

Contemporary dental practice in the UK. Part 1: demography and practising arrangements in 2015

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Key points

Discusses a 121-question questionnaire, based upon two previous questionnaires, on the subject of 'what UK dentists do', which was distributed to 500 UK dentists in 2015.

Presents the principal finding that the mean percentage of patients receiving NHS by the respondents was 50%. Fifty-one percent of respondents were practice principals, 36% being associates.

Highlights that, regarding recently introduced techniques, 80% of respondents reported using nickel-titanium files, 74% used digital radiography, 47% used zirconia bridgework and 25% reported using tricalcium silicate.

Objectives To determine, by means of an anonymous, self-reported questionnaire, the demographic profile and practising details of general dental practitioners in the UK in 2015. **Methods** A previously-piloted and validated 121-question questionnaire was distributed during 2015 to 500 dentists at UK dental meetings with a request that they complete the questionnaire and return it by post in the reply-paid envelope to the corresponding author. **Results** Three hundred and eighty-eight useable questionnaires were returned, giving a response rate of 77.6%. Of the respondents, 60.2% were male and 39.8% female. Their mean age since graduation was 19.7 years. Just over half of the respondents (50.9%) replied that they were practice principals, 35.8% were associates and 10.6% were foundation dentists. A quarter of the respondents were in single-handed practices, the remainder being in a partnership or group practice. There was a mean of 4.2 dentists per practice, while the mean number of dental therapists in each practice was 0.3 and 1.2 hygienists. Regarding the first available NHS appointment in the respondents' practices for non-urgent care, 23.4% could provide this on the same day, the equivalent figure for private care being 40.1%. The mean percentage of patients receiving NHS treatment was 50%, with 33.8% receiving private treatment. Just over half of respondents considered that Care Quality Commission inspections were 'valuable for fostering patient trust and confidence in dental care.' The collected data indicated that 55.4% of respondents had an intra-oral camera, while, with regard to recently-introduced concepts and techniques, 80.4% used nickel-titanium files, 47.4% used zirconia-based bridgework and 24.9% used tricalcium silicate. Of great interest, perhaps, is the response to digital radiography/digital imaging, with the results indicating that 74.1% of respondents used this form of radiography. Regarding checking the light output of the light curing units, 53.1% stated that they did check the output, but in some cases this might be at a six-monthly interval. **Conclusion** Results from this survey indicated that NHS service provision has dropped to approximately 50% amongst the respondents. Regarding the staffing of dental practices, just over half the respondents were practice principals and there was a mean of 4.2 dentists per practice. The results also indicated that UK dentists continue to be innovative in the techniques that they employ.

Introduction

The practice of dentistry in the UK is subject to a variety of factors, some internal, such

as Government changes in regulations, and some external, such as varying exchange rates which may influence the cost of materials and equipment. As a result, dental practice has changed over the past 30 years. Among the other factors potentially influencing changes are the increasing numbers of teeth being retained,¹ increased patient expectations, especially in relation to the dental attractiveness of their anterior and posterior teeth, the increased and increasing input of social media and the increasing number of large commercial organisations as employers of dentists and providers of patient care. In addition, it may be considered that the pace of this change will further increase following the UK electorate's

decision to leave the European Union in the referendum of June 2016.

Against this background, two detailed questionnaire-based surveys of 'what UK dentists do' were carried out in 2003 and 2008.^{2,3} Given the potential for change, it was considered appropriate to follow up the 2008 investigation seven years later using a questionnaire adapted from those used previously.

It was, therefore, the aim of the present work to present the results of a questionnaire distributed to a sample of UK dentists, in respect of their demographic profile and practising arrangements in 2015/2016. Two subsequent papers will present details of the techniques and materials utilised by the respondent

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dentists and a final paper will compare and contrast the differences from the results of the first questionnaire in 2003.³

Methods

A self-reported questionnaire was piloted among ten postgraduate dentists who were enrolled on the Master's in Advanced General Dental Practice at the University of Birmingham, UK. A small number of changes were suggested and these were incorporated into the final draft of the questionnaire, which contained many of the elements of the questionnaires used in 2003 and 2008, but with additions in accordance with the authors' perceived views on the potential changes to contemporary UK dentistry since the previous survey was undertaken. Included among the new questions were those related to inspections by the Care Quality Commission (CQC), these being an innovation instituted by the Government in England and Wales since the time of the first questionnaire in this series, with an equivalent in other areas of the UK. Given that these have caused some debate among dentists, it therefore was considered appropriate to include six questions relating to this change. The questionnaire, therefore, contained 121 questions, many of which contained supplementary sections for additional responses, and was anonymous.

Dentists recruited to the study were those who were attending postgraduate dental meetings at a variety of locations around the UK at which one or more of the authors were present, and who expressed a willingness to complete the lengthy questionnaire. Other than the above, there were no inclusion and exclusion criteria for the study, other than the participating dentists being in dental practice in the UK. The arrangements for the recruitment of the participants aimed to provide a wide geographic distribution of dentists from across the UK.

The data from the questionnaire were collated and entered into a Microsoft Excel spreadsheet before being exported for statistical analyses, which were undertaken in STATA/SE 14.2 and Minitab 17.3. Summary statistics (for example, percentage of responses, means and standard deviations, medians, inter-quartile ranges and ranges) were calculated as appropriate for each question. Percentages are based upon the number of respondents answering each question, given that not all questions were answered by every respondent. As the aim of

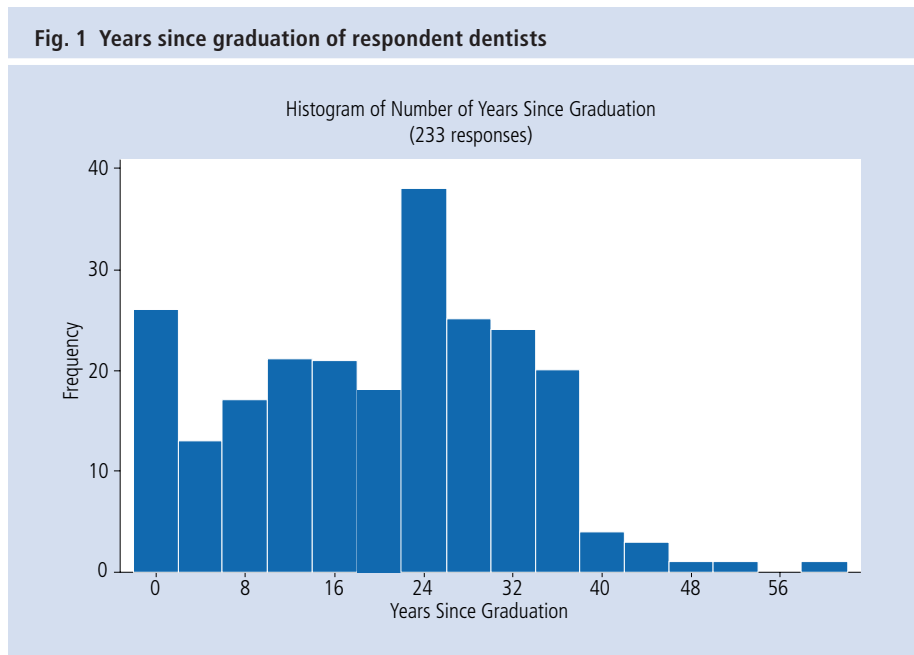


Table 1 Time to first available appointment for non-urgent care

	First available appointment for non-urgent care: Percentage (number) of respondents	
	NHS appointment (274 responses)	Non-NHS appointment (344 responses)
Same day	23.4 (n = 64)	40.1 (n = 138)
Tomorrow	6.9 (n = 19)	9.0 (n = 31)
Within 5 days	33.2 (n = 91)	31.4 (n = 108)
Within 3 weeks	26.3 (n = 72)	15.4 (n = 53)
More than 5 weeks	10.2 (n = 28)	4.1 (n = 14)

this paper was to summarise the demographics and current practising arrangements of UK dentists, there were no formal, pre-specified, hypotheses and thus the presented analyses are of a descriptive nature only.

Results

A total of 388 usable questionnaires were returned, from 500 distributed, giving a response rate of 77.6%.

Demographic data

Of the respondents, 60.2% (n = 233) were male and 39.8% (n = 154) were female, with the mean age since graduation being 19.7 years (standard deviation [SD] 12.0, median 22.0) and the range being zero to 59 years (Fig. 1).

Just over half of the respondents, 50.9% (n = 192), replied that they were practice principals, 35.8% (n = 135) were associates, 10.6% (n = 40) were foundation dentists (FDs) and 2.7% (n = 10) were assistants. A quarter, 25.0%

(n = 95), of respondents were in single-handed practices, while 75.0% (n = 285) were in a partnership or group practice. Regarding practice location, 56.9% (n = 214) were in a city/town centre, 33.2% (n = 125) were practising in the suburbs and 9.8% (n = 37) were practising in a rural area.

There was a mean of 4.2 (SD 2.7, median 4.0, range one to 31) dentists per practice, with a mean of 23.9 (SD 17.6, median 20.0, range zero to 120) dentist-delivered patient treatment sessions being available per week per practice (a session being defined in this work as a half-day session). The mean number of dental hygienists in each practice was 0.3 (SD 0.6, median 0.0, range zero to five), while there was a mean of 1.2 (SD 1.2, median 1.0, range zero to six) therapists. The distributions are presented for all categories of dental healthcare workers in practices in Figure 2.

Across all respondents, the mean number of therapist sessions per week was 2.4 (SD

Fig. 2 Distributions of numbers of dental healthcare workers from the respondent practices

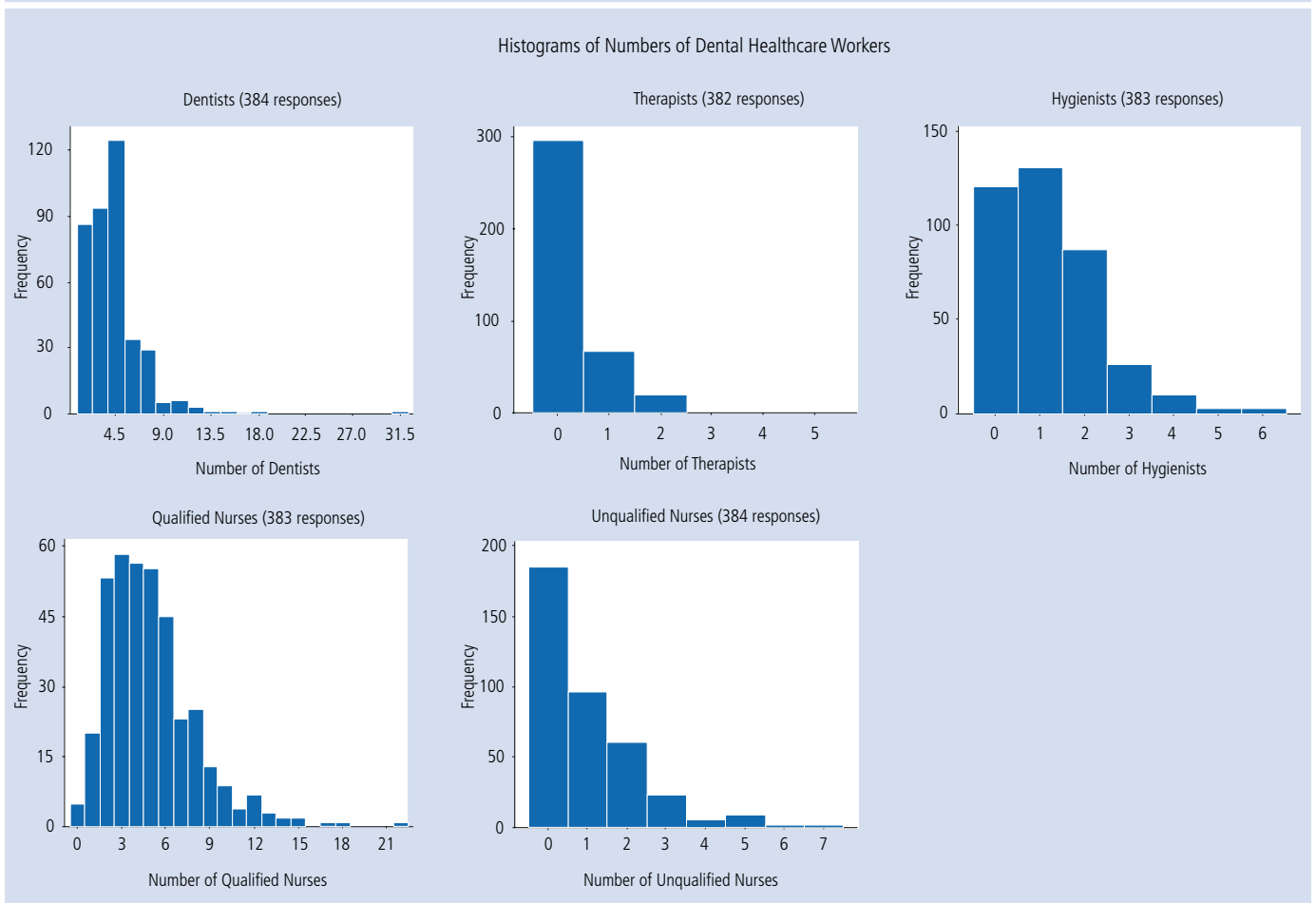
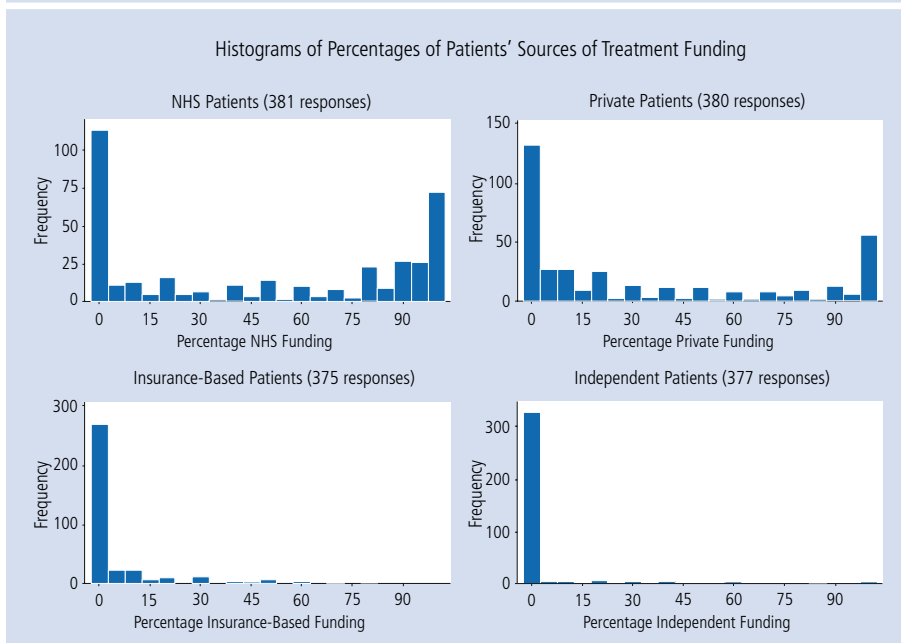


Fig. 3 Distributions of percentages of patients by source of treatment funding



8.2, median 0.0, range zero to 111) and the mean number of hygienist sessions 5.8 (SD 5.8, median 4.0, range zero to 42). After excluding practices that reported having no

therapist or hygienist sessions, the mean number of therapist sessions per week was 6.5 (SD 12.5, median 4.0) and the mean number of hygienist sessions was 6.9 (SD 5.7, median

6.0, range one to 42). The respondents stated that the mean number of patients seen by a therapist during a single session was 3.7 (SD 8.7, median 0.0) and for a hygienist/therapist 7.7 (SD 5.0, median 8.0). After excluding practices that reported having no therapist or hygienist/therapist sessions, the mean number of patients seen by a therapist during a single session was 10.0 (SD 12.0, median 8.0) and for a hygienist/therapist 9.1 patients per session (SD 4.1, median 8.0).

Practice work pattern

With regard to practice ‘busyness’, Table 1 presents the timings for the first available appointment in the respondents’ practices for non-urgent care.

Method of patient payment

The mean percentage of patients receiving NHS treatment was 50% (SD 41.9, median 50.0, range zero to 100), with 33.8% receiving private treatment (SD 33.8, median 15.0, range zero to 100) (Fig. 3).

Thirty-two respondents indicated that they had patients with other funding sources;

from additional comments made on the questionnaires, it is apparent that the majority of 'other' methods of funding related to patients (and their descendants/partners) from the armed forces.

Chairside assistance

Regarding chairside assistance, the mean number of qualified dental nurses per practice was 5.0 (SD 3.1, median 4.0, range zero to 22), with a mean of 1.0 (SD 1.3, median 1.0, range zero to seven) unqualified nurses (Fig. 2).

Postgraduate education

Regarding the respondent dentists' CPD (continuing postgraduate development), the number of courses attended is presented in Table 2.

Attitudes to the Care Quality Commission

The responses to these questions are presented in Table 3.

Pain and anxiety control

Respondent practitioners were found to use a variety of forms of anaesthesia and sedation, with all but 1.3% (n = 5) using local anaesthesia (LA). Intravenous sedation was used by 16.0% (n = 62), nitrous oxide/inhalation sedation by 8.0% (n = 31), hypnosis by 2.6% (n = 10), acupuncture by 2.8% (n = 11) and referral for hospital/community based general anaesthesia by 17.3% (n = 67). Regarding LA, the proportion of respondents who used lignocaine was 82.9% (n = 321), articaine 60.5% (234), mepivacaine 13.7% (n = 53), and 'other' LA 8.3% (n = 25), this principally being comprised of citanest (n = 21).

Use of practice-based computers

Responses indicated that 93.8% (n = 364) of respondents' practices used a computerised patient management system, with R4 (n = 119) and Software of Excellence (n = 150) being the most frequently mentioned brands of software. Regarding transmission of payment claims to the NHS, 86.0% (n = 246) responded that they used this routinely and 11.5% (n = 33) responded 'never'. Regarding the use of emails, 94.0% (n = 359) responded that they used this, with 93.5% (n = 346) of those using it for correspondence, 54.3% (n = 201) for ordering materials, and 38.9% (n = 144) for sending patient appointments.

On the subject of the internet, 77.9% of

Table 2 Number of CPD courses in last 12 months

Number of CPD courses attended in last year	Percentage (number) of respondents (385 responses)
1–2	5.2 (n = 20)
3–4	15.5 (n = 60)
5 or more	78.8 (n = 305)

Table 3 Do you consider that CQC inspections of dental practices are beneficial?

Beneficial for:	Percentage (n) of respondents reporting agreement (384 responses)
Dental team	38.8 (n = 149)
Safety of patients	56.3 (n = 216)
Achieving efficiencies in the provision of dental care	19.8 (n = 76)
Clinical outcomes	16.1 (n = 62)
Patient trust and confidence in dental care	51.3 (n = 197)
No-one	22.8 (n = 87)

Table 4 Types of camera used

Camera type	Percentage (number) of respondents (196 responses)
Digital compact	22.4 (n = 44)
Digital SLR	51.5 (n = 101)
Video	16.3 (n = 32)
Other	9.7 (n = 19)

Table 5 Uptake of new concepts and techniques

New concept/technique	Percentage (number) of respondents (378 responses)
Nickel titanium endo-files	80.4 (n = 304)
Digital xrays/digital imaging	74.1 (n = 280)
Zirconium-based all-ceramic bridgework	47.4 (n = 179)
Tricalcium silicate (eg Biodentine)	24.9 (n = 94)
Mineral trioxide aggregate (MTA)	24.3 (n = 92)
Air abrasion tooth preparation	19.0 (n = 72)
Fibre reinforced resin composite bridgework	18.0 (n = 68)
CAD-CAM restorations	16.9 (n = 64)
Cone beam CT	15.6 (n = 59)
Guided tissue regeneration	14.3 (n = 54)
Diagnostic software	13.5 (n = 51)

respondents (n = 300) stated that their practice had a website, and 56.8% (n = 216) used the internet to communicate with patients, with 32.3% (n = 124) using social media to communicate with patients.

Innovations

The collected data indicated that 55.4% of respondents (n = 214) owned an intra-oral camera, with 51.9% (n = 109) using this routinely and 43.8% (n = 92) using it

Table 6 Use of lasers

Use of lasers	Percentage (number) of respondents (377 responses)
I do not own a laser and would not like to	57.0 (n = 215)
I do not own a laser but would like to	38.2 (n = 144)
I own a laser and use it	4.0 (n = 15)
I own a laser and do not use it	0.8 (n = 3)

Table 7 Type of orthodontics provided

Type of orthodontics	Percentage (number) of respondents (81 responses)
Limited to '6-month smile' orthodontics	25.9 (n = 21)
Limited to minor movements	42.0 (n = 34)
Limited to treatment of mild/moderate malocclusions	32.1 (n = 26)

Table 8 Frequency of checking light curing units

Frequency of checking LCU	Percentage (number) of respondents (204 responses)
Every day	9.8 (n = 20)
Every week	26.5 (n = 54)
Every month	33.3 (n = 68)
Every 6 months	16.2 (n = 33)
Less than every six months	14.2 (n = 29)

Table 9 Frequency of changing gloves during a 30-minute appointment

Glove change	Percentage (number) of respondents (385 responses)
Typically use one pair of gloves only	46.0 (n = 177)
Once	20.5 (n = 79)
Twice	24.7 (n = 95)
More than twice	8.8 (n = 34)

'occasionally'. The types of camera used are detailed in Table 4. With regard to recently-introduced concepts and techniques, the results are presented in Table 5. Regarding the use of lasers, the results are presented in Table 6.

Provision of orthodontics

Regarding the provision of orthodontics by the respondents, 73.9% (n = 281) stated that they never provided this, while 20.8% (n = 79) stated that they provided this 'occasionally' and 5.3% (n = 20) 'routinely'. Of those respondents who stated that they provided orthodontic care, the type of care provided is summarised in Table 7.

Preventive dentistry

Regarding their use of fluoride, 5.2% (n = 20) stated that they did not use topical fluoride. However, 74.4% (n = 288) stated that they used practice-based fluoride gel treatments, and 5.4% (n = 21) used practice-based fluoride liquid rinses. Regarding the use of fluoride gel for patients' home use, 36.4% (n = 141) stated that they prescribed this, while 49.4% (n = 191) prescribed a fluoride rinse for patients' home use.

Regarding their use of fissure sealants, 41.5% of respondents (n = 160) stated that they prescribed these 'routinely', with 52.8% (n = 204) prescribing them 'occasionally' and 5.7% (n = 22) 'never'.

Respondents were asked the question, 'do you have the knowledge and skill to apply behavioural interventions aimed at behavioural change in your patients?' In reply, 64.8% (n = 245) responded 'yes', and, when asked, 'do you have the knowledge and skill to meet the preventive dentistry needs and expectations of the older patient?', 93.7% (n = 359) replied 'yes'.

Equipment

When asked about their preferred chair-side equipment, 55.3% of respondents (n = 209) used a cart, while 35.2% (n = 133) used an 'over the patient' design of equipment, and 9.5% (n = 36) stating 'other', with respondents indicating a variety of methods such as 'bracket table off cabinet', 'fishing rod arm', 'arm attached to wall', and, 'nurse passes it behind patient'. Regarding contamination of compressed air, 92.0% (n = 355) stated that they did not note contamination with oil, while 80.8% (n = 312) did not note contamination with water. Ninety-two per cent (n = 356) of respondents advised that they used disposable three in one syringe tips, and, of those who did not use disposable three in one tips, 74.3% (n = 26) stated that they were confident that their re-useable tips were sterilised between uses. Regarding the dental unit water, 88.9% of respondents (n = 335) stated that they used a dental unit water sterilisation system.

Regarding the respondents' light curing unit (LCU), 86.6% (n = 324) stated that this was an LED type, with 12.6% (n = 47) being halogen. Regarding the frequency by which the output of the respondents' LCU was checked, 53.1% (n = 203) stated that they did check the output. The frequency whereby this was checked is shown in Table 8.

How did respondents deal with their LCUs between patients? Changing a disposable sleeve was the method adopted by 48.7% (n = 147) of respondents, whereas 37.4% (n = 113) used a disinfectant wipe and 5.6% a disinfecting solution; for 7.9% (n = 24) of respondents, their light guide was autoclavable.

Infection control

Regarding the type of gloves worn by respondents, powder-free latex free were the most frequently worn (72.9%; n = 272), with 23.9% (n = 89) wearing powder-free latex, and small proportions wearing powdered latex-free (2.1%) and powdered latex (1.1%). Regarding dermatological problems considered to be associated with glove wearing, 17.1% (n = 66) reported suffering from these, and, of these,

69.4% (n = 50) reported dry cracked skin, 26.4% (n = 19) reported suffering from 'any form of dermatitis' and 12.5% (n = 9) reporting 'allergy'. When asked, 'how many times do you change your gloves during the course of a 30-minute appointment?', the responses were as presented in Table 9.

Health of dentists

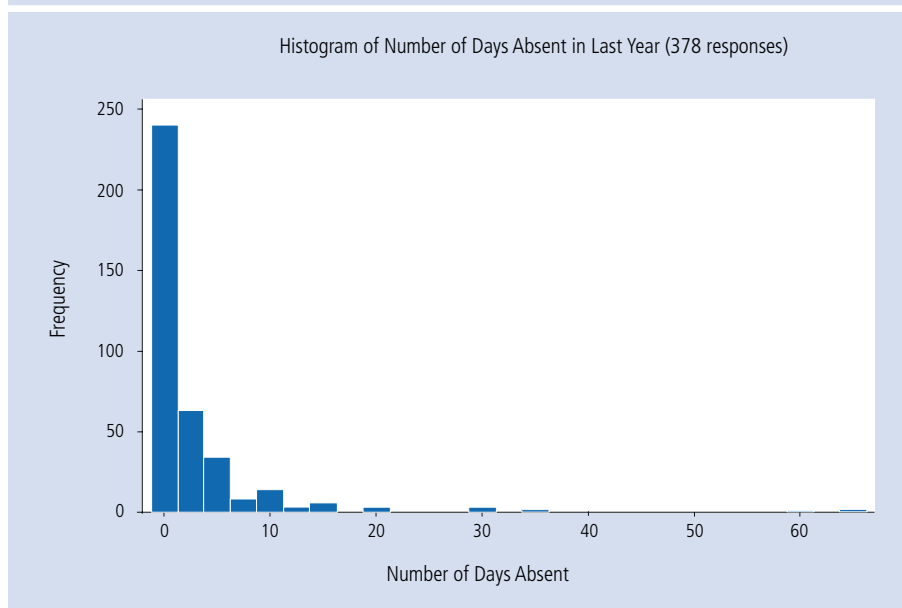
The questionnaire asked, 'how many days have you been absent from work in the past year because of ill health?'; with the mean reported number of days absent being 2.7 (SD 6.5, median 1.0, range zero to 65) (Fig. 4). Colds/influenza was the most commonly stated ailment, affecting 33.2% of respondents (n = 128), with gastro-intestinal upset (14.8%; n = 57) being the next most common ailment, followed by neck and back problems (7.8%; n = 30), headache (7.0%; n = 27), stress (4.9%; n = 19), respiratory tract infections (3.1%; n = 12), burnout (2.3%; n = 9) and, depression or other mental illness (2.1%; n = 8), while 2.6% (n = 10) of respondents reported having had surgery and 1.3% (n = 5) reported that they had suffered cancer.

Discussion

The response rate to the questionnaire was considered good and compares favourably with previously-reported response rates to mailed questionnaires.⁴ The sample of respondents could be considered to be a convenience sample, given that they were attending a post-graduate course in a wide variety of locations around the UK when asked to participate. As such, the authors consider that the survey may be considered representative of UK dentists as a whole. However, given that the location of the respondents was not requested, we were unable to identify differences in the materials/techniques used in different parts of the UK.

The survey produced respondents with a wide range in terms of years since graduation, although it may be worth noting that years graduated was not provided by 155 of 388 respondents, ie almost 40%. The percentage of foundation dentists, at 10.6% in the sample, may be considered higher than the profession at large, but this may be a result of the method of distribution of the questionnaires (at some larger dental meetings); on the other hand, the fact that over half of the respondents were practice principals may be considered to have balanced that. In short, the survey may be considered to provide a snapshot of 'what UK

Fig. 4 Reported days absent from work in the year prior to the survey



dentists do' in terms of practice organisation, techniques and materials used.

While the differences in what dentists do between 2015 and the date of the first survey will be the subject of a further paper in this series, there are a number of aspects which are considered worthy of mention here.

The results of this study indicate the high potential capacity for work of dentists in the UK, given the high number of patient treatment sessions available per week, namely, a mean of 23.9 dentist-delivered patient treatment sessions being available per week. On the other hand, when prevention may be considered to be high on the agenda for many years in the UK, aimed at encouraging a more preventive-oriented attitude in the dental workforce, it is perhaps surprising that the mean number of dental therapists in each practice was only 0.3, and 1.2 hygienists (when the mean number of dentists per practice was 4.2), with the respondents reporting the mean number of therapist sessions per week to be 2.4 and the number of hygienist sessions to be 5.8. However, the typical number of patients seen by a therapist per session was 3.7, which compares unfavourably with the number seen by dentists, 14 (reported in the previous survey³), and hygienist/therapists, at 7.7. The efficiency of these members of the dental workforce may, therefore, be considered worthy of further investigation.

This work presents a further drop in the provision of dental treatment under the NHS arrangements, given that respondents in the previous survey stated that 57% of their patients

were treated under the NHS and the figure in the present work was 50%. The reasons for this may only be surmised, but could be dissatisfaction with the payment arrangements and fees, or patients electing for treatments that are not available within the NHS arrangements, even though private treatment is likely to be more expensive.

The results of the present survey indicate that the UK dental profession is aware of the need for continuing postgraduate education, given that 78.8% of respondents stated that they attended five or more courses per year, which could be considered to be significantly more than the 15 hours of verifiable CPD required by the UK's General Dental Council for dentists to remain on the dentists register.

The respondents adopted a wide variety of relatively new techniques/innovations, for example, 80.4% using nickel-titanium files 47.4% using zirconia-based bridgework, 24.9% using tricalcium silicate and 24.3% MTA. Of great interest, perhaps, is the response to digital radiography/digital imaging, with the results indicating that 74.1% (n = 280) of respondents are now using this. In addition, just over half the respondents (51.7%) used an intra-oral camera routinely and a further 43.6% used one 'occasionally'. The proportion of dentists now using digital radiography/imaging is now high, with approximately three-quarters of respondents reporting that they used this, a large increase from the last reported data in 2008 when 28% used digital. With regard to recently-introduced concepts and techniques, other notable newer techniques include the use of

nickel-titanium files rising by *circa* 20% since the last survey, zirconia-based bridgework also by 20%, while tricalcium silicate and MTA are now used by approximately one quarter of respondents, indicating perhaps an increasing awareness of UK dentists in the therapeutic properties of such materials.⁵ However, the impact of cone-beam CT and fibre-reinforced resin composite bridgework has remained relatively static.

Results relating to the provision of orthodontics indicate that one fifth never provide this. However, of those who do provide some orthodontics, it is of interest to note that the recently-introduced six-month smile orthodontics has had a relatively small uptake, by a quarter of those who carry out orthodontics (21 respondents).

While it may not be considered a surprise to note that all but 6% of practices rely on computers for their patient management, it may be of interest to note the increasing role that the internet now plays in the life of dental practices. Three quarters of practices now have a practice website, while over one half of practitioners now use the internet to communicate with patients, and one third use social media to communicate with patients.

Respondents were asked the frequency by which they checked the effectiveness of their LCUs. Given that the LCU is now central to a contemporary dental practitioner's armamentarium, it may be considered surprising to note that almost half of the respondents did not check the output of their light unit. Given that a poorly performing LCU will not cure resin composite restorations optimally,⁶ it can therefore be surmised that poorly cured composite restorations will perform suboptimally. However, this is unlikely to be proven in a scientific clinical evaluation, given that it is

unlikely that any ethics committee, anywhere, would approve a study examining poorly cured composite restorations!

Lastly, the attitudes of the respondents to the CQC series of questions appear to indicate that more than half of the respondents believe that the CQC is of benefit to the safety of patients and that it fosters patient trust and confidence in dental care. On the other hand, the results indicate that there is little agreement that the CQC is of value to clinical outcomes or beneficial to the dental team.

Key findings

Assuming the findings of the present study are considered representative of general dental practice at the time of the survey, the data obtained indicate the following:

- Regarding how patients paid for their dental care, 50% received NHS treatment and 33.8% private treatment
- Of the respondents, 60.2% were male and 39.8% female. Their mean age since graduation was 19.7 years. Just over half of the respondents replied that they were practice principals, and 35.8% were associates. There was a mean of 4.2 dentists per practice, while the mean number of dental therapists in each practice was 0.3, with 1.2 hygienists
- Regarding practice 'busyness', 23.4% could provide an NHS appointment for non-urgent care on the same day, the equivalent figure for private care being 40.1%
- Just over half of respondents considered that CQC inspections were 'valuable for fostering patient trust and confidence in dental care'
- With regard to recently-introduced concepts and techniques, 80.4% used nickel-titanium

files, 47.4% used zirconia-based bridgework, 24.9% used tricalcium silicate, 16.9% used CAD-CAM restorations and 18.0% used fibre-reinforced resin composite bridgework. Regarding digital radiography/digital imaging, 74.1% of respondents used this form of radiography

- Regarding checking the light output of the LCUs, 53.1% stated that they did check the output, but in some cases this might be at a six-monthly interval.

Conclusions

Three hundred and eighty-eight usable questionnaires were returned, a response rate of 77.6%. The respondent dentists continue to use new materials and techniques, but only half are providing their treatment under the NHS arrangements.

Acknowledgments

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