

Keep My Teeth: An evaluation of multi-disciplinary training in mouth care for people with intellectual developmental disorders

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Abstract

Aim: To evaluate a modular didactic training intervention called *Keep My Teeth* designed by special care dentists, for a range of healthcare students to provide oral homecare for people with intellectual developmental disorders (PwIDD).

Methods: To evaluate the intervention a *one-group pre-test post-test pre-experimental* research design was utilized. The intervention was delivered by virtual platforms or face-to-face, with a sub-sample of participants also receiving practical training. Healthcare students included Speech and Language Therapy (SLT), Registered Nurse Intellectual Disability (RNID), Dental Science (DS), Dental Nursing (DN), and Dental Hygiene (DH).

Results: Sixty-three of the 147 trainees completed all surveys. A significant change in perspective on barriers was seen for most groups post-training, with an increase in confidence in delivering oral care to PwIDD across disciplines; 67% of DH/DN students who took part in the practical training felt that the didactic training was just as effective without the practical training, while 42% of the DS students felt that was true.

Conclusions: The training interventions provided seem to have increased the awareness of study participants in relation to barriers to care, and increased their self-efficacy towards, and intention to perform, oral homecare behaviors.

KEYWORDS

health, intellectual developmental disorder, intervention, oral care, oral hygiene, training

1 | INTRODUCTION

Intellectual developmental disorder (IDD) is a term given to a group of developmental conditions characterized by significant impairment of cognitive functions, which are associated with limitations of learning, adaptive behavior, and skills.¹ People with IDD (PwIDD) experience terrible

oral health outcomes and research consistently finds dense disease burden among PwIDD, which speaks of massive health inequality.^{2–4} Taking Ireland as an example, there is such inequity that, by the time adults reach older age, they are twice as likely to be edentulous, if they have an IDD. When this happens, PwIDDs are left orally disabled, while the general public tend to be rehabilitated.⁵ Outcomes like

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this fly in the face of the United Nations Convention on the Rights of People with Disabilities (UNCRPD), which aims to ensure that health professionals provide quality care and prevent further disablement for people with disabilities.⁶ A means of preventing oral diseases among PwIDD is therefore needed to achieve UNCRPD goals.

Given the reliance that PwIDD often have on carers for activities such as feeding and tooth brushing, many efforts to improve oral health for this group are directed through carers. Usually this is via skills-based intervention such as mouthcare training.⁷ These interventions, however, do not demonstrate effectiveness, as clinical benefits of such interventions can be inconclusive.⁸ Thus, indicating a need for innovation. This will not be easy, though. Barriers, whether environmental or personal, are bountiful. PwIDD may experience atypical muscle tone, oral reflexes, or oral tactile sensitivity, which can make the placement of the toothbrush in the oral cavity difficult.^{9,10} Swallowing impairments (dysphagia), are very common in PwIDD¹¹ and the fear of aspirating saliva, toothpaste or mouthwash has been reported as leading to caregivers' distress.⁹ The mentioned problems, coupled with communication and cognitive difficulties of PwIDD, can challenge a caregivers' confidence and ability to apply oral care. Their environment matters too. Residential setting and access to support staff can also influence outcomes of mouthcare.¹² Such complexity necessitates a coordinated organizational response involving collective action, which is a challenge in itself. Research suggests that greater awareness across stakeholders is needed to improve oral care. This includes PwIDD themselves, caregivers, dental teams, speech and language therapists (SLTs), and Registered Nurses for People with an Intellectual Disability (RNIDs).^{3,9,13-15} However, changes in systems of care, such as deinstitutionalization and mainstreaming mean caregiving, its delivery and organization, is changing dramatically for PwIDD and their families.⁴

Reaching this audience in a cost-effective manner will be a challenge. The cost of practical oral hygiene training relative to its effectiveness may cause one to question whether it should be delivered at all using traditional methods.⁹ Given the likely small effect-size of such training, cost-effectiveness depends on keeping the cost of training per person as low as reasonably achievable.¹⁶ For such reasons, the appeal of moving training online is strong, particularly given recent educational shifts online. Online educational platforms offer the advantage of being relatively accessible, with the ability to reach a wider, more diverse audience efficiently, with some evidence suggesting it is not necessarily inferior to practical training in preventive oral care training.¹⁷ However, any such switch must be done with caution, as there is concern that online oral education is inadequate for psychomotor skills teach-

ing, at least in dental curricula.¹⁸ So, it seems attractive to consider moving such training online. But can psychomotor skill development occur through online training in oral hygiene? One would expect that toothbrushing, as a psychomotor skill, should require hands on training to impart competence, but it is not known if the extra cost is justified. What is clear is that research is required to understand the potential for effective training.

In this study, the research team aimed to deliver a pilot training programme in oral care to trainees from multiple professions. This programme is called *Keep My Teeth* and aims to address some of the challenges outlined above. The programme is targeted at trainees from dental, caring, and nursing professions, as well as families and, people with disabilities themselves. In this study, the effectiveness of a pilot version of this training programme is measured when delivered to a number of professions. Change in perceived barriers, self-efficacy, and intended behavior was evaluated. Change was then measured across professional groups. Lastly, the researchers aimed to test if added practical training was considered an additional benefit for a subsample who received it.

2 | METHODS

2.1 | Design

A *one-group pre-test post-test* evaluation of computer based training module was adopted for students to evaluate the didactic training intervention. Two-weeks later, a sub-sample received additional practical training. Their feedback of the perceived additional benefit of this element is also presented.

2.2 | Population and sampling

Total population sampling was applied. All four groups who attended *Keep My Teeth* training from February to June 2022 constituted the population under study. They were Trinity College Dublin students of: third year Dental Science (DS; $N = 48$), second year Dental Hygiene (DH) and Dental Nursing (DN) (combined $N = 25$), and first year Intellectual Disability Nurse students (RNID; $N = 35$). The fourth group included 39 members of a Special Interest Group of Speech and Language Therapists (SLTs)/SLT trainees. The practical training session was only accessible to DS, DN, and DH students ($N = 73$). No power calculation was undertaken.

2.3 | Intervention

The TiDiER checklist serves as a guide for better reporting of interventions in all evaluative studies, with special

emphasis on key information that should be included in trial reports.¹⁹ According to TiDiER criteria, the intervention can be described as follows.

2.3.1 | Rationale

Keep My Teeth was delivered to increase motivation and capability of trainees in two oral hygiene behaviors: *mouthcare* and *mouthcare planning* for people with disabilities. Didactic training aimed to increase intrinsic motivation by (a) specifying the behaviors trainees can undertake to prevent oral disease and the evidence supporting these behaviors and (b) highlighting the importance of oral health with emphasis on health disparities. Psychological capability was targeted through demonstration of how to plan mouthcare and how to brush teeth using resources from www.brushmyteeth.ie. *Practical training*, for those who received it, aimed to change behavior through practice and problem solving (practical capability).

2.3.2 | Materials

Microsoft PowerPoint presentations were developed for delivery of the didactic element over four short lessons. Zoom was used for online delivery. The learning outcomes of these sessions are outlined below in Figure 1. Practical training was facilitated with mouthcare plans, regular brushes, superbrushes (triple headed toothbrush intended for effective cleaning on all surfaces of teeth), PPE, and clinical waste disposal facilities.

2.3.3 | Procedure

Didactic training was delivered over a single 2-hour session for all trainees. The sequence for hands on training was as follows: Introduction was followed by a series of *pair*, *share*, and *share* procedures. Starting with low support needs for tooth brushing using a regular toothbrush, partner A brushed partner B's teeth with a regular toothbrush, followed by feedback from A to B and B to A. Next, came sharing feedback across the class. The next task was to watch an instructional video (Video three www.brushmyteeth.ie). Then, the same paired trainees brushed each other's teeth again, this time matching their brushing and their advice to what was shared in tooth brushing videos. Lastly, this step was repeated using superbrushes and a final discussion was had to encourage practice transfer.

2.3.4 | Mode of delivery, location, and time

Training was delivered to groups at three separate points of time. RNIDs were trained online using a synchronous webinar for 2 hours in February 2022, and SLTs in June 2022. DS, DN, and DH students were trained together for 2 hours February 2022, face-to-face in Trinity College Dublin, with the practical element 2-weeks later for 40 minutes each in a clinical skills lab at the Dublin Dental University Hospital.

2.3.5 | Tailoring and modification

The intervention was broadly similar for all training groups. Modification was made for dental versus non-dental trainees as noted in Figure 1. This aspect was closely recorded to allow a deeper understanding of similarities and divergence in content to explore the feasibility of a single intervention for all trainee groups.

2.4 | Data collection

Information regarding the study and a link to the pre-survey were sent to all participants prior to training. Participants were given the choice to opt in or out. A Qualtrics survey was sent to all students and was initiated before the didactic training. This same survey was repeated immediately after this training. For the practical training, a link was sent to all trainees immediately following training and completed at the end of training session.

2.5 | Data collection instrument

Participants firstly recorded age, gender, professional role, and past experience of tooth brushing and mouthcare planning for dependent adults. Then they rated their belief that brushing people with disabilities' teeth was important. Next came items for completion pre- and post-training. Firstly, participants were asked to select from a list which items they felt were barriers to mouthcare for people with disabilities, recorded dichotomously. Next, participants were asked to score 11-point Likert scales recording their self-efficacy and intentions relating to a number of mouthcare related behaviors including: planning mouthcare, delivering mouthcare, demonstrating mouthcare, modifying mouthcare advice for carers, and directing others to resources on mouthcare. Lastly, participants were asked if they wanted more training.

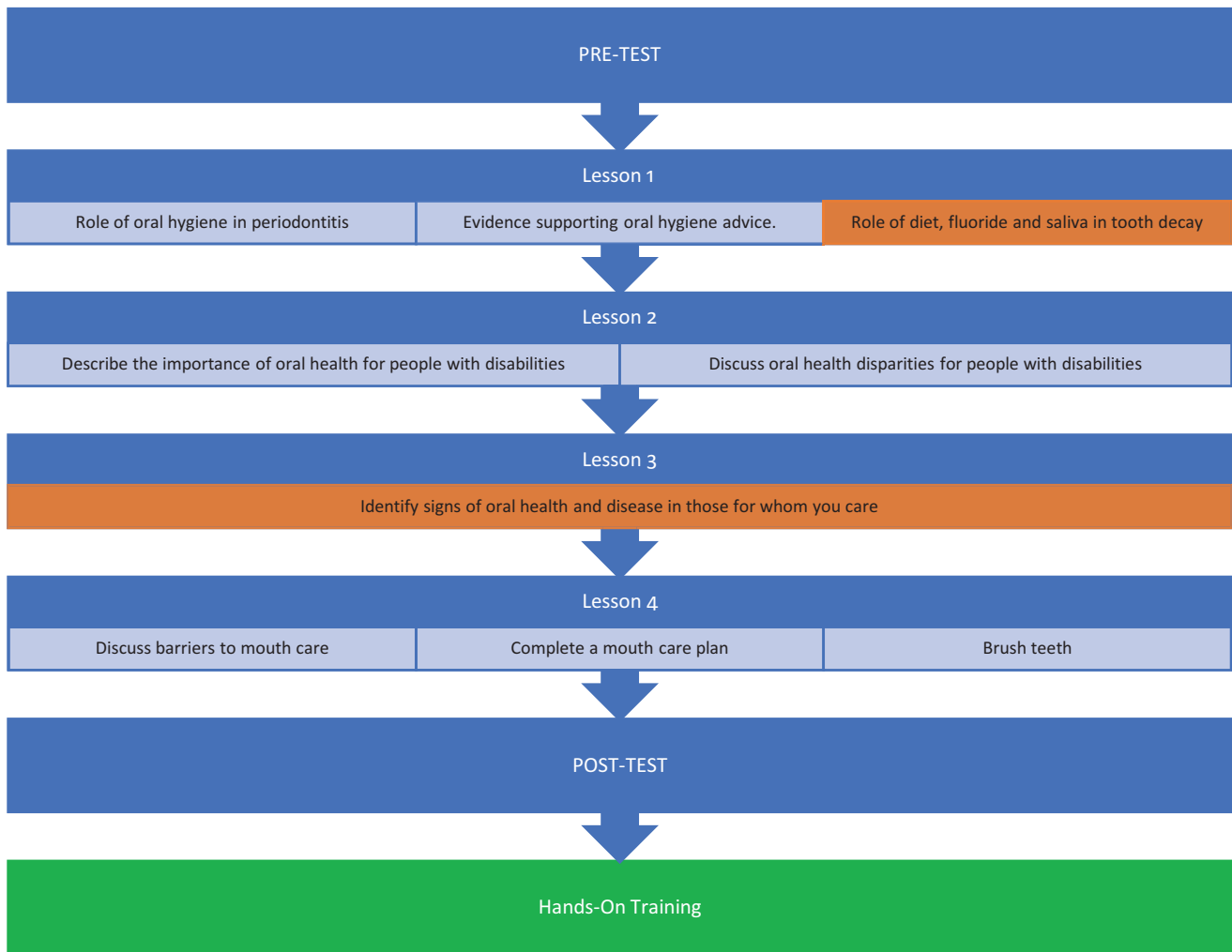


FIGURE 1 Educational plan overview of “Keep My Teeth” training. Orange: element necessary for non-dental only; Green: element delivered to dental trainees only.

2.6 | Data analysis

Responses were entered into SPSS v.22. Descriptive data were presented using central tendency and distribution or frequencies as indicated. Likert scales were dichotomized (agree vs. neutral/disagree). McNemar Chi square test for paired nominal data was applied to pre-/post-data relating to perceived barriers to mouthcare, self-efficacy, and intentions. Open ended feedback regarding hands on training was reviewed qualitatively.

3 | RESULTS

3.1 | Participant flow

From didactic training, a total of 86 surveys were returned by 147 trainees. Five respondents did not opt into the study. Thus, making the response rate at baseline 55.1% ($n = 81$;

$N = 147$). A further 18 (22.2%) were lost to follow up, giving a final sample for pre–post analyses of $n = 63$ (25 DS; 10 DH/DN; 13 RNID, 15 SLT). Figure 2 demonstrates participant flow. For *Practical training*, a subsample of $N = 73$ participants took part and data were included for 52 participants (40 DS, 12 DH/DN), of whom four did not opt in, giving a final sample of $n = 48$ and a response rate of 65.8%.

3.2 | Demographics and experience

Most participants were between 20 and 30 years of age, with the majority being female (81.0%). As Table 1 illustrates, 68.2% ($n = 43$) of participants had never brushed a person with disabilities’ teeth and 74.6% ($n = 47$) of participants had never made a mouth care plan for people with disabilities. At baseline, 98.4% ($n = 62$) of respondents reported that brushing the teeth of people with disabilities is important. Subgroup analysis by profession revealed that

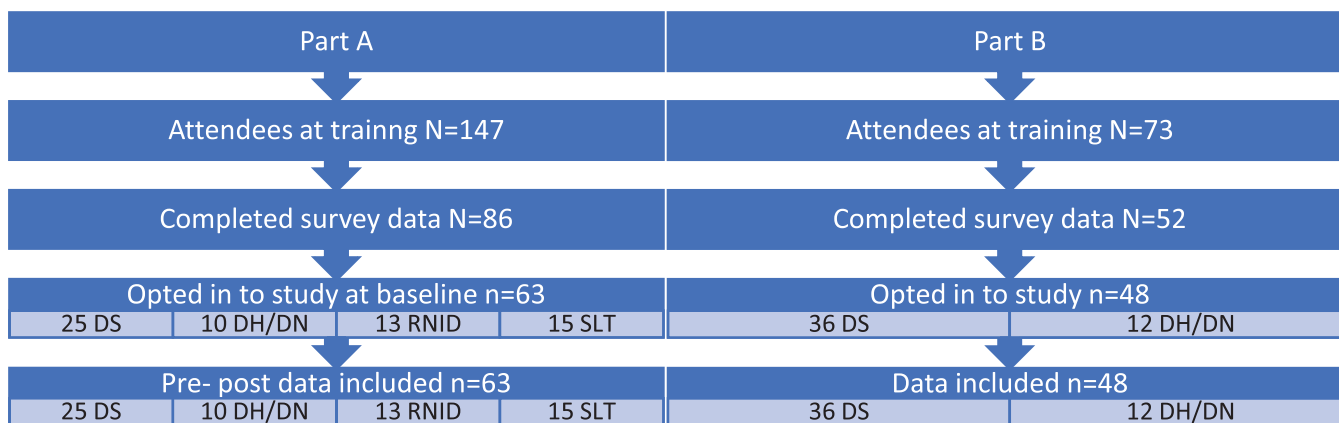


FIGURE 2 Participant flow. Part A: participants for didactic training. Part B: participants for the practical training.

TABLE 1 Demographics and experience.

	Total (63) n (%)	DS (25) n (%)	DH/DN (10) n (%)	RNID (13) n (%)	SLT (15) n (%)	X ²
Gender						
Male	12 (19.0)	10 (40.0)	0	2 (15.4)	0	***
Female	51 (81.0)	15 (60.0)	10 (100)	11 (85.6)	15 (100)	
Age						
Under 20	9 (14.3)	3 (12.0)	2 (20.0)	4 (30.8)	0	
20–25	22 (34.9)	16 (64.0)	1 (10.0)	3 (23.1)	2 (13.3)	
25–30	14 (22.2)	6 (24.0)	5 (50.0)	1 (7.7)	2 (13.3)	
30+	18 (28.6)	0.0	2 (20.0)	5 (38.5)	11 (73.3)	
Previous experience with tooth brushing for dependent adults						
Never	43 (68.3)	23 (92.0)	6 (60.0)	6 (46.2)	8 (53.3)	***
1–10	9 (14.3)	1 (4.0)	2 (20.0)	2 (15.4)	4 (26.7)	
10–50	6 (9.5)	1 (4.0)	1 (10.0)	1 (7.7)	3 (20.0)	
50+	5 (7.9)	0	1 (10.0)	4 (30.8)	0	
Previous experience with mouthcare plan for dependent adults						
Never	47 (74.6)	20 (80.0)	7 (70.0)	10 (76.9)	10 (66.7)	5 NS
1–5	12 (19.0)	2 (8.0)	3 (30.0)	3 (23.1)	4 (26.7)	
5–10	2 (3.2)	2 (8.0)	0	0	0	
10+	2 (3.2)	1 (4.0)	0	0	1 (6.7)	

Abbreviations: DH, Dental Hygiene; DN, Dental Nursing; DS, Dental Science; NS, non-significant; RNID, Registered Nurse Intellectual Disability; SLT, Speech and Language Therapy; % presented to nearest whole number.

*** $p < 0.001$;

groups were dissimilar according to gender distribution and previous experience of tooth brushing for people with disabilities. The most experienced groups regarding tooth-brushing were RNIDs (54.0%), followed by SLT (47.0%), DH/DN (40.0%), and DS (8.0%).

3.3 | Barriers to mouthcare at baseline and repeat

As seen in Figure 3A, the most commonly reported barriers at baseline were resistance to care ($n = 51, 80.9%$), access

to care ($n = 51, 80.9%$), and practical difficulty ($n = 49, 77.8%$). Proportional change from baseline was found to be statistically significant for time pressure (+68.9%, $p < .001$), demotivation (+68.0%, $p < .01$), lack of adherence (+50.0%, $p < .001$), followed by competing priorities (+47.8%, $p < .01$), ethical dilemma (+47.6%, $p < .05$), and attitude toward oral health (+28.6%, $p < .05$).

Among DS, the barriers that displayed the greatest increase in awareness from pre to post-training were time pressure (+144.0%; $p < .001$) and competing priorities (+89.0%; $p < .01$); For DH/DN students this was also time pressure (+67.0%, $p < .001$); For RNIDs this was lack of

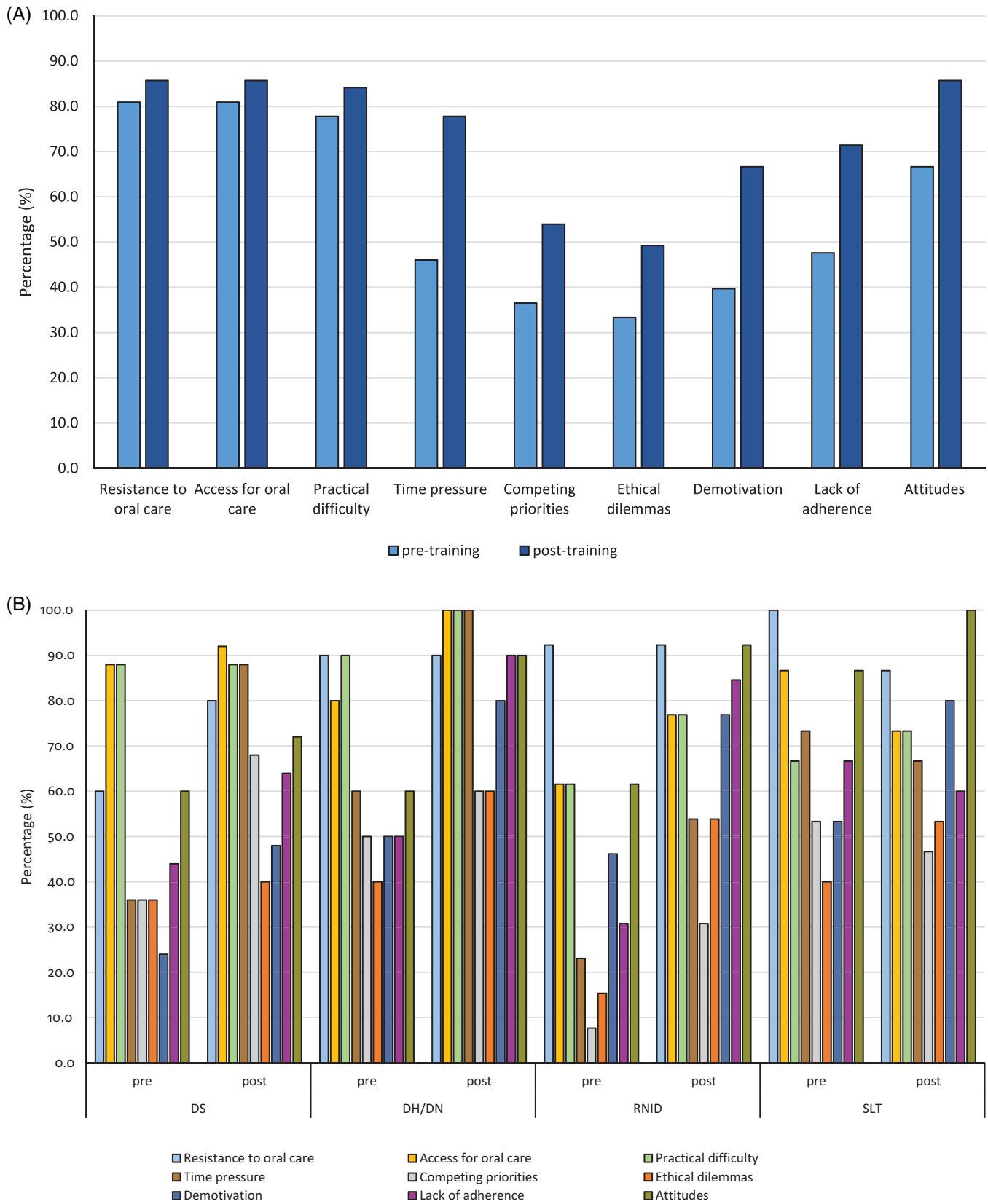


FIGURE 3 Perceived barriers expressed as percentages pre- and post-training: (A) total sample ($n = 63$), (B) across professions.

adherence (+175.0%, $p < .005$); For SLTs this was demotivation (+50.0%; NS). Figure 3B allows for inspection of responses by profession. Further break down by profession can be seen in Supplemental material 1.

3.4 | Self-efficacy and intentions

Regarding self-efficacy, there was an increase reported across all items from pre- to post-training. At pre-training, only 51.6% ($n = 32$) of the total sample felt confident planning routine mouthcare, and 47.6% ($n = 30$) felt confident delivering mouthcare. Post-training, 95.2% ($n = 60$) felt confident planning routine mouthcare and 92.1% ($n = 58$) felt confident to deliver mouthcare. Further changes in self-efficacy can be seen in Table 2.

A similar increase in reported intentions was also noted for the sample as a whole for all items from pre- to post-training. Pre-training, 79.0% ($n = 49$) of the total sample intended on planning routine mouthcare and 79.4% ($n = 50$) intended on delivering routine mouthcare. Post-training, this rose to 96.8% ($n = 60$) and 92.1% ($n = 58$), respectively. More changes on other intentions can be noted in Table 2.

Subgroup analysis by profession revealed that all groups felt significantly more confident in delivering mouthcare to people with disabilities after training. Additionally, a rise in confidence is seen across all disciplines when it comes to modifying the oral hygiene advice given to carers of people with disabilities. Subgroup analysis by profession regarding intentions revealed that pre-training, most groups, intended to deliver routine mouthcare to people with disabilities. Significant changes however can be seen in SLTs, as pre-training, only 57.1% ($n = 8$) of the total sample intended on planning routine mouthcare for people with disabilities, this rose to 93.3% ($n = 14$) post-training. Significant changes can also be noted in DS and RNIDs when asked about their intention on modifying oral hygiene advice they give to carers of people with disabilities. Pre-training, 84.0% ($n = 21$) of DS and 69.2% ($n = 9$) of RNIDs, demonstrated this intention. This rose to 100% for both DS ($n = 25$) and RNIDs ($n = 13$) post-training. Further subgroup analyses can be seen in Table 2.

3.5 | Follow-up survey

Table 3 displays feedback from a subset of the group (DS and DH/DN students) who took part in the practical training session. While 64.6% ($n = 31$) of the total sample felt that the practical aspect of the training was helpful, 47.9% ($n = 23$) felt that the training was just as good without

the practical training. Majority (62.5%, $n = 30$) felt that the training program was pitched at the right level for them; however, 64.6% ($n = 31$) felt that they still need more training to do their job well. Further analysis highlights an interesting distinction between subgroups, as 66.7% ($n = 8$) of DH/DN students felt that the online training was just as effective without the practical training, while only 41.7% ($n = 15$) of the DS students felt that this was true.

Qualitative feedback was gathered through one open-ended question: What extra did the practical aspect of this training add for you? Apart from one student, the rest of the sample perceived the practical part as “extremely useful,” “invaluable,” and providing a “deeper understanding”. The key benefits identified by the students included positioning, placement of the toothbrush in the mouth, and practicing using different toothbrushes. In addition, the practical session was reported to help the students realize the importance of communication with the patient when applying oral care, including knowing what questions to ask and gaining consent.

4 | DISCUSSION

4.1 | Summary of main results

The *Keep My Teeth* intervention was associated with an increase in self-efficacy and intention in relation to a range of oral hygiene promoting behaviors, such as mouthcare planning, delivering mouthcare, modifying mouthcare, and mouthcare advice. This was true for all professional groups trained. Thus, a single intervention tailored to multi-professional groups is a feasible mean of increasing self-efficacy and intentions for both dental and non-dental groups.

Before training, access and resistance to oral care were most often perceived barriers across the sample, joined by attitudes as a barrier following training. The greatest increase in perceived barriers from pre- to post-training was observed relating to demotivation and time pressure. The sub-group analysis revealed that barriers were perceived differently across professions. For example, while DS most often reported access to oral care and practical difficulties pre-training, all other groups reported resistance to care most often. This likely represents a lack of interaction among DS students with actual patients with disabilities, relative to other groups. Change in perceived barriers post-training was also different across groups. For DS and DH/DN, the greatest increase was regarding time pressure, for RNID it was lack of adherence, and finally for SLTs it was demotivation. Again, this may be explained due to groups' different understandings of the context of routine oral homecare. While dental professionals

TABLE 2 Self-efficacy and intentions.

	Total (n = 63)				DS (n = 25)				DH/DN (10)				RNID (n = 13)				SLT (n = 15)								
	Pre		Post		Pre		Post		Pre		Post		Pre		Post		Pre		Post						
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%					
I feel confident to plan routine mouthcare for people with disabilities																									
Disagree/neutral	30	48.4	3	4.76	***	14	58.3	1	4.0	***	3	30.0	0	0.00	4	30.8	0	0.00	*	9	60.0	2	13.3	**	
Agree	32	51.6	60	95.2		10	41.7	24	96.0		7	70.0	10	100.0	9	69.2	13	100.0		6	40.0	13	86.7		
I intend to plan routine mouthcare for people with disabilities																									
Disagree/neutral	13	20.6	2	3.20	***	4	16.0	1	4.0		2	20.0	0	0.00	1	7.76	0	0.00		6	42.9	1	6.66	*	
Agree	49	79.0	60	96.8		21	84.0	24	96.0		8	80.0	9	90.0	12	92.3	13	100.0		8	57.1	14	93.3		
I feel confident to deliver routine mouthcare for people with disabilities																									
Disagree/neutral	33	52.4	5	7.93	***	14	56.0	2	8.0	***	4	40.0	0	0.00	*	6	46.2	0	0.00	**	9	60.0	3	20.0	*
Agree	30	47.6	58	92.1		11	44.0	23	92.0		6	60.0	10	100.0	7.00	53.8	13.0	100.0		6	40.0	12	80.0		
I intend to deliver routine mouthcare for people with disabilities																									
Disagree/neutral	13	20.6	5	7.93	***	4	16.0	1	4.0		1	10.0	1	10.0	0	0.00	0	0.00		8	53.3	3	20.0		
Agree	50	79.4	58	92.1		21	84.0	24	96.0		9	90.0	9	90.0	13.0	100.0	13.0	100.0		7	46.7	12	80.0		
I feel confident to demonstrate routine mouthcare for people with disabilities																									
Disagree/neutral	32	50.8	3	4.80	***	11	44.0	1	4.0	***	2	20.0	0	0.00	8	61.5	0	0.00	***	11	73.3	2	13.3	***	
Agree	31	49.2	60	95.2		14	56.0	24	96.0		8	80.0	10	100.0	5	38.5	13	100.0		4	26.7	13	86.7		
I intend to demonstrate routine mouthcare for people with disabilities																									
Disagree/neutral	13	20.6	3	4.80	***	4	16.0	0	0.0	*	0	0.00	0	0.00	3	23.1	1	7.7		6	40.0	2	13.3		
Agree	50	79.4	60	95.2		21	84.0	25	100.0		10	100.0	10	100.0	10	76.9	12	92.3		9	60.0	13	86.7		
I feel confident modifying the oral hygiene advice I give to carers of people with disabilities																									
Disagree/neutral	32	50.8	1	1.6	***	13	52.0	0	0.0	***	5	50.0	0	0.0	**	5	38.5	0	0.0	*	9	60.0	1	6.70	**
Agree	31	49.2	62	98.4		12	48.0	25	100.0		5	50.0	10	100.0	8	61.5	13	100.0		6	40.0	14	93.3		
I intend to modify the oral hygiene advice I give to carers of people with disabilities																									
Disagree/neutral	13	21.0	1	1.60	***	4	16.0	0	0.0	*	1	10.0	0	0.00	4	30.8	0	0.0	*	4	28.6	1	6.70		
Agree	49	79.0	62	98.4		21	84.0	25	100.0		9	90.0	10	100.0	9	69.2	13	100.0		10	71.4	14	93.3		
I feel confident directing others to resources about routine mouthcare for people with disabilities																									
Disagree/neutral	29	47.5	1	1.6	***	13	56.5	1	4.0	***	3	30.0	0	0.00	7	53.8	0	0.0	**	6	40.0	0	0.0	**	
Agree	32	52.5	62	98.4		10	43.5	24	96.0		7	70.0	10	100.0	6	46.2	13	100.0		9	60.0	15	100.0		
I intend to direct others to resources about routine mouthcare for people with disabilities																									
Disagree/neutral	7	11.1	0	0.0	***	2	8.0	0	0.0		1	10.0	0	0.0	1	7.70	0	0.0		3	20.0	0	0.0		
Agree	56	88.9	63	100.0		23	92.0	25	100.0		9	90.0	10	100.0	12	92.3	13	100.0		12	80.0	15	100.0		
I need more training in mouthcare for people with disabilities to do my job well																									
Disagree/neutral	3	4.80	19	30.2	***	1	4.0	3	12.0		1	10.0	4	40.0	0	0.00	8	61.5	***	1	6.70	4	26.7		
Agree	60	95.2	44	69.8		24	96.0	22	88.0		9	90.0	6	60.0	13	100.0	5	38.5		14	93.3	11	73.3		

Abbreviations: DH, Dental Hygiene; DN, Dental Nursing; DS, Dental Science; RNID, Registered Nurse Intellectual Disability; SLT, Speech and Language Therapy.

* $p < .05$.

** $p < .01$.

*** $p < .001$: McNemar's test.

TABLE 3 Perspectives on practical training programme.

Statements	Total (n = 48) n = Yes (%)
I found the online aspect of this training helpful	30 (62.5)
I found the practical aspect of this training helpful	31 (64.6)
I think this training was just as good without the practical training	23 (47.9)
I think Keep My Teeth training module needs the practical aspect of training to be effective	22 (45.8)
Overall the training programme was pitched at the right level for me	30 (62.5)
I need more training in mouthcare for people with disabilities to do my job well	31 (64.6)

were more likely to think that teeth are not brushed due to a lack of time, RNIDs and SLTs' understanding was more nuanced and reflects a greater understanding of the homecare context.

The above suggests that professional groups perceive barriers to oral care differently. This can be expected considering different professional scopes of practice, backgrounds, and roles. Thus, any multi-professional training programme must be designed with a recognition that all stakeholders may face their own role-specific barriers that all need to be addressed. Future multi-professional training in implementing oral care for people with disabilities must identify discipline specific changes and provide adequate solutions, through interprofessional dialogue.

Mixed results were obtained regarding practical training. Quantitatively, there was no significant benefit observed for about half of trainees, indicating that practical training may not offer perceived benefits to everyone. However, qualitative feedback told a different story. In the open-ended question, the students identified a range of benefits from the practical session, which would not have been possible if the training was fully online. This discrepancy between data sources can be explained by the informal feedback received from the students. It occurred that the practical part was not scheduled well leaving students disgruntled, which could have influenced students' attitudes. Moreover, differences in patient exposure and experience could have caused differences between subgroups. For instance, DH/DN more frequently attend Special Care Dentistry clinics, with greater exposure to disabled patients compared to DS students. This may have impacted on the perceived relevance of hands on training.

Keep my Teeth training increased participants' self-efficacy and intentions regarding oral care interventions provided for people with disabilities. When measured in similar research, self-efficacy and reported behavior have been seen to improve slightly and to varying degrees.^{8,20-22} However, the reporting of self-efficacy and behavior/intentions do not allow direct comparison to these studies.

4.2 | Implications

Keep my Teeth responds to numerous calls for further research into oral care educational strategies for PwIDD.^{3,9,13,23} The findings reported on here are likely to help to contribute to the body of knowledge in relation to educational approaches concerning oral care interventions to prepare healthcare professionals and caregivers to provide more effective oral care to people with IDD. This

study echoes calls for developing standardized training methods, tools, and a shared vocabulary to advance the quality of oral care techniques utilized in the care of people with IDD.¹³ Based on the findings here, the research team will build an online modular programme that aims to reach all stakeholders using a universal programme, with terminology of barriers clearly defined for each group. This will reduce barriers between professions by promoting unified concepts, language, and resources across silos. As each sub-group reported unique barriers to implementing oral care, this training should identify and address discipline specific issues and encourage dialogue across professional roles. There will be a need for broader evaluation. The results were mixed regarding practical clinical training. This will require further evaluation.

4.3 | Limitations

There are a number of limitations to acknowledge. The study design was limited to a pre- and post-design and sample size was small. The lack of control group limits our ability to attribute causation. Post-test data collection was conducted immediately after the intervention. Therefore, long-term impact is unknown. The McNemar test is recommended for paired binomial data.²⁴ However, caution is recommended due to the low number of discordant pairs, which may affect power. While representatives of both dental and non-dental groups were recruited, the study lacked a representation of informal carers such as relatives of people with IDD, who are often involved in providing oral care. In addition, future courses should be accessible to people with disabilities themselves to promote their engagement in oral care. However, whilst the study has its limitations, the implication of a multi-disciplinary approach in the development of blended learning approaches pave the way for interdisciplinary and integrated care. This study also provides useful progressive steps in developing interprofessional learning and supporting collaboration across universities and healthcare disciplines. Further research in this area should include larger sample sizes and control group to ideally measure long-term and distal effects.

5 | CONCLUSION

The *Keep My Teeth* intervention was associated with an increase in self-efficacy and intention in relation to a range of oral hygiene promoting behaviors and changes in perceived barriers to care. This was true for all

professional groups trained, meaning that a single intervention, with tailoring to professional groups, is a feasible means of increasing self-efficacy and intentions and of raising awareness of barriers to oral care. It is reasonable to design a single, tailorable, cross-professional training programme to increase self-efficacy and intentions regarding mouthcare for people with disabilities. The benefits of additional practical training will need further evaluation including cost effectiveness analyses.

CONFLICT OF INTEREST STATEMENT


The first author, Fargol Nowghani, was a third-year dental science student, participating in the training and completing the survey, that is being used in this study. However, at the time of training, she had no knowledge or involvement in the study. Fargol's role as a student researcher allowed for a deeper interpretation of findings, particularly qualitative findings and an understanding of the student context. There are no other conflicts of interest to disclose.

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ETHICS STATEMENT

Ethical approval was secured from the Research Ethics Committee of the School of Dental Science, Trinity College Dublin (TCD).

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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