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Teaching Undergraduate Special Care Dentistry in the UK and Ireland: What? How? When? How Much? Who?

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ABSTRACT

Introduction: New dental graduates are expected to have acquired the skills and behaviours to provide dental care for the population they serve. An ageing population and advances in medicine mean that there are increasing numbers of patients who may require Special Care Dentistry. Special Care Dentistry is the branch of dentistry concerned with access to equitable oral healthcare for people with disabilities and those who are disadvantaged. This study aimed to explore the teaching of Special Care Dentistry (SCD) within undergraduate (UG) dental curricula in the UK and Ireland.

Materials and Methods: A cross-sectional online survey was distributed to all SCD teaching leads within 18 universities delivering undergraduate dental curricula in the UK and Ireland. Respondents described their curriculum, teaching and assessment, as well as the barriers and facilitators they faced. Qualitative responses were collected as open-ended text within the survey and coded independently by two authors.

Results: From 12 respondents (67% response rate), the average time given to SCD during training over the whole UG programme was reportedly 47.4 h. While 83% ($n = 10$) reported that students observed treatment delivery for special care patients, only 50% ($n = 6$) reported actual student-delivered care. Almost all ($n = 10$) applied the International Association of Disability and Oral Health curriculum, as recognised by the Association of Dental Education Europe (ADEE). Attitudes towards SCD from academic staff outside of the specialty were seen as the biggest barrier to SCD teaching, whereas the availability of academic staff and emphasis on SCD within the curriculum were facilitators.

Discussion: The teaching of SCD in dental schools in the UK and Ireland is markedly varied, with respondents highlighting barriers to the delivery of teaching and learning in this area.

Conclusions: There is a persistent need to standardise undergraduate exposure to patients requiring Special Care Dentistry across Ireland and the UK. This will equip the future dental profession to adequately and equitably care for the whole of society, regardless of ability.

1 | Introduction

Across Europe, a significant proportion of the population live with disability. In England, Wales and Ireland, for example, about one in five live with a disability; among Scottish adults, this rises to about one in three [1–4]. Demographic shifts also mean that the population is ageing. In the United Kingdom and Ireland, an increasingly older population report higher rates of disability [3, 4].

People with disabilities experience worse oral health outcomes and encounter more barriers to accessing dental services than the rest of the population [5]. According to Gallagher and Fiske [6], primary care dental services should be capable of providing care to the majority of people with disabilities as part of integrated services that mirror the population's spectrum of need. This assertion is complemented by educational standards from the Association for Dental Education in Europe (ADEE) and the General Dental Council UK, which expect that dental graduates possess the skills and behaviours necessary to provide dental care for the population they serve [7–9]. This means that all dental graduates must be equipped with the skills and knowledge to appropriately care for an ageing and increasingly disabled population. Across the UK and Ireland, however, undergraduate dental students feel unprepared to meet the needs of people with disabilities and recognise their own need for greater exposure to the disabled community [10, 11].

High-quality teaching is crucial in reducing barriers to oral health for people with disabilities [12]. The provision of undergraduate teaching in Special Care Dentistry (SCD) has been shown to improve students' confidence, communication and interactions in the provision of dental care for patients with disabilities [13]. Recognising the need for guidance and standardisation in curriculum design, the International Association of Disability and Oral Health (iADH) produced agreed domains and learning outcomes as a standard for undergraduate curriculum design and delivery [14]. This curriculum allows for benchmarking to internationally agreed educational norms across countries and institutions. However, while it has previously been mapped to General Dental Council Standards [15] and been incorporated into European standards [9], the uptake of this curriculum into undergraduate programmes is not known [9].

While the delivery of curriculum has been explored recently in North America, Australia and Malaysia [16, 17], little has been published in Ireland and the UK recently. The most recent survey, completed almost 20 years ago, revealed limited clinical exposure and massive variation in curriculum hours devoted to SCD [18]. This led the authors to conclude that 'a detailed revision of current SCD teaching should be made in each dental school, with emphasis on including much greater opportunity for clinical experience for undergraduates'.

This study aims to explore current undergraduate SCD teaching in Ireland and the UK, and to explore variation, barriers and facilitators in educational practice in Ireland and the UK. The research questions were: Which SCD learning outcomes are delivered across undergraduate dental curricula in Ireland and the UK: by whom, when and how are they delivered and assessed? and, What are the perspectives of educators regarding barriers and facilitators to SCD education in Ireland and the UK?

2 | Materials and Methods

2.1 | Design

A cross-sectional survey of all UK and Irish undergraduate dental professional programmes. King's College London Research Ethics Committee provided ethical approval (Project ID: 41152).

2.2 | Recruitment and Sampling

Individuals who lead SCD undergraduate teaching in all 18 known Universities with undergraduate dental curricula in the UK and Ireland were eligible. Purposive sampling was applied, adopting a combination of three steps. Firstly, authors invited other members of the BSSCD Undergraduate Teaching and Learning Subgroup. Secondly, snowballing was applied; invitees were invited to circulate recruitment packs to colleagues who met inclusion criteria. Thirdly, the Dental Schools Council agreed to circulate recruitment packs to broaden recruitment. Participants received an email with a participant information leaflet and a link to consent form and online survey.

2.3 | Data Collection

A self-report anonymous survey was piloted on Qualtrics (Provo, UT, 2020). An anonymous link was sent to all participants, who had up to four weeks to respond. Partially completed surveys were excluded. On completion, participants automatically received a copy of their responses.

2.4 | Data Collection Tool

The tool (Data S1) consisted of three sections. The first section recorded programme details including student numbers and staffing. The second section focused on SCD curriculum at their institution: its delivery, role of educators and assessment as mapped to the iADH undergraduate curriculum. The third section, using mainly open-ended questions, explored respondents' perspectives on the adequacy of their curriculum, barriers and facilitators and recommendations for future teaching in Special Care Dentistry. Qualitative responses were collected as open-ended text within the survey.

2.5 | Analysis

SPSS (v.29: IBM Corp SPSS. Armonk, NY) was used for data analysis. Descriptive statistics were reported to summarise educational practice. Counts and proportions were reported. The student to SCD staff whole-time equivalent (WTE) ratio

was estimated as: students per year × number of years divided by staff WTE. Learning outcomes were mapped and presented according to BSSCD/iADH curriculum standards. Qualitative responses were generally coded for each question separately to address the original questions, though some data were re-grouped, where appropriate. Basic analysis involved responses being openly coded, independently, by two authors (N.B., C.M.G.P.) and initially categorised by one author (N.B.) before being refined and agreed by both, adopting principles of thematic content analysis [19].

3 | Results

3.1 | Characteristics of Undergraduate Special Care Dentistry Programmes

Responses were received by 12 of the 18 known undergraduate teaching Universities with dental curricula in the UK and Ireland, giving a response rate of 67%. Respondents were from the Republic of Ireland ($n = 2$), Scotland ($n = 2$), Wales ($n = 1$) and England ($n = 7$). Ten programmes involved direct entry into dentistry as a primary degree (83.3%), and two adopted Graduate entry, whereby students must already possess a primary degree to study dentistry (16.7%). Nine programmes were five years long (75%), and two were four years long (16.7%).

The typical number of students per year varied from 20 to 150, with a median of 70 students per year. The number of whole-time equivalent (WTE) staff reportedly teaching undergraduate SCD ranged from 0 to 2.5, with a mean of 1.0 WTE (SD = 0.8). The student to SCD staff WTE ratio was estimated to range from 66:1 to 875:1, where staff were available.

When asked how many hours each student spends learning about SCD from course entry to graduation, mean time was 47.4 h (SD = 28.0 h), with a range from 8 to 100 h. The number of patient-facing hours represented a fraction of this time: The number of hours observing treatment ranged from 0 to 32 h (median $n = 6.5$ h); hours treating ranged from 0 to 64 h (median = 7 h). Within this exposure, 83.3% of respondents ($n = 10$) reported that students observed treatment in SCD, whereas only 50% ($n = 6$) reported that their students actually delivered clinical treatment. Educational settings included Community Dental Services, Outreach and Dental Hospitals. Clinical placements at some dental schools were undertaken electively as specific interest or as optional add-ons, out with core curricula.

3.2 | Teaching and Assessment

3.2.1 | Teaching

Ten respondents reported that their programme applied the iADH curriculum (83.3%), one was unsure (8.3%) and one did not (8.3%). Figure 1 maps when content was delivered relating to each learning outcome. One respondent reported that Domain 1 and Domain 4 were not covered at all. Most content was delivered in third and

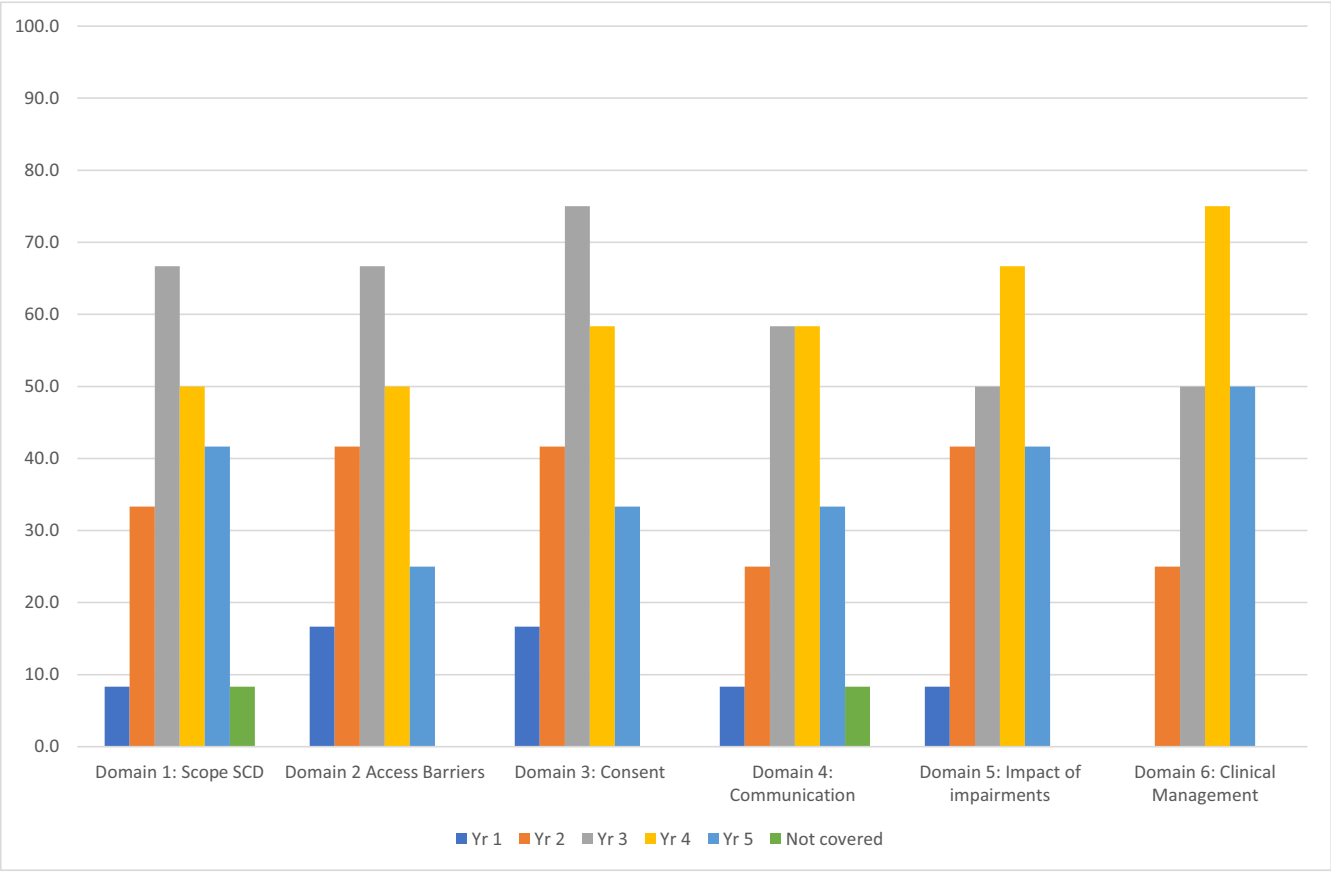

FIGURE 1 | Delivery of iADH curriculum domains by year (%).

fourth year, with a tendency for barriers to care (Domain 2) and consent issues (Domain 3) to be covered in earlier years, whereas clinical management (Domain 6) and impact of impairment (Domain 5) were covered in later years. Free text responses indicated that SCD courses were often delivered in later years of BDS programmes, often aligned with non-SCD specific modules.

When asked how learning outcomes are delivered, lectures constituted the majority of delivery. Problem and case-based learning were the next most common formats, with observation and direct patient care less frequent (see Figure 2). Free text responses mirrored a tendency for lecture-based, didactic training, although a range of pedagogical approaches are used with clinical training sporadically available:

> Not all students will get the chance to clinically treat special care patients.

Specialists in Special Care Dentistry delivered the bulk of teaching across domains, with the remainder delivered by non-SCD specialists, dentists in Community Dental Services and colleagues from Social Science. Free text responses emphasised a dependence on specialty trainees and staff who are not employed by the host University and who are non-clinical. See Figure 3 for mapping of iADH domain coverage by educator role.

3.2.2 | Assessment

Written exams were the most frequently reported assessment method across all domains, ranging from 50% to 83% of respondents. Case studies, oral examination (vivas), and Structured Clinical Reasoning (SCR) assessments were less commonly reported. When reported, they were most frequently applied to assess communication (Domain 4) and clinical management (Domain 6). Observed Structured Clinical Examinations (OSCEs) were most commonly applied to assess consent (Domain 3); Directly Observed Practical Skills (DOPS) for clinical management (Domain 6); and Projects for the impact of impairments (Domain 5). Domains 1 and 6 were least likely to be assessed at all. See Figure 4 for mapping of iADH domain assessment method. Other methods of assessment included clinical credits, clinical assessment tools and e-portfolios. Respondents conveyed a need to improve assessment or align to broader standards across other dental disciplines, in their responses:

> We need to embrace the same clinical assessment tools as other disciplines and become part of the larger assessment programme.

3.3 | Educator's Perceptions of Teaching in SCD

Educators were asked to rate the adequacy of the SCD training that they offer to their undergraduates. All Domains were most often considered somewhat adequate, apart from Domain 5 (the impact of impairments), which was most often scored as somewhat inadequate (66.7%). Clinical management (Domain 6) was most likely to be rated as extremely inadequate (25%), while Access Barriers (Domain 2) was most likely to be rated as extremely adequate. See Figure 5 for further details. A lack of

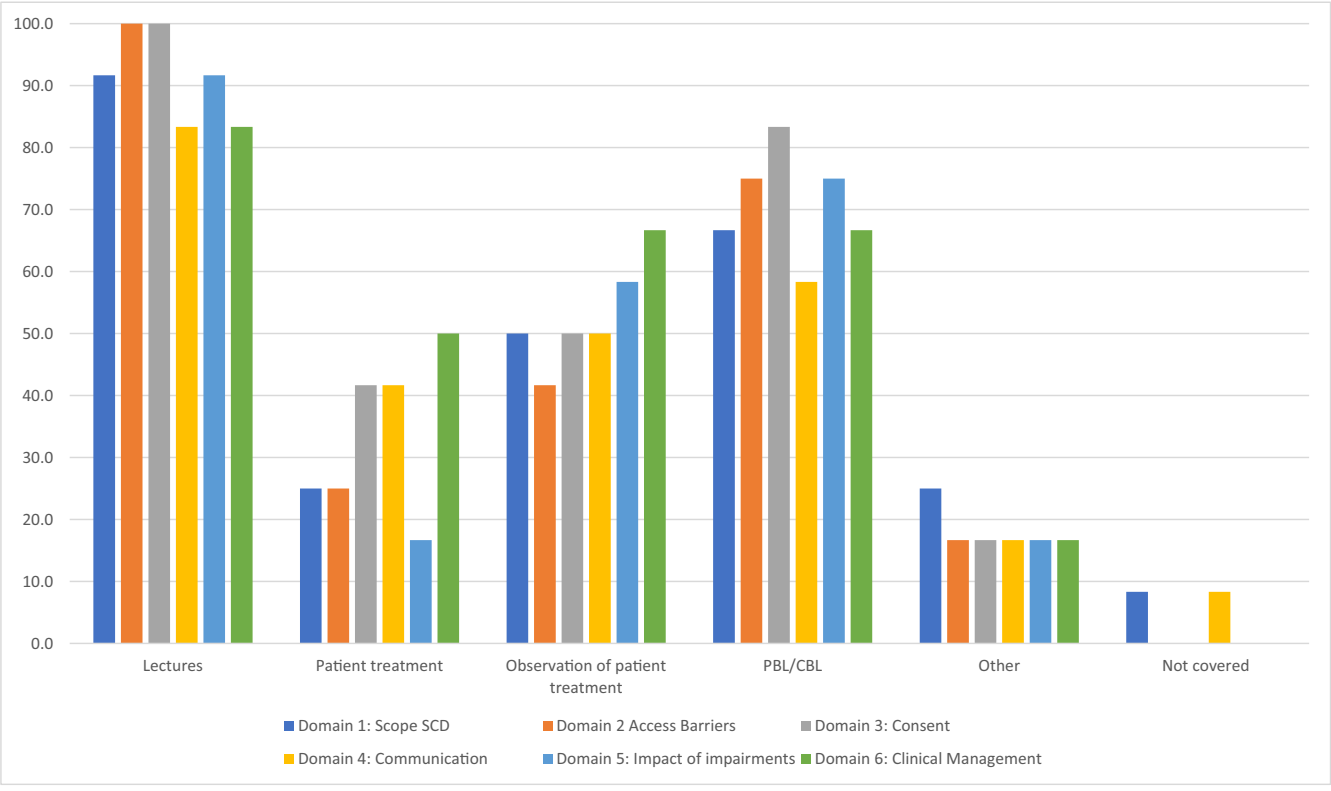

FIGURE 2 | Delivery of iADH curriculum domains by format of delivery (%).

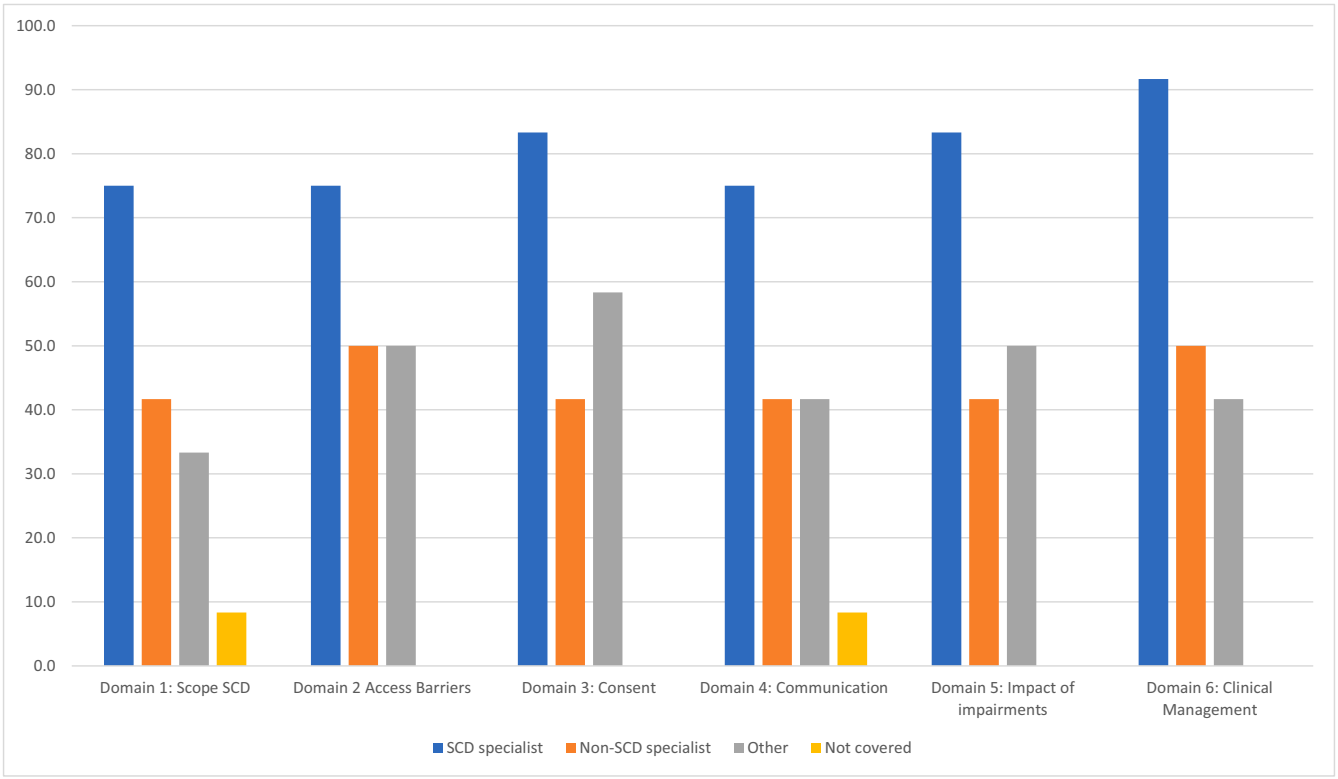

FIGURE 3 | Delivery of iADH curriculum domains by educator role (%).

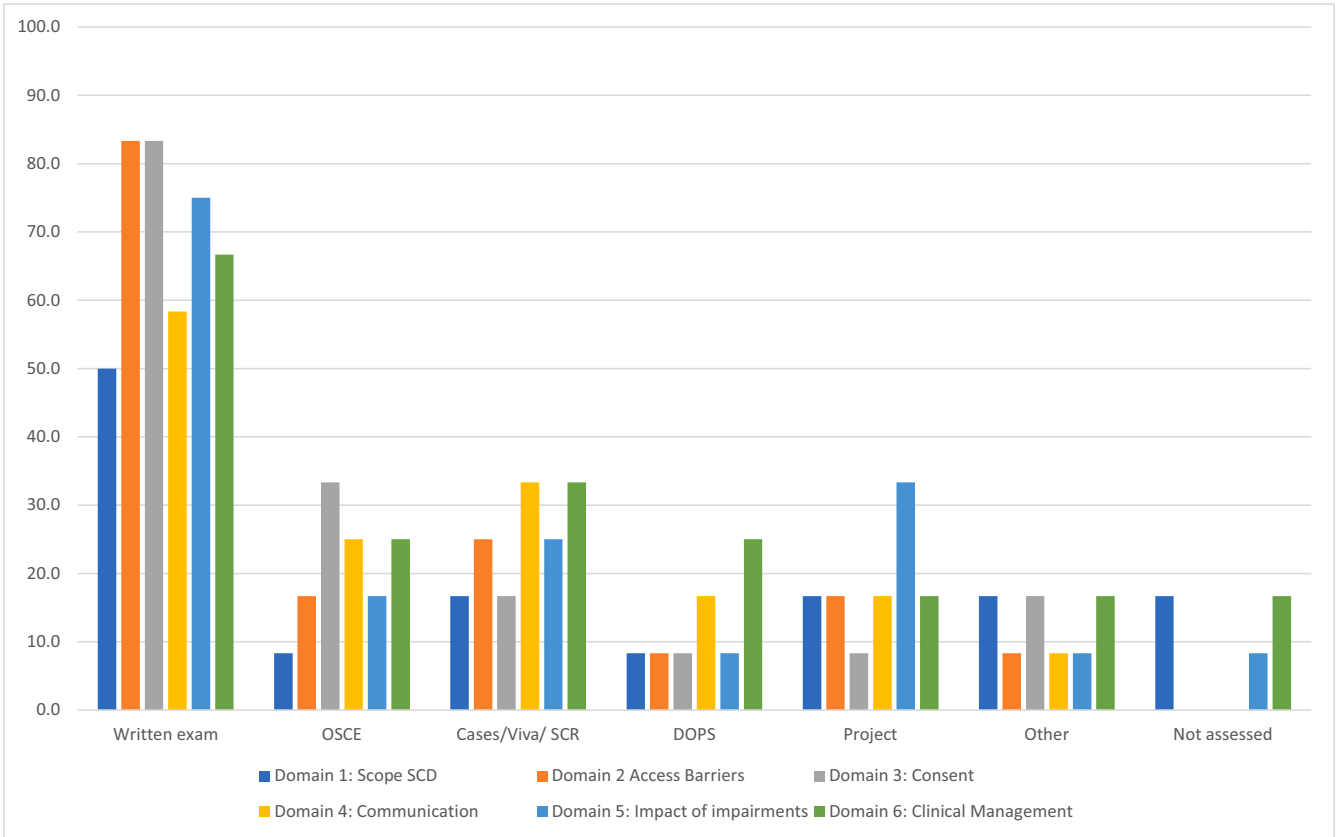

FIGURE 4 | Delivery of iADH curriculum domains by assessment method (%). DOPS = directly observed practical skills, SCR = structured clinical reasoning.

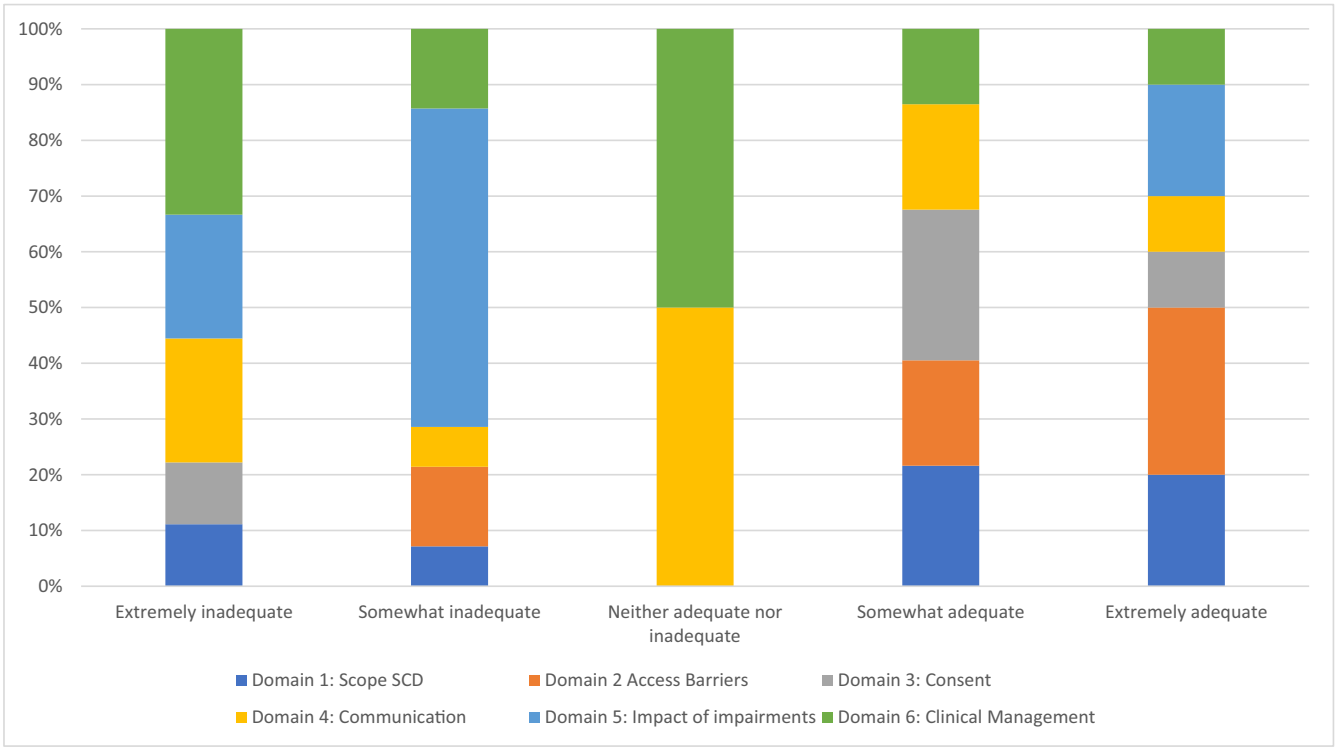

FIGURE 5 | Perceived adequacy of training across domains (%).

clinical placements and treatment was the main reason for inadequacy across programmes, as per one typical response:

> I would like students to be able to have more experience clinically treating special care patients, and generally to have more special care experience throughout their time in dental school.

When asked to share details of high standards and excellence in teaching, respondents focused on clinical exposure, staff, delivery methods and robust curriculum design. The most commonly reported contributor to excellence in SCD training was the effort invested by educators in delivering teaching. High calibre, dedicated, passionate, enthusiastic and hard-working educators were key to high quality education in SCD, with one respondent claiming that the secret to excellent teaching involved:

> Lots of hard work on many days

Core staff were enabled to deliver excellent teaching through the support of faculty, colleagues, co-teachers in non-academic roles and senior staff. Clinical exposure was deemed by educators to be especially important for high quality education in SCD, despite its rarity. Learner exposure to both sedation and specialist clinics were particularly valuable.

The mode of delivery was important for excellence in SCD education, with respondents citing use of technology, use of specific educational pedagogies, and organisation of educational activities as crucial. Strong curriculum design was evident among some respondents, particularly when programmes were newly developed, well established, or well mapped to international standards. Respondents highlighted the use of blended-learning approaches when achieving high standards, with individually listed teaching methods focusing on active and student-centred learning approaches.

3.4 | Facilitators and Barriers Delivering Curricula

As can be seen in Figure 6, availability of academic SCD staff and emphasis on SCD within the curriculum were most frequently perceived as facilitatory. The greatest facilitator reported in open text responses was support from senior colleagues and management. This is typified by the response from one educator:

> Support from Senior Management Team to create opportunities for SCD and begin to open up pathways to develop SCD. Recognition that SCD requires its own course that needs to be led by people who practice SCD.

The most frequently reported barrier was attitudes of other academic staff towards SCD (Figure 6). One respondent described a pilot project which enabled students to gain clinical experience of patients with disabilities, which ceased as it was: 'politically unpopular, outside of disability.' Another educator perceived similar peer resistance: 'clinical tutors generally aren't so happy to see special care patients.' In undergraduate clinical training settings, supervisors may lack the training and attitudes to support students to treat patients with disabilities. The limited pool of potential educators in both specialist and generalist settings were reported as barriers. Barriers also arose in the gap between current training modalities and the specific educational context needed for excellence in SCD

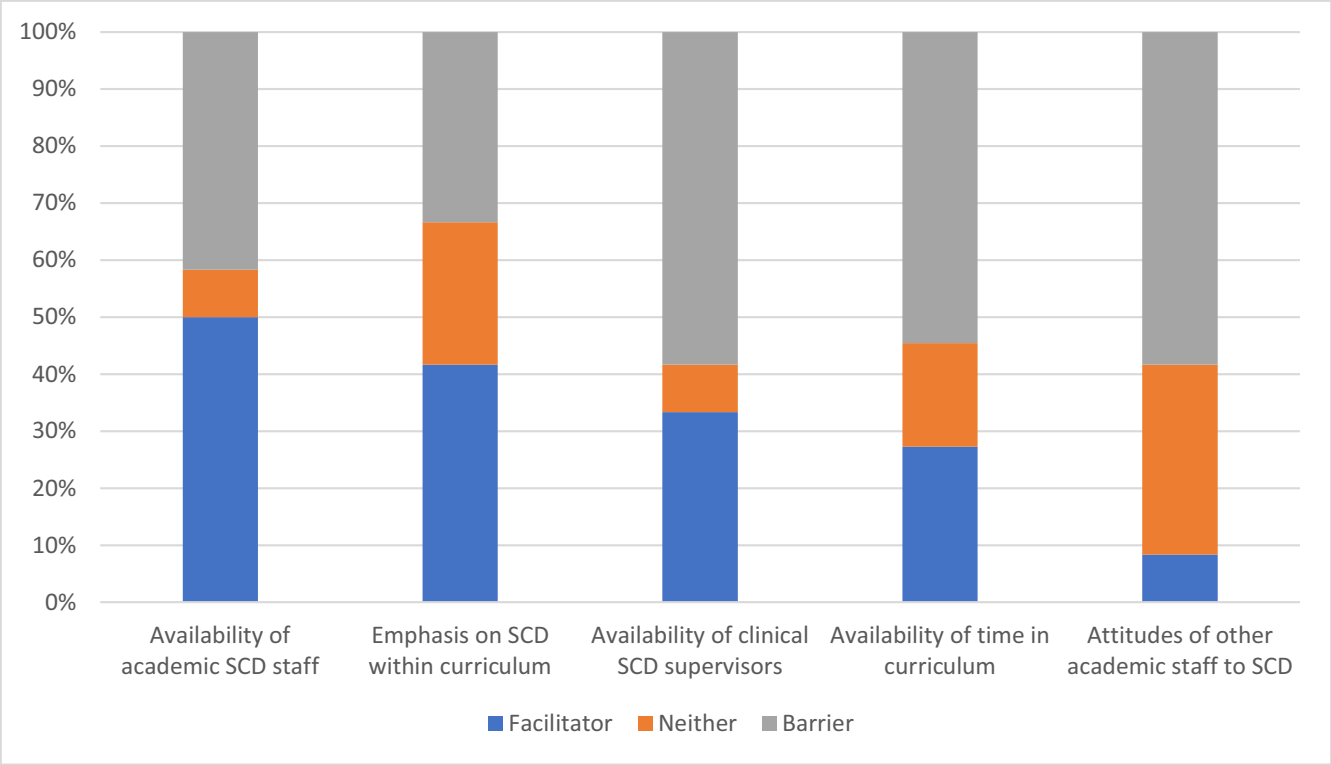

FIGURE 6 | Barriers and facilitators for delivery UG SCD course (%).

learning. For example, one respondent felt that SCD content was currently 'lost' amidst other topics, because the SCD component was not situated within its own module. Other barriers included a lack of resources, lack of standardisation of curriculum, and a need to balance responsibility for service delivery with the need to educate the future workforce to serve the community.

3.5 | How to Improve SCD Teaching

To improve the quality of teaching, respondents highlighted the need for collaboration between all providers involved in undergraduate teaching including NHS stakeholders (UK respondents), partners in health and social care, and indeed, other universities. When exploring specific recommendations for the improvement of the SCD curriculum, respondents focused on updating the Learning Outcome (LO) within SCD curricula and the General Dental Council's education framework to ensure SCD is embedded in undergraduate education. Updates to SCD LOs were perceived as needing: "to reflect the population and the scope of SCD (which) has expanded since the last review of the curriculum." Respondents expressed a need for curricular standardisation across academic institutions.

Improvement was felt to require increased clinical exposure. One typical respondent noted that learners should have: 'the opportunity to treat SCD patients on clinics.' Downstream, this would allow patients to be: 'seen closer to home, (with) better continuity, (and) disease managed earlier by graduating dentists'. Thus, having an overall impact on Special Care Dentistry service provision and development as it could lead to: 'fewer referrals into specialist services—which eventually is more cost effective.'

The need for a greater workforce with necessary skills to deliver learning outcomes is evident throughout the responses obtained, not only for clinical teaching but also to provide trained academics who possess the necessary skillset to deliver a high-quality curriculum so as to have: 'academic staff members trained in SCD to deliver the curriculum via all methods'.

4 | Discussion

This study identified huge variation in how Special Care dentistry is taught across schools in Ireland and the UK. Despite most adhering to the same curricular standards [14], teaching varied significantly. On average, less than 50 h were dedicated to SCD learning, ranging dramatically across schools. This compared to a mean of 33 h in 2007, with a similar range [18]. Persistently, SCD training represents a tiny fraction of the minimum 5000 h that constitute dental UG programmes.

Importantly, only a fraction of this time was spent patient-facing. Students reportedly received a median of 6.5 h observing patient care and 7 h providing treatment over the course of their training. Unsurprising, therefore, that the teaching of *Clinical Management* was the most likely iADH domain to be rated as extremely inadequate by educators. This represents a similar exposure to hands-on care in 2007 (median = 0 h, mean = 13.7 h, range = 0–54 h), and increase in student observation of treatment (median = 0 h, mean = 0.86 h, range = 0–6 h) [18]. Need to dramatically increase direct

student treatment of patients with disabilities in undergraduate programmes, to adequately prepare them for the population whom they will serve in practice in the primary care setting upon graduation [11, 13, 20].

The range of staffing levels and staff to student ratios was notable across the UK and Ireland. Estimated student to staff ratios were high for SCD, undulating across programmes. Teaching staff WTEs ranged from 0 to 2.5, with a median of 0.8. By comparison, a study of undergraduate oral surgery education found 55 academic oral surgery staff in 13 surveyed schools, and still cited a lack of academic staff as a barrier to education [21]. Data from the Dental Schools Council reports 10.8 WTE employed in SCD academic roles in the UK [22]. Given responses from 12 dental schools, with a median of 0.8 and mean of 1 WTE, the equivalence values for WTE being 9.6 and 12 respectively, this survey confirmed expected values. Of all the dental specialties in the UK, SCD has the fourth fewest number of clinical academics employed, with Restorative dentistry having the greatest with 177.6 WTE, a workforce 16.4 times greater than SCD. Considering changing demographics, health inequity, access desserts and the growing recognition of rights of people with disabilities, these findings suggest an urgent need to vastly increase the number of SCD educators in dental academic institutions. The delivery of quality undergraduate education in Special Care Dentistry must also be standardised across schools, if the vast majority of people who experience disability are to access dental care in the primary care setting, equitably [12].

Lectures were the most frequently reported pedagogical approach, often delivered in early years, whereas, clinical observation and treatment delivery occurred later. These findings demonstrate little shift from the lecture-obsessed curricula of 2007, when 62.4% of SCD teaching hours were assigned to lectures, despite dramatic advances in pedagogy over this time [18]. Reliance on lectures, a teacher-centred approach with vertical transmission of information, which promotes passivity in the learning experience [23], was disappointing. While active learning was evident to some extent, the results indicate the need to enhance student-centred inquiry-based teaching methods, for example, through CBL and PBL in SCD. This will enhance skills such as self-directed learning, critical thinking and problem solving [24–26], skills that are especially relevant in SCD. However, these techniques are often resource and labour intensive [27], and this survey found that SCD staff numbers are low and resources are limited. This likely favours the use of lecturing for reasons of economy, efficiency and capacity, rather than to maximise the learning experience. Assessment was also suboptimal, adopting written examination in the main, despite recognised limitations of this format in the measurement of clinical performance [28]. Again, *Clinical Management* was the least likely iADH domain to be assessed. These findings suggest plenty of opportunity to improve the delivery and assessment of SCD teaching through increased capacity.

The reported barriers and facilitators to delivering excellence in SCD teaching echoed quantitative results. Many respondents highlighted attitudes of other academic staff towards SCD as a barrier. The lack of clinical exposure was another significant barrier. Low numbers of SCD teaching staff also impacted perceived standards. Respondents recognised the need for engagement with stakeholders and updating and standardising SCD teaching and curricula. This work illustrates that SCD educators perceive a need for further development of the curriculum. Suggestions to improve education included integration of SCD into the wider dental curriculum, increased student clinical exposure, and an accompanying increase in academic SCD teaching staff numbers.

The greatest strength of this study lies in its novelty. While similar studies have been conducted in North America, Australia and Malaysia [16, 17], this is the first of its kind in the UK and Ireland in almost 20 years [18]. Both this study and the 2007 study found a response rate of between 60% and 67%, which is low for educational research, despite a rigorous recruitment process, which introduces potential bias [29]. Respondents may not be representative, with the possibility of selection bias impacting the results. This is particularly relevant given the massive range in SCD education across schools. It is likely that dental schools with stronger SCD emphasis were more likely to have replied suggesting that the true situation may be worse in those schools that did not respond. This study represents the perspectives of the academic SCD community and is therefore missing perspectives of other key stakeholders, notably, the perspective of learners, as well as educators outside of SCD and those employed across clinical services.

Based on the results of this study, the following recommendations can be made. To ensure delivery of quality undergraduate curricula in SCD across the UK and Ireland:

- The British Society for Special Care Dentistry should issue guidance on standardisation of curriculum across the UK. This should include guidance on stakeholder involvement, staff to student ratios and staffing levels, hours of teaching, methods of teaching, content and assessment methods. International curriculum standards should act as a framework from which to develop this guidance and should also prescribe minimum standards to optimise and standardise delivery and learning. The role of the Irish Society for Disability and Oral Health should be explored in this process.
- Students should receive comparable opportunities to directly treat people with disabilities across undergraduate programmes. The amount of exposure should be set to agreed standards. Observation of treatment should follow suit.
- Stakeholders should be engaged appropriately in the development and embedding of SCD curricula, including the population served, learners, school leadership, leadership of public dental services, non-specialist clinical educators, and SCD clinicians and academics.
- Stakeholders should explore the importance of education as a means of ensuring equitable delivery of care to the population served, regardless of ability.
- The academic workforce should be sufficient in number, training, and skills to deliver quality evidence-based learning in SCD that ensures graduates can care for the population they serve.

– Education in SCD should be evidence based across Ireland and the UK.

5 | Conclusion

The delivery of teaching of SCD in dental schools in the UK and Ireland continues to be markedly varied in 2024, with many educators suggesting that the delivery of teaching should be improved. Barriers include a lack of direct clinical treatment, teaching staff numbers and training, and a lack of integration of SCD into the wider curriculum. Little has improved over 20 years despite the emergence of SCD as a specialty in the UK and advances in pedagogy. Meanwhile, previously collected evidence that improvements in SCD undergraduate teaching were needed has gathered dust. There is a need for curriculum overhaul to standardise the experience for undergraduates across Ireland and the UK, so as the future dental profession is adequately and equitably equipped to deliver care to the whole of society, regardless of ability.

Author Contributions

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Data S1:** eje70115-sup-0001-Supinfo1.docx.