

# Maintaining peri-implant health: an evaluation of understanding among dental hygienists and therapists in Wales

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## Key points

Provides an overview of the approach by dental hygienists and therapists in Wales regarding dental implant maintenance.

Identifies the barriers to implant training.

Reports on opinions relating to the current level of implant education.

## Abstract

**Objectives** To describe the approach taken by dental hygienists and therapists (DH/Ts) in Wales regarding dental implant maintenance. To gather their opinions about the current level of implant education.

**Materials and methods** Online questionnaires were distributed to 257 DH/Ts within Wales.

**Results** The response rate was 35%. Dental implant care was within the remit of service for 92% of respondents. All respondents that provided implant care stated that they performed oral hygiene instruction, while 98% performed supragingival debridement, 85% subgingival debridement, and 64% clinical assessment of peri-implant health. A high proportion of DH/Ts in Wales did not feel entirely confident in carrying out procedures relating to peri-implant maintenance and only 27% felt confident in clinically assessing dental implants. The majority (83%) felt that postgraduate training in peri-implant maintenance should be obligatory. 'No available courses' was the main reason for not attending further postgraduate training in implantology.

**Conclusions** A high proportion of responding DH/Ts practising in Wales do not feel entirely confident in carrying out procedures relating to peri-implant maintenance. Postgraduate training may be useful in addressing this issue and undergraduate training programmes may need to consider increasing trainees' exposure to dental implant maintenance.

## Introduction

The GDC expects dental therapists and hygienists (DH/Ts) in the UK to be competent at maintaining peri-implant health and describing the risks related to dental implant therapy.<sup>1</sup> Limited data are presently available on the DH/T workforce in the UK and worldwide relating to the provision of implant care and the current level of implant education. The collection of such information is useful to assist

educational providers, both undergraduate and postgraduate, as well as policymakers as to the improvements and developments required for this sector of the dental team.

Since 2008, the number of DH/Ts in the UK has steadily increased and this is expected to continue to accommodate plans to increase the utilisation of skill mix in dentistry.<sup>2</sup> It is likely that, in the future, DH/Ts will have greater responsibilities towards the care of patients as they will be exposed to larger volumes of patients.<sup>3</sup> In addition, more DH/Ts, if not all, may take up the opportunities to carry out their full scope of practice without needing a prescription from a dentist; 'direct access', which was implemented by the GDC on the 1 May 2013.<sup>4</sup> Such prescribing powers are currently optional and have been slow to take effect due mainly to legislative restrictions and NHS regulations.<sup>5</sup>

Relevant to implant dentistry, it is concerning that litigation in the UK has increased, notably involving peri-implantitis cases.<sup>5</sup> Given the changes in the dental team

structure, DH/Ts are likely to take on a larger role in the maintenance of implant patients and may, therefore, be at greater risk to issues such as claims and complaints. There is, therefore, the ever increasing need to ensure that the current DH/T workforce have the necessary skills and knowledge to provide safe implant care to patients as well as to establish whether developments and improvements in support and education is required.

This study aimed to determine the approach by dental hygienists and therapists (DH/Ts) in Wales regarding dental implant maintenance, and to consider their opinions regarding current opportunities for implant education.

## Methods

An online questionnaire consisting of 16 questions was developed to assess the level of understanding regarding maintenance of peri-implant health among dental hygienists and therapists within Wales. The online

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questionnaire was constructed using software developed by Bristol University (Bristol Online Surveys, Bristol, UK). Both 'open' and 'closed' style questions were included. The questionnaire was developed and pre-piloted within Cardiff Dental School. This was subsequently amended, reviewed and approved by the Cardiff Dental School research ethics committee (Reference No: 1703a).

In March 2017, an email was sent to all DH/Ts in Wales, UK ( $n = 257$ ), using an email database held by the Welsh dental postgraduate department. Participants were provided with the link for the questionnaire, together with a participant information sheet. Topics included:

1. Implant experience and practice setting
2. Implant education and opinion of previous implant training received
3. Demographics.

Reminder emails were sent at two and four weeks from the initial email. After a six-month reply period, due to a low response rate, paper questionnaires were also distributed at a study day for hygienists and therapists within Wales. All the data were collated and examined. The Bristol Online Surveys software programme permitted collection and analysis of the data. Descriptive statistics are reported.

## Results

### Current practice

Completed questionnaires were received from 92 out of 257 (35%) dental hygienists and therapists in Wales. Eighty-five (92%) of the total respondents indicated that providing dental implant care was within the remit of their service. In order to identify the practice setting, respondents were asked the nature of their practice. Some respondents worked in multiple settings and therefore provided more than one answer. The results are shown in Table 1 and the year of qualification of respondents is shown in Table 2.

Forty-six (54%) respondents indicated that the dental setting(s) in which they provided dental implant care offered placement and/or restoration of dental implants to patients. When asked what type of dental care they provided for their implant patients, respondents provided the following responses, shown in Table 3. The two respondents that provided abrasive therapy detailed that they used the air abrasive powder erythritol.

The number of implant patients seen by respondents per month is shown in Table 4.

**Table 1 Nature of practice (n = 85)**

Type of practice	Number of respondents	Percentage
Mixed NHS and private	50	53%
Purely private	28	30%
Hospital dental service	8	9%
Community dental service	6	6%
Purely NHS	2	2%

**Table 2 Year of qualification (n = 92)**

Year	Number of respondents	Percentage
1970–1980	10	10.9%
1981–1990	20	21.7%
1991–2000	24	26.1%
2001–2010	18	19.6%
2011+	20	21.7%

**Table 3 Type of dental implant care provided (n = 85)**

Procedure	Number of respondents	Percentage
Oral hygiene instruction	85	100%
Supragingival debridement	83	98%
Subgingival debridement	72	85%
Clinical assessment of peri-implant health	54	64%
Application of topical antimicrobials and/or antiseptics	32	38%
Photodynamic therapy	4	5%
Air abrasive therapy	2	2%

**Table 4 Number of implant patients seen per month (n = 84)**

Number of implant patients	Number of respondents	Percentage
1–10	63	75.0%
11–20	12	14.3%
21–30	2	2.4%
>30	7	8.3%

Respondents were asked how confident they were at providing various procedures relating to peri-implant health maintenance; the replies are shown in Table 5. Seventy-two (85%) respondents indicated that they scheduled three-monthly implant maintenance intervals for the majority of their patients, six (7%) respondents scheduled six-monthly intervals and the remaining seven (8%) respondents could not provide a definitive answer, stating that their decision varied depending on the patient's needs.

### Implant training

Forty-four out of 92 (48%) respondents received dental implant training during their hygiene and therapy training. Twenty-five (57%) indicated that they received theoretical training only, two (4%) received practical training only and seventeen (39%) received both practical and theoretical training. Seven respondents (16%) felt that they received adequate implant teaching during their training, while thirty-seven (84%) felt that this was inadequate. Of the respondents that felt their teaching was

**Table 5 Confidence levels in provision of procedures relating to peri-implant health (n = 85)**

Procedure	Confident	Somewhat confident	Not confident
Clinically assessing dental implants	27%	62%	11%
Instructing patients in methods of plaque control for implants	78%	22%	0%
Providing supragingival debridement of dental implant supported structures	59%	38%	3%
Providing subgingival debridement of dental implant supported structures	37%	45%	18%

**Table 6 Subject areas that respondents felt were lacking during their hygiene and therapy training (n = 37)**

Subject area	Number of respondents	Percentage
Subgingival debridement of dental implant supported structures	22	59%
Clinical assessment of dental implants	19	51%
Supragingival debridement of dental implant supported structures	17	46%
Theoretical aspects of restoration of dental implants	12	32%
Instruction on methods of plaque control for implants	10	27%

**Table 7 Barriers to implant training (n = 44)**

Barriers	Number of respondents	Percentage
Not deemed necessary when I qualified / I qualified before implant treatment was popular	42	95%
Insufficient patients	31	70%
Insufficient time in curriculum	9	20%
School did not feel this was relevant to the programme	4	9%
Availability of teaching staff sufficiently trained to provide implant teaching	1	2%

**Table 8 Reasons for not attending further courses in implantology since graduating (n = 20)**

Reasons	Number of respondents	Percentage
No available courses	10	50%
Not involved in managing patients with implants	7	35%
Time	5	25%
Cost	4	20%
Location of courses	1	5%
Training obtained with the dentist at work	1	5%

inadequate, twenty-five (67%) indicated that both theoretical and practical aspects were lacking. The remaining twelve (33%) found that the practical aspect only was lacking. Details of which implant subject areas were lacking during their hygiene and therapy training are shown in Table 6. Respondents that felt their training was inadequate or those that did not receive implant

training were asked their opinion of reasons for this; the responses are shown in Table 7.

### Further training

Since graduating, 72 out of 92 (78%) respondents stated that they have attended further continuing education courses in implantology. The twenty respondents (22%)

that did not attend provided the following reasons, as shown in Table 8. One respondent indicated that the location of courses was based mostly in south Wales and this was a barrier for attending. Seventy-six (83%) respondents felt that postgraduate training in the maintenance of dental implants should be obligatory, while 16 (17%) did not feel this was necessary.

## Discussion

Wales has a unique position in the UK as it is served by a single dental teaching hospital. The Welsh Postgraduate Department of Medical and Dental Education centrally holds details of all DH/Ts in Wales. This allowed the authors an opportunity to investigate the knowledge and practising methods of implant care among the nation's dental workforce. An electronic survey provided a simple means of data collection. In this study, the final response rate of 35% was low, despite distribution of follow-up questionnaires at a study day for DH/Ts in Wales. It is evident that online surveys generally receive a 30–40% response rate.<sup>6,7,8</sup> Possible drivers for not participating may be a lack of exposure to the dental implant environment or due to questionnaire fatigue. Methods to improve the response rate could have included the use of individual interviews, focus groups, postal or telephone questionnaires; however, this was beyond the remit of the study. Interpretation of this data should, therefore, take into account the limited responses and consider the risk of participant bias. Nevertheless, data from ninety-two DH/Ts provide useful information on the implant practice patterns and knowledge among this group of dental care professionals.

The majority of DH/Ts that provided implant care worked in mixed NHS and private (53%) or purely private (30%) dental settings, with some respondents indicating that they worked in multiple settings. These findings are similar to a survey of dental hygienists by Gibbons *et al.* even though this group did not specifically provide implant care.<sup>9</sup>

The majority of respondents (92%) stated that dental implant care was within the remit of their service, of which 75% treated one to ten implant patients per month. Interestingly, just half of respondents that provided implant care worked in dental settings which offered dental implant placement and/or restoration, a figure lower than expected. This is an indication that the provision of implant care is common among DH/Ts across all types of practice settings, even if the practice does not provide implant placement

or restoration. In addition, findings revealed that a small number of DH/Ts (29%) were working in private practices that did not offer implant placement or restoration, but nevertheless were still providing implant care. The majority of respondents indicated that they scheduled three-monthly implant maintenance intervals for the majority of their patients. At present, there are no fixed guidelines on recall intervals; however, the international working group suggests that this is likely to be between three to six months, depending on the patient's risk profile.<sup>10</sup>

Preventive care, monitoring and diagnosing peri-implant conditions and delivering professional mechanical plaque removal can be considered the key clinical components that are required to maintain peri-implant health.<sup>11</sup> DH/Ts are expected to be competent at performing such procedures to meet GDC requirements. All respondents stated that they performed oral hygiene instruction, almost all performed supragingival debridement, 85% subgingival debridement and 64% clinical assessment of peri-implant health. It is encouraging to see that all DH/Ts provided oral hygiene instruction, there is the concern, however, that a reduced number of respondents provided non-surgical interventions or clinical assessment of peri-implant health. These findings suggest that DH/Ts may be falling short of the implant treatment that they are expected to provide and that may be required. When respondents were asked how confident they were at clinically assessing dental implants and instructing patients in methods of plaque control for implants, it was alarming to find that only 27% and 78%, respectively, felt confident. Furthermore, only 59% and 37% of respondents felt confident in providing supragingival and subgingival debridement of dental implant supported structures, respectively. These findings highlight a potential deficiency in implant education and training among DH/Ts in Wales; thus further investigation is required so as to ensure that patients are receiving the appropriate implant care.

Studies have shown that a lower level of implant training at undergraduate level can negatively influence the practising patterns of newly qualified dentists.<sup>12,13</sup> This concept can similarly be applied to DH/Ts, whereby lack of implant teaching during dental hygiene and therapy training may explain the current deficiencies in implant education, training and implant care provision by DH/Ts in Wales. Only 48% of respondents stated that they received dental implant teaching during their hygiene and therapy training, of which 64% felt that

their training was inadequate. A little more than half of respondents stated they received theoretical training only. The most commonly cited deficient subject areas were non-surgical debridement of implants and clinical assessment of dental implants. The main reasons for the lack of implant training included 'not deemed necessary when qualifying', 'qualified before implant treatment was popular' and 'insufficient patients'. A survey by Ward *et al.* in 2012 similarly found that over half of responding dental hygienists in the USA did not receive formal training on dental implant maintenance and it was suggested that implants may not have been part of their curriculum at that time.<sup>14</sup> A summary of the above findings may explain the potential reasons for the low level of confidence among respondents in performing the range of procedures expected for implant maintenance, an issue that requires further investigation.

Supervised and focused continuing education improves clinical skills and knowledge, and helps delay declining clinical competence. The majority of DH/Ts (78%) stated that they had attended further education courses in implantology, which is reassuring to note. The main reasons given by respondents that did not attend courses included 'no available courses' (50%) and 'not involved in managing patients with implants' (35%). There is the concern that DH/Ts may have limited access to postgraduate implant education. Educational providers, particularly the postgraduate deaneries, could review the availability and demand of implant DH/T courses and increase the numbers. The majority of DH/Ts felt that further continuing education courses in implantology should be obligatory, a strong statement. Given the direction that the dental workforce is heading and the increasing popularity of implants, DH/Ts will be first in line for providing peri-implant maintenance. It is, therefore, essential that the necessary support is given to ensure that DH/Ts are sufficiently trained to deliver safe implant care. Based on the opinions of respondents in this survey, the results suggest that there may be a need to: 1) review, improve and develop implant teaching in DH/T training; and 2) review and implement further postgraduate education and teaching support, such as courses in implant maintenance for the DH/T workforce in Wales.

## Conclusions

The main limitation of this study is the low response rate, however the data collected still provide useful information on the implant

practice trends and knowledge among this responding group of dental professionals. A high proportion of responding DH/Ts practising in Wales do not feel entirely confident in carrying out procedures relating to peri-implant maintenance. Postgraduate training may be useful in addressing this issue through the provision of high-quality hands-on courses. The findings suggest that training programmes may need to consider increasing trainees' exposure to dental implant maintenance, however, further investigation is required.

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## References

1. General Dental Council. Preparing for Practice: Dental team learning outcomes for registration. 2015. Available at <https://www.gdc-uk.org/professionals/students-and-trainees/learning-outcomes> (accessed May 2019).
2. Centre for Workforce Intelligence. Securing the Future Workforce Supply: Dental care professionals stocktake. 2014. Available at [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/507376/CFWI\\_Dental\\_care\\_professionals\\_stocktake.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/507376/CFWI_Dental_care_professionals_stocktake.pdf) (accessed May 2019).
3. General Dental Council. General Dental Council Corporate Strategy 2016–2019. 2015. Available at [https://www.gdc-uk.org/api/files/2015-11-04\\_4.1%20GDC%20Corporate%20Strategy%20App%201%20Clean.pdf](https://www.gdc-uk.org/api/files/2015-11-04_4.1%20GDC%20Corporate%20Strategy%20App%201%20Clean.pdf) (accessed May 2019).
4. General Dental Council. Direct Access. 2013. Available at <https://www.gdc-uk.org/professionals/standards/direct-access> (accessed May 2019).
5. Dental Protection. Riskwise: Dental implant feature. 2015. Available at <https://www.dentalprotection.org/docs/librariesprovider4/default-document-library/riskwise-uk.pdf?sfvrsn=0> (accessed May 2019).
6. Beddis H P, Durey K A, Chan M F W Y. Survey of consultants in restorative dentistry in the UK regarding ongoing care of patients provided with dental implants. *Br Dent J* 2017; **223**: 255–260.
7. Cook C, Heath F, Thompson R L A. A meta-analysis of response rates in webor internet-based surveys. *Educ Psychol Meas* 2000; **60**: 821–836.
8. Cowpe J, Barnes E, Bullock A. Skill-mix in dental teams in Wales. *Vital* 2013; **10**: 38–43.
9. Gibbons D E, Corrigan M, Newton J T. A national survey of dental hygienists: working patterns and job satisfaction. *Br Dent J* 2001; **190**: 207–210.
10. Heitz-Mayfield L J, Needleman I, Salvi G E, Pjetursson B E. Consensus statements and clinical recommendations for prevention and management of biologic and technical implant complications. *Int J Oral Maxillofac Implants* 2014; **29** (Spec Iss): 346–350.
11. Ramanaukaite A, Tervonen T. The Efficacy of Supportive Peri-Implant Therapies in Preventing Peri-Implantitis and Implant Loss: a Systematic Review of the Literature. *J Oral Maxillofac Res* 2016; **7**: e12.
12. Huebner G R. Evaluation of a predoctoral implant curriculum: does such a programme influence graduates' practice patterns? *Int J Oral Maxillofac Implants* 2002; **17**: 543–549.
13. Maalhigh-Fard A, Nimmo A, Lepczyk J W, Pink F E. Implant dentistry in predoctoral education: the elective approach. *J Prosthodont* 2002; **11**: 202–207.
14. Ward S T, Czuszek C A, Thompson A L, Downey M C, Collins M A. Assessment and maintenance of dental implants: clinical and knowledge-seeking practices of dental hygienists. *J Dent Hyg* 2012; **86**: 104–110.