across a range of disciplines.[3,4] Similar rises have been reported internationally.[5–7] Speciality training periods vary from 3-5 years; in Scotland there are current programmes in dental and maxillofacial radiology, dental public health, endodontics, oral and maxillofacial pathology, oral medicine, oral surgery, orthodontics, paediatric dentistry, restorative dentistry and special care dentistry.

Despite these growing opportunities, around 90% of UK dentists work in general practice. This contrasts markedly with the consistently high proportion of dental undergraduates (figures as high as 92% have been reported worldwide)[8] who express early interest in specialising, far outstripping their eventual uptake of speciality posts.

Undergraduate provision

Undergraduate experience is known to be an important part of the progression to speciality employment and graduates may already have a clear idea of which speciality they wish to enter.[9] However, there are reports that undergraduate exposure, for example in such areas as orthodontics and oral surgery, is lacking.[10] Relatively little is known about the views of dental undergraduate students around future speciality training possibilities after VT, the stage at which interest emerges, or the key factors that influence speciality choice.[11] It has been posited in the literature that understanding such factors is important 'to enhance mentoring and counselling efforts for students about career pathways and help postgraduate programme directors attract the most suitably matched candidates for available positions'.[12]

A longitudinal survey in the USA suggests that financial considerations, enjoyment of particular types of clinical care, and exposure to educational role models/mentors may be the main factors that drive dental undergraduates' speciality preferences.[13]

A number of studies of medical undergraduates in relation to oral and maxillofacial surgery (OMFS) describe a need for increased emphasis on teaching at undergraduate level.[14] Jarosz *et al.* found that student perceptions, for example as to what procedures OMFS specialists would carry out, changed over time, with implications for OMFS and periodontal rotations.[15]

[1]Glasgow Dental School, School of Medicine, College of Medical, Veterinary and Life Sciences, University of Glasgow, 378 Sauchiehall Street, Glasgow, G2 3JZ, UK
*Correspondence to: Dr Al Ross
Email: alastair.ross@gla.ac.uk

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Aims

The aim of this paper was to fill a gap in the literature by gathering data on the stage at which UK dental undergraduates indicate a wish to specialise (or otherwise), the reasons for their choices, and their reported preparedness for future speciality training they might undertake so as to make recommendations for curricular design. A further aim was to examine if there were any interactions with regard to gender, reported ethnicity or undergraduate year/stage.

Methodology

Design

This study was a single site, anonymised, cross sectional online survey of the undergraduate population (Bachelor of Dental Surgery [BDS] years 1-5) at Glasgow Dental School, undertaken between October and November 2016.

Study site

Established in 1879, Glasgow Dental Hospital and School delivers a modern, integrated Bachelor of Dental Surgery (BDS) programme over five years to an undergraduate population of approximately 400 students. This is the second largest dental school in the UK, and also provides postgraduate research opportunities and taught postgraduate programmes in a range of subjects.

Procedures

An internet-based survey programme (Google Forms) was used to deliver the survey. We collected basic participant information including gender, age group, class year, time taken between college/high school and dental school, and self-reported ethnicity. All registered undergraduates were sent an e-mail containing the survey link, together with a covering letter explaining the purpose of the study and a statement ensuring confidentiality. A follow up e-mail was sent after one week to encourage participation, after which no further contact was made.

Participants could leave blank any question they did not wish to answer, and fully anonymous responses were permitted. Students were given the opportunity to provide a contact email to enter a prize draw, in which case responses were potentially identifiable, but all were dis-identified on transfer to databases for analysis, with participants allocated a unique study ID to ensure confidentiality.

Analysis

Data from returned survey forms were transferred to IBM SPSS v22.0 for statistical analysis. Descriptive statistics are reported for nominal variables, with one-sample Chi square tests for equality of proportions. Chi square tests of association were performed for contingency tables providing all expected cell frequencies were >5.

Table 1 Participating students (n = 331) and responses to the main survey items

Response item	Total n	Responses (%)					X^2; df (p)
Gender	331	Male 163 (49%)	Female 168 (51%)				0.076; 1 (0.783)
Age	331	16-20 152 (46%)	>21 179 (54%)				2.20; 1 (0.138)
Class year	331	BDS1 62 (19%)	BDS2 60 (19%)	BDS3 69 (21%)	BDS4 85 (26%)	BDS5 55 (17%)	8.19; 4 (0.085)
Ethnicity	331	White 258 (78%)	Other ethnic group 73 (22%)				103.39; 1 (0.000)
Time taken between college/high school and dental school	331	Straight from school 267 (81%)	Gap before GDS 64 (19%)				769.95; 1 (0.000)
Have you decided to specialise or wish to pursue a career in specialty training?	331	Yes 186 (56%)	No 145 (44%)				5.08; 1 (.024)
When did you begin to develop an interest in that specialty?	184*	Before university 88 (48%)	During university 96 (52%)				.35; 1 (.555)
At which stage do you feel you should first be exposed to information and background knowledge regarding the different types of specialties and their pathways?	331	BDS1 108 (32%)	BDS2 80 (24%)	BDS3 106 (32%)	BDS4 28 (9%)	BDS5 9 (3%)	124.67; 4 (.000)
[Those indicating speciality choice] ***Do you have knowledge regarding the career path that leads to the field of specialty you are interested in?***	186	Yes 53 (28%)	Not sure 80 (43%)	No 55 (29%)			7.22; 2 (.027)
[BDS 4/5 students indicating speciality choice] ***Do you feel you have been sufficiently exposed to the complex and multidisciplinary cases treated in that specialty?***	81	Yes 11 (14%)	Not sure 20 (25%)	No 50 (62%)			30.89; 2 (.000)

*Two missing

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Results

A total of n = 331 students completed the online survey, a response rate of 81%. Demographic information and key responses are shown in Table 1.

Table 1 shows students were split equally between male and female, and a good spread of class groups and younger/older students were represented. The majority of students were white (p =.000) and had come straight from school (p =.000), which is representative of the general cohort of UK dental students.

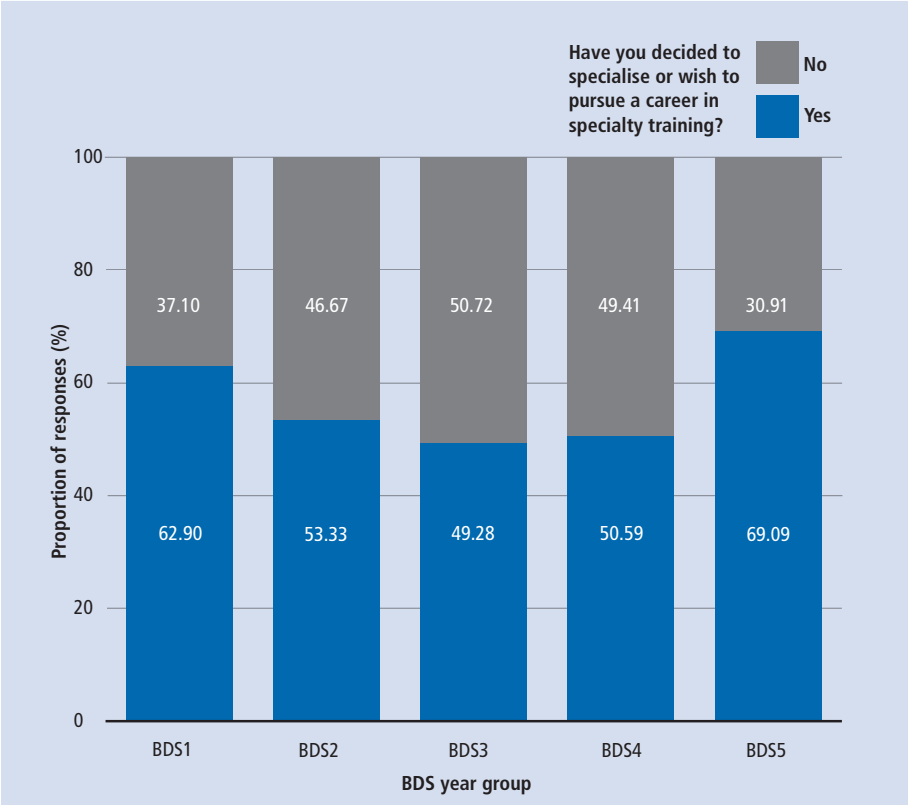
A small majority (56%; p = 0.024) indicated a preference for specialising. However most of these students (72%) reportedly did not have knowledge regarding the career path that leads to their indicated speciality or were not sure (p = 0.027). Responses from students in final years of dental school (BDS 4/5) showed 62% felt insufficiently exposed to the complex and multidisciplinary cases treated in their preferred speciality with another 25% not sure (p =.000).

There were no differences in levels of decision to pursue a speciality in either students coming to study straight from school versus gap years/second degrees, nor across ethnic grouping.

Figure 1 shows year group responses for the question of pursuing speciality training.

Speciality preference was highest in BDS 1 (63%) and BDS5 (69%), and somewhat lower in BDS 2-4 though not significantly so (range 49-53%; X^2 7.5; p =.113). For age group, decision to specialise was indicated at 52% of 16-20-year-olds, 62% of 21-25-year-olds and 33% of those over 26 (X^2 6.69; p =.035).

Fig. 1 Students indicating a preference for speciality training by BDS year group



Speciality choices

Overall, 63% of males (104/163) and 49% of females (82/168) surveyed said they had decided to specialise, or pursue a career in speciality training (OR = 1.85; CI 1.19-2.87). Specific choices by gender are shown in Table 2.

Almost half of students (78/185; 42.2%) indicating a speciality decision said they were not sure what speciality to pursue. Females were relatively more likely to state an interest in special care dentistry (6.2% to 1% of males) and paediatric dentistry (14.8% to 7.7% of males), and males in orthodontics (16.3% to 13.6% of females) and oral surgery (22.1% to 17.3% of females) though the latter was also the most common choice for females. There were very low indications towards oral medicine, oral and maxillofacial pathology, and academic dentistry.

Students indicating a speciality choice were asked when they had begun to develop an interest in that speciality. Around half (48%; 88/184; two missing) said they had made this decision before university (Table 1). There were no significant interactions with gender or ethnicity in this regard, though female students (44%, to 51% of males) and white students (47%, to 53% of other ethnic groups) were slightly less likely to have decided before commencing undergraduate study.

While numbers are relatively small, there was a difference across year groups. Orthodontics was the top choice for BDS 1 (23% of those choices) and BDS 2 (19%), and oral surgery for BDS 3-5 (21%, 23% and 24% respectively). This may reflect exposure in the undergraduate curriculum (see discussion). For orthodontic interest, 75% (21/28) indicated this began before university while for oral surgery this figure was 35% (13/37; OR 2.74; CI 1.35-5.5).

The main factors influencing undergraduate choice are shown in Figure 2.

Figure 2 shows that 78% of students choosing to pursue a speciality (145/185; one missing) cited 'enjoyment of providing that type of speciality service' or 'types of patient seen in that speciality service' as the single most influencing factors on their choice. All other reasons were cited by fewer than 10% of students, including exposure before dental school (8%), staff influence (7%) or future salary (5%).

Exposure to speciality information and preparedness

Figure 3 shows male and female responses to the question of when information on speciality careers should be introduced to undergraduates.

The majority of students (89%; 294/331) said they felt they should first be exposed to 'information and background knowledge regarding speciality pathways' at BDS 3 or before. Once more there was a gender effect, as 41% of male students felt exposure should start at BDS 1 compared with just 24% of females. This was reversed in BDS 2 (33% of females and 15% of males) with proportions for BDS 3 and above being similar (X^2 = p=.001).

Of the 186 students indicating speciality preference, 53 (28%) thought they had knowledge of the career path to that speciality, with 55 (29%) saying no, and 80 (43%) not sure (Table 1; P <0.05).

As indicated in Table 1 responses from students in BDS 4/5 reveal just 14% of students said they have been sufficiently exposed to the complex and multidisciplinary cases treated in that speciality (p = 0.000). This group were also asked how well prepared they felt in that speciality 'currently or upon graduation' (on a scale of 1-5 from 'not prepared at all' to 'very well prepared'). No students scored 5/5 on the

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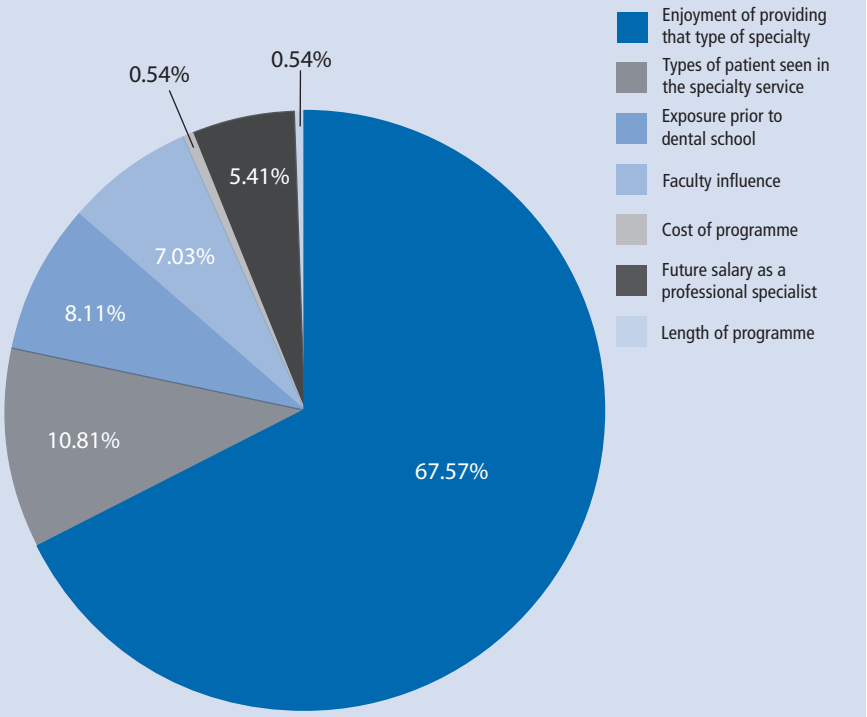
Fig. 2 Single most influencing factor on students' speciality preferences



preparedness scale (mean 2.54; SD.77), and just nine students scored 4/5. Sixty-six students (84% of 79, two missing) scored either 2/5 (47%) or 3/5 (37%).

Discussion

Our data show a majority of undergraduate students indicated a wish to pursue speciality training. The proportion (highest at 69% in BDS 5) is not as high as sometimes reported, however this still far outstrips the eventual number that will take up training places. This reflects a difference between societal need (and subsequent provision to match that need), and student early career interest, as has been previously pointed out in medicine.[16]

Even though referral rates to dental specialists have increased greatly in recent years and are likely to continue, it is not certain in the future if there will be growth of specialist care in the private sector. Primary care 'generalists' provide most dental care. Additionally however a significant amount of secondary care is provided by non-consultants outside of hospitals, and indeed some 'routine' work, without referral, can be considered relatively specialised (for example, in orthodontics and endodontics).[17]

Speciality interest is relatively (though not significantly) high upon entry (BDS 1, 63%), and exit (BDS 5, 69%), and lower in the intervening years (49–53% in BDS 2-4). Further investigation is necessary to explore this, but it is plausible that the pressures of undergraduate study lead this to be set aside somewhat during the middle years.

The increase in dental specialist registered with the GDC is reportedly highest in orthodontics and oral surgery,[2] which matches the most commonly indicated preferences in our data. There was also a shift in speciality interests from orthodontics in BDS 1/2 to oral surgery in BDS 3–5. It is likely that this reflects the curriculum, as GDS exposes undergraduate dental students to oral surgery from BDS 2 onwards. Students attributed their choices to many factors, including but not limited to personal factors (including familial exposure), mentoring and staff influence, and future projected salaries and working life factors. However, it is clear that (enjoyment of) exposure to relevant material and cases was a key driver. Persistent exposure and guidance in a certain subject, besides allowing students to grasp a deeper understanding and nature of the speciality, is a significant factor in sparking students' interests in that particular field.[18]

Not a single student in the present cohort indicated interest in specialties: prosthodontics, endodontics, periodontics, dental public health, dental and maxillofacial radiology, or oral microbiology. Exposure to (and interest in) some of these specialties will of course develop after graduation. As well as Vocational Training, Dental Core Training in Scotland involves six months in the public dental service and six months in hospital service. Trainees may also undertake examination towards Membership of the Faculty of Dental Surgery (MFDS) or Membership of the Joint Dental Faculties (MJDF), which are desirable for those pursuing speciality pathways.

It has been noted that speciality knowledge in oral and maxillofacial surgery is reportedly higher in dental undergraduates in the UK, compared to their medical counterparts.[19,20] Our highest preference towards speciality training was seen in BDS 5 students, yet these students felt mainly unprepared and under exposed across all specialties. This may be important to address because it is known that dental students already feel high stress levels at their final year of dental school or at the transitioning phase to clinics.[21]

Undergraduate educators in the UK should ensure students have realistic career expectations, and should make it clear most will work in general practice. Nevertheless, the majority of our students indicated that early exposure to knowledge about speciality pathways is desirable. Financial implications should be discussed with students, who it is estimated may be up to approximately £45,000 in debt upon graduation. Unless a competitive NHS specialist training post is secured, they will have to incur further debt to train as a specialist.[22] There have been various predictions for some time of shortages, including in the USA, of prosthodontists over the coming years,[23] and it seems to follow that, at least, undergraduate students should be informed about, and involved in discussing, when speciality-specific exposure might be expected. It is otherwise possible that we are missing an opportunity to engage the students who may ultimately be best suited to particular career paths.[24]

We also reported gender differences that may be of some interest, with paediatric dentistry and special care dentistry being relatively more favoured by female undergraduates (males are more likely to pursue orthodontics or oral surgery). This is consistent with previous work done with medical students in Israel which found that paediatric work appeals more to females.[25]

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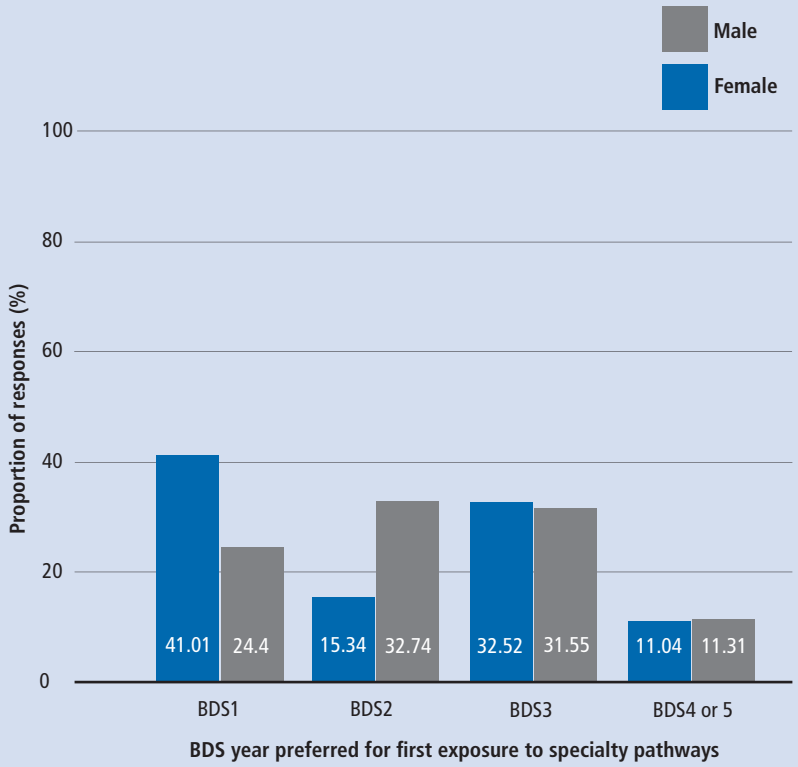
Table 2 Speciality choices by gender

Specialty	Male (%)	Female (%)	Total (%)
Special care dentistry	1 (1%)	5 (6.2%)	6 (3.2%)
Restorative dentistry	6 (5.8%)	3 (3.7%)	9 (4.9%)
Paediatric dentistry	8 (7.7%)	12 (14.8%)	20 (10.8%)
Orthodontics	17 (16.3%)	11 (13.6%)	28 (15.1%)
Oral surgery	23 (22.1%)	14 (17.3%)	37 (20%)
Oral medicine	2 (1.9%)	1 (1.2%)	3 (1.6%)
Oral and maxillofacial pathology	0	2 (2.5%)	2 (1.1%)
Yes but not sure what	46 (44.2%)	32 (39.5%)	78 (42.2%)
Academic dentistry	1 (1%)	1 (1.2%)	1 (1.2%)
Total	**104**	**81***	**185***

*One missing

Fig. 3 Preference for stage of exposure to speciality information by gender



It is not of course surprising that students reported interest in areas they have enjoyed. It has previously been pointed out that faculty perceive themselves to be strong influencers of student speciality choices via their enthusiasm, which may of course influence student enjoyment somewhat.[26] A wider 'career mentor' role at undergraduate level could complement direct exposure by: helping students to explore information and guidance available;[13] or facilitating contact with speciality trainees and consultants as a platform for students to ask questions and to obtain advice from the specialists themselves.[27]

Dental schools could also involve wider stakeholders such as the BDA, Royal Colleges and Specialist Societies to enhance advice given to students. It has been noted that the GDC, together with Government Health Departments, need to adapt to possible changes in the skill mix necessary for a modern dental workforce, focused on both treatment and prevention across the dental team, which has implications for specialists, generalists, and interdisciplinary care alike.[28,29]

As dental provision dynamically responds to changing population needs such as an ageing population with increased needs for complex dental treatment, facilitating more undergraduate student knowledge of this landscape of provision, in what is a highly competitive environment,[30] seems worthy of consideration.[31]

Strengths and limitations

The survey had a high response rate across the school, and missing data were minimal. The population sample of BDS 1-5 allowed for some tracking across the years, albeit between-groups. The main limitation is that this was a cross sectional survey. It would be worthwhile carrying out a longitudinal study with a student cohort through to post-VT employment to determine if/when choices emerge, what factors/exposures influence such, and how these change over time. The psychological impact of unfulfilled speciality ambition could also then be examined. In addition, these results are from a single site. We could also have asked about student knowledge and/or anticipation of developments whereby other dental team members will increasingly deliver routine primary dental care, and whether this factored in their choices. Finally, future work could compare results from different institutions, curricula or international criteria for qualification.

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Conclusion

This survey, one of the few to date to explore UK dental undergraduate perceptions around speciality careers, found that a majority showed interest in speciality training, yet felt under exposed to relevant cases and said they had a lack of knowledge of the speciality career progression. Many specialties were under-represented in choices, with orthodontics in early years, and oral surgery in later years, the most commonly cited by all, and more so by males. Enjoyment was the main influencing factor, following from exposure to cases and procedures. Educator mentoring roles offer the potential to engage students in exploring knowledge of other specialties in a structured way, so that they enter vocational training with a rounded idea of the available options.

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Author contributions

YL conceived the study. YL and AR prepared the survey tool and submitted the ethical approval application. YL undertook the fieldwork. AR led the statistical analysis. YL drafted a paper, and AR contributed to the final draft.

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