CORA Cork Open Research Archive
Cartlann Taighde Oscailte Chorcaí

Title	Improving toothbrushing for autistic children using parental toothbrushing advice workshops
Authors	Parry, Jennifer Ann;Bullingham, H.;Newton, J. Tim;Ryan, Christian
Publication date	2026-04-01
Original Citation	Parry, J A, Bullingham, H, Newton, J T & Ryan, C 2026, 'Improving toothbrushing for autistic children using parental toothbrushing advice workshops', Journal for British Society of Special Care Dentistry, vol. 26, no. 1, pp. 28-42. https://doi.org/10.63507/IHRE9851
Type of publication	Article (peer-reviewed)
Link to publisher's version	https://www.bsscd.org/bsscd-journal-26-1-p3 - 10.63507/IHRE9851
Rights	© 2026, British Society of Special Care Dentistry.
Download date	2026-11-17 11:36:14
Item downloaded from	https://hdl.handle.net/10468/18728



UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

Improving toothbrushing for autistic children using parental toothbrushing advice workshops

Parry JA[1,2], Bullingham H[2], Newton JT[3], Ryan C [1].

1. School of Applied Psychology, University College Cork, Cork T23 TK30, Ireland
2. Special Care Dental Service, Sussex Community NHS Foundation Trust, Brighton General Hospital Elm Grove Brighton BN2 3EW
3. Centre for Oral, Clinical and Translational Sciences, King's College London, Floor 18, Guy's Hospital Tower, London SE1 1UL, UK

Correspondence to: JA Parry

Email: jennifer.parry@ucc.ie, jenniferparry@nhs.net

ABSTRACT

Aims

- To compare a sensory and behaviour focused toothbrushing guidance with traditional guidance for parents of autistic children.
- To explore attitudes of parents of autistic children towards toothbrushing, sugar snacking and dental caries.

Design

Fifty-two parents with autistic children aged 3 to 15-years participated. Group 1 parents received 'Delivering Better Oral Health' toothbrushing guidance. Group 2 parents received the "Clinical standard for oral healthcare for autistic children and young people and/or those with a learning disability in special educational settings" guidance. Randomisation occurred at school-level. Both parent groups received a Tooth Care Product Pack, completed a pre-study attitude and experience questionnaire and a toothbrushing performance questionnaire pre- and post-study. The main outcome measures were twice-a-day toothbrushing for 2 minutes and parental attitude scores.

Results

Fifty-five percent of parents with children aged 10-years and above revealed not finding toothbrushing advice provided at dental visits useful. Although the number of parents brushing twice daily in Group 2 increased post-study, this change was not statistically significant. Parental attitude scores suggest that maintaining good oral health is important to parents of autistic children. Parents provided commentary regarding workshop advice and the challenges of implementing toothbrushing guidance delivered at the workshops. Feedback indicated that for both groups a flexible approach to toothbrushing and access to products provided in the Tooth Care Pack were valuable.

Conclusions

Results suggest that provision of choice and bespoke toothbrushing guidance based on individual support needs is important when providing parental toothbrushing guidance for autistic children.

Introduction

Autism diagnosis involves identification of a dyad of characteristics relating to two areas of child development. The first area is communication and social interaction differences. The second part of the dyad refers to restricted and repetitive behaviours and interests (American Psychiatric Association, 2013). The NHS Long Term Plan 2019 includes a commitment to ensure people with learning disability and/or autism get better support (NHS 2019). Research findings suggest larger amounts of time and effort and a more active toothbrushing role practised by parents of autistic children and young people (Stein *et al.*, 2012; Du *et al.*, 2019; Chauhan *et al*., 2025). However, worse oral hygiene and gum health are consistent research findings for autistic children (Bartolomé-Villar *et al.*, 2016). Brushing twice-a-day with fluoride toothpaste is advised to maintain oral health (Trubey *et al.*, 2017; Public Health England, 2021). For good plaque removal toothbrushing last thing at night or before bedtime and one other time for around 2 minutes is the traditional guidance recommended (Public Health England, 2021). Toothbrushing for two minutes has been found to provide a 26% improvement in plaque removal compared to brushing for 45 seconds (Creeth *et al.*, 2009).

Studies investigating oral care for autistic children identified resistance to intra-oral use of toothbrushes and dislike of taste or texture of toothpastes in more than 50% of autistic children. (Stein *et al.*, 2012; Du *et al.*, 2019; Chauhan *et al*., 2025). Good oral hygiene is a matter of concern to parents/carers of autistic children, and having the “right tools” (toothbrush and toothpaste) tailored to individual sensory challenges can help (Parry *et al.*, 2021; Chauhan *et al*., 2025). The number of intervention studies seeking to identify oral health support strategies for autistic children and adolescents is low and the quality is poor (Erwin *et al.*, 2022).

In 2023 a clinical standard for oral healthcare for autistic children and young people and/or those with a learning disability in special educational settings was published by NHS England (NHS, 2023). This standard, which includes sensory and behaviour focused guidance to promote toothbrushing, was one arm of a sensory project, working alongside audiology and optometry teams. Sensory sensitivities, cognitive and physical challenges, and high support need are dental care barriers for autistic children and adolescents (Erwin *et al.*, 2022). Traditional guidance (toothbrushing twice-a-day, ideally for 2 minutes) may not be realistic and achievable for autistic children with high support needs. Advice to pursue unachievable dental selfcare standards may result in disengagement with oral healthcare.

This project aimed to

- explore whether a sensory and behaviour focused toothbrushing guidance is more effective than traditional guidance for parents of autistic children.
- explore the attitudes of parents of autistic children towards toothbrushing, sugar snacking and dental caries.

Methods

The study design involved recruitment of parents with autistic children attending special educational settings and schools providing autism support in West Sussex and Brighton and Hove (England). The design was a two arm pre- and post-intervention study. The study intervention was toothbrushing advice delivered at parent workshops. Randomisation took place at school level to provide two study groups. Group 1 parents (n = 28) received toothbrushing advice according to the traditional GOV.UK 'Delivering Better Oral Health' (DBOH) toolkit (NHS, 2021). Group 2 parents (n = 24) received toothbrushing advice according to the NHS England 2023 Clinical standard for oral healthcare for autistic children and young people and/or those with a learning disability in special educational settings (NHS,

2023). The study duration was three weeks. Prior to commencing the workshop, study participants completed a questionnaire regarding their experience and attitude towards toothbrushing, sugar snacking and dental caries for their autistic child (Supplementary Material 1). Participating parents also completed a toothbrushing assistance and duration questionnaire pre- and three weeks post-workshop (Zhou *et al.*, 2020). Participants were contacted by phone text message after weeks one and two offering a call back for further toothbrushing support. Commentary from parents gathered at workshops and call-backs was analysed using an inductive approach. Using this approach the subjective experience of the daily life of parents involved in providing oral hygiene for their autistic children was explored (Fereday and Muir-Cochrane, 2006; Swain, 2018). Sample size calculation based on the measure of toothbrushing performance (Zhou *et al.*, 2020) indicated a minimum requirement of 24 participants in each group.

Twelve schools took part in the project. Fifty-two parents participated. Each participant represented one autistic child. The age range of children was from 3-years to 15-years. Sixteen (30.8%) children were female and 36 (69.2%) males. Fifteen children (28.8%) were described by their parents as having a complex learning disability in addition to autism.

Both groups received a Tooth Care Pack (Supplementary Material 2) containing toothbrush and toothpaste products based on the Clinical standard for Special Education Settings (NHS, 2023) user guide. Group 1 participants who were given DBOH toothbrushing guidance plus toothcare products at workshops are referred to as the “DBOHplus” study group. Group 2 participants given the NHS England 2023 Clinical standard for oral healthcare for autistic children and young people and/or those with a learning disability in special educational settings (NHS, 2023) guidance, including toothcare products, are the “SES” study group. Scores for the parent experience and attitude questionnaire ranged from 1 (least positive attitude) to 5 (most positive attitude).

Following HRA and NHS Research Ethics Committee approval (IRAS ref: 331171) a recruitment poster was shared with schools. The poster offered opportunity for parents/guardians of autistic children and young people aged between 3 and 16 years, with a confirmed autistic spectrum disorder medical (private or NHS) diagnosis, to contact the research team.

The Kent, Surrey and Sussex Young People's Advisory Group (YPAG) was involved at the study planning stage. The YPAG steered the study design towards involvement of parents and carers to better understand the support needs of autistic young people. Parents of autistic young people, consulted prior to the study, advised an additional toothbrush (Brushbaby KidzSonic®) be added to the Tooth Care Pack.

Results

Fifty-one parents provided information about toothbrushing support for their child. Forty-eight parents used a toothbrush, two parents used their finger, and one parent reported that nothing was possible. Forty-six parents reported using toothpaste. Seventeen (33%) parents selected a non-mint toothpaste for their child. Twenty-seven parents (52%) reported brushing their child's teeth twice daily. Twenty-two parents (42%) reported their child was unable to brush any sextant of their mouth independently prior to the study. Twenty-six parents (26%) identified this degree of high support need at the end of the study.

Ten parents requested a call-back at the end of Week 1. Seven parents requested a call-back at the end of Week 2. Fourteen call-back requests (8 SES; 6 DBOH^{Plus}) were to share progress reports or to discuss Tooth Care Pack products. One mother from the DBOH^{Plus} group requested a call-back at the end of Week 1 to voice concern that - "I know what is ideal (2 min twice daily), but it is not possible, and we want to build a good lifelong habit" [5yr]. A second mother from the DBOH^{Plus} group to discuss at the end of Week 2 that her son "cannot

brush for longer than 1 minute" [5yr]. A mother from the SES group requested a call back at the end of Week 1 to ask if she should force her 10-year-old to brush on days he refuses.

The number of parents brushing twice daily in the DBOH^{Plus} group did not change pre- and post-study. The number of parents brushing twice daily in the SES group increased post-study (Figure 1). This change was not statistically significant (chi-squared = 0.33, df = 1, p = 0.56).

Figure 1

Excluding outliers, the mean pre-study daily brushing time was close to 2 minutes i.e half the traditionally recommended 4 minutes (2 minutes twice daily). Post-study there was evidence of increased mean daily toothbrushing time in the SES group and slight decrease in mean toothbrushing time in the DBOH^{Plus} group. Mean toothbrushing time overall was below two minutes twice daily in both groups (Figure 2).

Figure 2

Very high levels of attendance for dental check-ups were reported. All children 10-years and older had been taken for dental checks. Only 9% of children under 10-years had not attended a dental check. Twenty-four per cent of children under 10-years who attended for a dental check could not participate for examination. Ten percent of children 10-years and above could not participate for examination.

Parents provided information about their experience and their child's participation for dental examination.

"*looked in mouth but not examined teeth*" [10yr]

"*took a long time to get him comfy enough to get in seat and kept biting mirror*" [12yr]

"*had a little look in his mouth when he laughed*" [5yr]

"*no exam possible, got so anxious he was trying to be sick.*" [4yr]

"*I thought there would be gas or something special to allow exam when referred to specialist dentist, but I was only asked to hold to help exam which frightened him*" [4yr]

Eighty-four percent of parents with children under 10-years considered that toothbrushing advice provided by the dental team was useful. Forty-five percent of parents with children 10-years and above reported receiving useful toothbrushing advice at dental visits (Figure 3).

Figure 3

Positive behaviour change was reported by parents in both study groups post-study:

"*he is now spending time and has awareness about toothbrushing*" [15yr SES]

"*not full 2 minutes, but gets in mouth and confident gets everywhere*" [9yr SES]

"*starting to brush in mornings*" [7yr SES]

"*full two minutes using timer each time*" [5yr DBOH^{plus}]

"*more keen to brush - different to before project*" [11yr DBOH^{plus}]

"*previously spent a long time trying to brush, now managing to actually get brush in mouth to carry out some brushing*" [5yr DBOH^{plus}]

Parent feedback centred around the need to recognise difference, gain access to information, products and resources, and provide choice (Table 1). Sixteen parents with children of varying age reported finding the Brushbaby KidzSonic® useful. The dinosaur design was popular. Seven parents identified the Oralieve 360 toothbrush, five parents the three headed Dr Barmans, 12 the Oral B Electric, 13 the Collis Curve toothbrush, three the bamboo toothbrush and two a conventional striped handle small headed toothbrush as being useful. Seven parents found timers useful to focus their child's attention on the task duration. Three

parents found the two minute sandtimer useful and four counting down using a digital timer helpful. Two parents found the daily toothbrushing chart a useful incentive for their child. Eleven parents reported knowing about and using flavourless non-foaming oraNurse toothpaste prior to commencing the study. Thirteen additional parents selected use of non-foaming oraNurse toothpaste following the study.

Parental attitudes towards toothbrushing. sugar snacking and dental caries were recorded, in relation to their autistic child, prior to commencing the study workshops. Scores reflect highly positive attitudes towards importance and intention to brush teeth, attitudes to prevention, importance and intention to control child sugar snacking and perceived seriousness of tooth decay in children (Table 2). More moderate scores were recorded in relation to perceived toothbrushing efficacy, controlling sugar snacking and dental decay occurring by chance. Very low scores were reported for external control (preventing decay is the dentist's responsibility).

Discussion

Parents emphasised the importance of recognising difference, access to information, products and resources, and providing choice when developing oral care routines with autistic children and their families (Table 1). No single oral health product provided an immediate solution to oral care challenges. Parents often used different toothbrushes at separate times of the day or on different days depending on their child's participation level. Some parents found non-foaming and unflavoured toothpaste useful, others found their child preferred non-mint foaming toothpaste and others preferred conventional mint toothpaste. Timers and toothbrushing record charts proved to be useful incentives for some autistic children but not for others. Twenty-eight parents found electric or sonic toothbrushes useful which may seem a counter-intuitive recommendation for dental teams concerned about sensory sensitivities for autistic patients.

Call-back request data illustrated two findings. Firstly, parents and children wanted to share achievements in toothbrushing performance. Secondly, when toothbrushing guidance for two minutes twice daily is delivered in a prescriptive manner, parents can feel helpless and guilty when their child is a long way from achieving the guidance delivered. Perceived usefulness of toothbrushing advice from dental care teams is shown in Fig 3. The results suggests that information may be sufficient at an early age, but by 10-years many parents have tried everything and need more than reiteration of routine guidance. This sentiment was communicated by the mother of a 13-year-old girl who shared that "*meeting basic needs like toothbrushing can be a very tricky and ongoing challenge. Families feel helpless and don't know what to do or where to turn. Sometimes families have tried everything and still cannot brush teeth."*

Parental attitudes towards toothbrushing, sugar snacking and dental caries revealed mean scores at or above 4.0 (maximum = 5.0) for importance and intention to brush teeth; attitudes to prevention; importance and intention to control child sugar snacking and perceived seriousness of tooth decay in children. Scores relating to perceived efficacy in relation to toothbrushing, controlling sugar snacking and dental decay occurring by chance were lower (Table 2). Parents appeared not to view preventing decay as the responsibility of the dental team (1.7 (0.9)). This low score for external control may reflect disengagement with oral care teams due to unachievable expectations and advice, or that parents are accustomed to taking responsibility for their autistic child personal care goals. A mother of a 13-year-old boy described how she *"dreamed of a time that her son would be able to dress himself. He can now dress himself, but for toothbrushing I am still heavily involved ... but getting there".*

A strength of the SES guidance appeared to be the "no pressure approach" described by the mother of a 12-year-old boy who highlighted the SES intervention as "*letting him lead*". One parent reported that the "project was helpful to revisit dental health as parent". Data indicating an increase in parental assistance with toothbrushing for all sextants, from 42% of parents to 50% of parents post-study may reflect how participation in the project increased awareness of dental health. There was no change in the number of parents brushing twice daily following the DBOH^{plus} intervention. Although the number of parents brushing twice daily in the SES group increased post-study, this change was not statistically significant. Figure 2 illustrates that very few of the sample parents managed to brush for 4 minutes (2 minutes twice daily) pre- or post-study. There was a small decrease in mean time brushing following the DBOH^{plus} advice workshop and an increase in mean time brushing following the SES advice workshop. The data suggest that the SES guidance and resources may have potential to help parents increase toothbrushing frequency and duration.

Limitations of this study included the statistical power which was insufficient to draw robust conclusions regarding outcome difference between the two study groups. The motivation of the self-selected sample, with 52% of parents reporting brushing twice daily prior to the study, had not been anticipated. Strengthening statistical power in future studies would allow for more robust conclusions. Providing the Tooth Care Pack to both intervention groups was a likely confounding factor. Any future research planned to compare the two guidance types, as study interventions, should consider recruiting families where twice daily toothbrushing is not currently possible and compare the SES guidance to DBOH guidance rather than DBOH^{plus}. A final consideration might be to extend the final time point for feedback beyond 3 weeks post-study. There was evidence from parent feedback of post-study toothbrushing behaviour change. Behaviour change is a slow process. A further data collection time point at 3 to 6 months may provide stronger evidence of toothbrushing behaviour change and parental perceived efficacy.

The study highlighted guilt and perceived isolation experienced by parents when their autistic children struggle to participate with oral hygiene routines. The study also identified a community of autistic patients who remain resistant to toothbrushing despite the provision of guidance, resources and choice. A collaborative approach to oral desensitisation, with specialist speech-language therapists or occupational therapists, is likely to be required for successful behaviour change for these patients.

Conclusion

Providing traditional toothbrushing guidance to families of autistic children may not improve participation with toothbrushing performance, particularly in children 10-years and older. Parents of autistic children value recognition of oral care challenges and provision of information, resources and signposting to oral care products which facilitate choice. Sensory

focused toothbrushing guidance may be more effective in improving toothbrushing performance than prescriptive, traditional guidance for parents of autistic children.

Acknowledgements

This project was supported by funding from the Oral and Dental Research Trust – Colgate Robin Davis Award 2023

Prof Pauline Adair kindly shared the iteration of the Oral Health Behaviour Questionnaire used in the study.

Table 1: Parent views on importance of recognising difference, sharing knowledge and resources, and providing choice

Recognition of Difference	Knowledge and Resources	Importance of Choice
“Special Needs Children - things take longer. 1:1 help is important”	“Never knew that some of the brushes provided existed or that there was flavourless toothpaste. ”	“Big thumbs up! When she is struggling it is useful to have option to try a variety of brushes and toothpastes. ”
“Why should I go if I am going to be told off. I have 2 other children with no decay. I know WHAT to do”	“Amazing being in the project. Googled sensory friendly toothbrushes previously but the brushes in the project never came up”.	“Having a range of toothbrushes to try and timers was a great incentive. He tested each toothbrush for 25 seconds!”
“Normal guidance is not for SEN kids. SEN kids are different and even different from each other”	“Thank you so much for inviting me on to the project, it has been full of information that I never knew”	“Collis curve is proving best. It doesn’t look like a toothbrush - so my child feels "yeah mum I'll put that in my mouth" - no association with toothbrushing”.
“Provide information more than once as sometimes parents are tired due to demands of caring. A lot of times families are operating in survival mode. Sometimes families have tried everything and still cannot brush teeth”	“Very useful to be part of project and knowing these brushes are out there. Dentist should display them and let people know how to get hold of them”	“Having so many toothbrushes to choose from made a big difference. It was like a goodie bag. Son thought 3 headed brush was best thing ever - massive improvement”
“Felt heard and not just you are having problem. No pressure approach, not trying to change his routine. Letting him lead”. [SES group parent]	“Much easier to brush teeth with the 360 toothbrush, so much so that I’ve have bought another for downstairs”	“Finding the right things for autistic child takes effort e.g. you might have to buy 10 toys to find the right toy, then you stick with that - toothbrushes might be similar”

Table 2: Mean scores (standard deviation) for parental attitudes towards toothbrushing. sugar snacking and dental caries for their autistic child (n = 52)

Attitude factor	mean (sd)
Toothbrushing	
Importance and intention to brush child's teeth	4.2 (0.6)
Parental efficacy in relation to toothbrushing	3.8 (0.6)
Attitudes to prevention	4.0 (0.9)
Sugar	
Importance and intention to control child sugar snacking	4.1 (0.5)
Parental efficacy in relation to controlling child sugar snacking	3.4 (0.9)
Dental Caries	
Perceived seriousness of tooth decay in children	4.4 (0.6)
Chance control (decay occurs by chance)	3.8 (0.7)
External control (preventing decay is the dentist's responsibility)	1.7 (0.9)

References

American Psychiatric Association (2013) *Diagnostic and Statistical Manual of Mental Disorders (DSM-5®)*. American Psychiatric Pub.

Bartolomé-Villar B, Mourelle-Martínez MR, Diéguez-Pérez M, de Nova-García MJ. Incidence of oral health in paediatric patients with disabilities: Sensory disorders and autism spectrum disorder. Systematic review II. J Clin Exp Dent. 2016; 8(3): e344-51. doi: 10.4317/jced.52923.

Chauhan A, Leadbitter K, Gray-Burrows KA, Vinall-Collier K, Pickles N, Baker SR, Marshman Z, Day PF. An 'explosion in the mouth': The oral health experiences of autistic children. Autism. 2025; 29(3): 627-641. doi: 10.1177/13623613241288628.

Creeth JE, Gallagher A, Sowinski J, Bowman J, Barrett K, Lowe S, Patel K, Bosma ML. The effect of brushing time and dentifrice on dental plaque removal in vivo. J Dent Hyg. 2009; 83(3):111-6. PMID: 19723429.

Du RY, Yiu CKY, King NM. Oral Health Behaviours of Preschool Children with Autism Spectrum Disorders and Their Barriers to Dental Care. J Autism Dev Disord. 2019 ; 49(2): 453-459. doi: 10.1007/s10803-018-3708-5.

Erwin J, Paisi M, Neill S, Burns L, Vassallo I, Nelder A, Facenfield J, Devalia U, Vassallo T, Witton R. Factors influencing oral health behaviours, access and delivery of dental care for autistic children and adolescents: A mixed-methods systematic review. Health Expect. 2022; 25(4): 1269-1318. doi: 10.1111/hex.13544.

Fereday J, Muir-Cochrane E. Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. Int J Qual Methods, 2006; 5(1): 80-92. DOI: 10.1177/160940690600500107.

NHS 2019. The NHS long term plan [Online]. Available at: https://webarchive.nationalarchives.gov.uk/ukgwa/20230418155402/https:/www.longtermplan.nhs.uk/publication/nhs-long-term-plan [Accessed: 23 August 2025].

NHS 2023. Clinical Standard – Oral Healthcare for Autistic Children and Young People and/or Those with a Learning Disability in Special Educational Settings [Online]. Available at: https://www.england.nhs.uk/publication/clinical-standard-oral-healthcare-for-autistic-children-and-young-people-and-or-those-with-a-learning-disability [Accessed 23 Aug 2025] Strategy guidance: https://www.england.nhs.uk/wp-content/uploads/2023/10/PAR1514-resistance-poster.pdf

Parry JA, Newton T, Linehan C, Ryan C. Dental Visits for Autistic Children: A Qualitative Focus Group Study of Parental Perceptions. JDR Clin Trans Res. 2021; 8(1): 36-47. doi: 10.1177/23800844211049404.

Public Health England 2021. Delivering better oral health: an evidence-based toolkit for prevention [Online]. Available at: https://www.gov.uk/government/publications/delivering-better-oral-health-an-evidence-based-toolkit-for-prevention [accessed 28 September 2021].

Stein LI, Polido JC, Cermak SA. Oral care and sensory concerns in autism. Am J Occup Ther. 2012; 66(5): 73-6. doi: 10.5014/ajot.2012.004085.

Swain J. 2018. A Hybrid Approach to Thematic Analysis in Qualitative Research: Using a Practical Example. Sage Research Methods Cases Part 2 SAGE Publications [Online]. Available at: https://doi.org/10.4135/9781526435477 [Accessed 24 Aug 2025].

Trubey RJ, Moore SC, Chestnutt IG. Parental decisions about children's oral health behaviour: relative or absolute? Community Dent Oral Epidemiol. 2017; 45(1): 35-42. doi: 10.1111/cdoe.12256.

Zhou N, Wong HM, McGrath C. Efficacy of Social Story Intervention in Training Toothbrushing Skills Among Special-Care Children With and Without Autism. Autism Res. 2020; 13(4): 666-674. doi: 10.1002/aur.2256.

Figure 1: Proportion of children participating in twice daily toothbrushing before and after study workshops

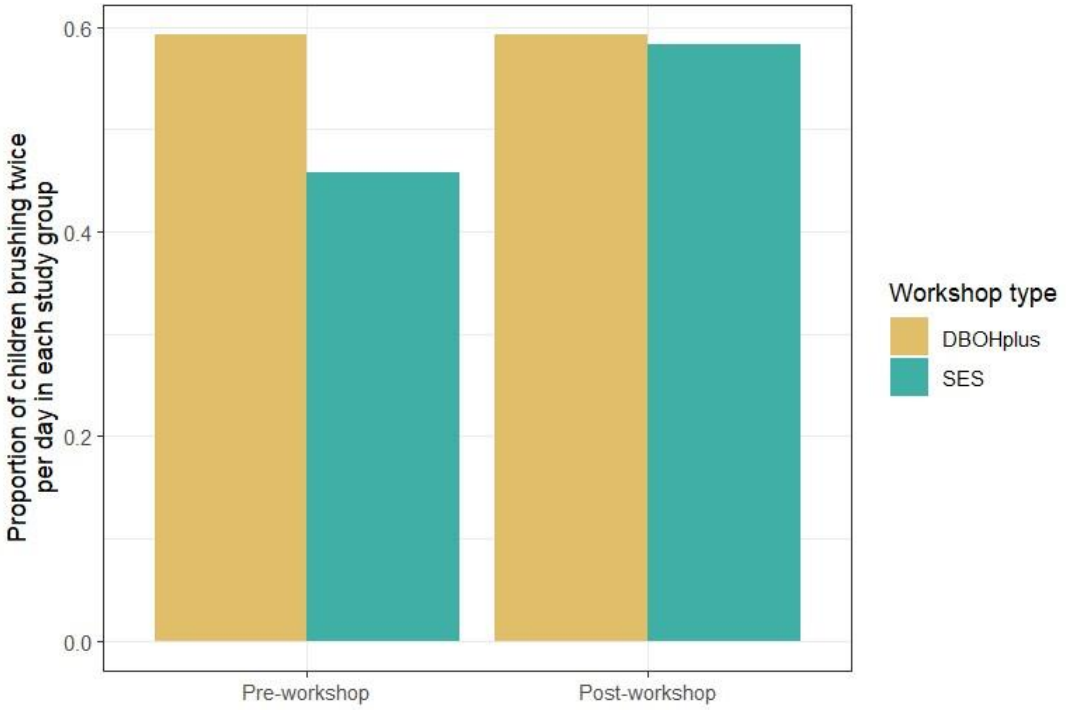


Figure 2: Density plot showing mean brushing time (minutes) before and after study workshops

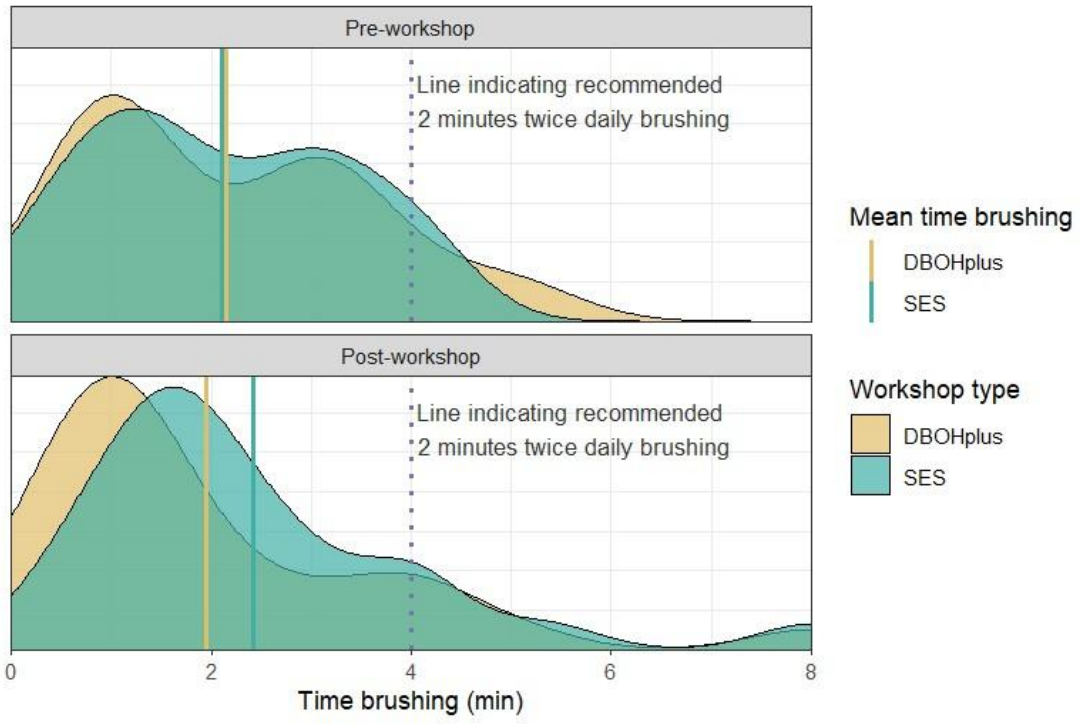
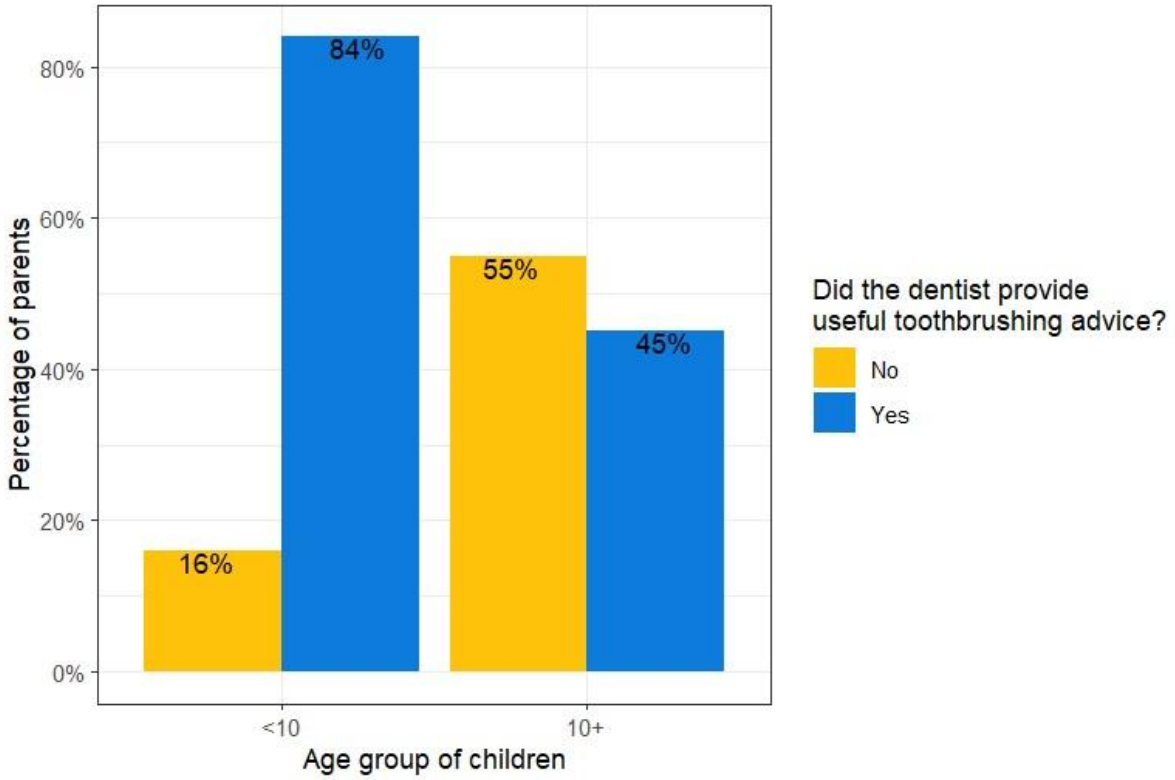


Figure 3: Parental report of usefulness of toothbrushing advice provided at dental visits



SUPPLEMENTARY MATERIAL 1:

Pre-intervention experience and attitudes questionnaire

General Information	Parent name Postcode Contact number Child's age Child's sex: male ☐ female ☐ prefer not to say ☐ Is your family entitled to free school meals? Yes ☐ No ☐ prefer not to say ☐
Which health / educational challenges does you child experience?	Autism ☐ Complex / multiple LD ☐ Physical Disabilities ☐ Sensory impairment ☐ Other ☐ If other, please state:
Questions are about study child:	Have you ever taken your child to a dentist? Yes ☐ No ☐ If yes, did the dentist examine your child's teeth? Yes ☐ No ☐ If yes, did the dentist provide useful toothbrushing advice? Yes ☐ No ☐
	Has your child ever had toothache in the last year? Yes ☐ No ☐ **If yes, how often?** once ☐ twice ☐ three times ☐ more ☐
	Can you tell if your child has pain e.g. toothache? Yes ☐ No ☐ explain

experience and attitudes questionnaire

These statements examine your feelings and attitudes towards tooth decay, controlling sugar in your family diet and toothbrushing your child's teeth. Please tick one box on each line.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Tooth decay will not get better by itself.	1	2	3	4	5
The people in my family would feel it was important to help brush my child's teeth twice a day.	1	2	3	4	5
Tooth decay would have major consequences on my child's general health.	1	2	3	4	5
I don´t have time to help brush my child´s teeth twice a day.	1	2	3	4	5
The people in my family would feel it was important to control how often my child has sugary foods and drinks between meals.	1	2	3	4	5
My child losing a tooth due to tooth decay would be upsetting.	1	2	3	4	5
It is worthwhile to give my child sweets/biscuits to behave well.	1	2	3	4	5
If my child does not want to brush his/her teeth every day I don't feel I should make him/her.	1	2	3	4	5
No matter what I do, my child is likely to get tooth decay.	1	2	3	4	5

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I can prevent tooth decay in our child by reducing sugary foods and drinks between meals.	1	2	3	4	5
It is just bad luck if my child gets tooth decay.	1	2	3	4	5
As a parent/caregiver I intend to brush my child's teeth for him/her.	1	2	3	4	5
Tooth decay runs in families.	1	2	3	4	5
Tooth decay is a serious problem in children's teeth.	1	2	3	4	5
I don't know how to brush my child's teeth properly.	1	2	3	4	5
If I brush My child's teeth twice a day, I can prevent my child getting tooth decay in the future.	1	2	3	4	5
If my child gets tooth decay, it is by chance.	1	2	3	4	5
It is often too stressful to say no to my child when they want sweets.	1	2	3	4	5
As a parent/caregiver, it is my responsibility to prevent my child getting tooth decay.	1	2	3	4	5
I cannot make our child brush his/her teeth twice a day.	1	2	3	4	5

experience and attitudes questionnaire

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Some people just naturally have soft teeth.	1	2	3	4	5
I intend controlling how often our child has sugary foods or drinks between meals.	1	2	3	4	5
As a family, I feel it is difficult for us to stop our child having sugary foods and drinks between meals.	1	2	3	4	5
I feel it is important to check *if* my child has brushed his/her teeth.	1	2	3	4	5
I intend to brush my child's teeth for him/her twice a day.	1	2	3	4	5
The people I know well would feel it was important to control how often my child has sugary foods and drinks.	1	2	3	4	5
In our family, it would be unfair not to give sweets to my child every day.	1	2	3	4	5
I feel it is important that I check my child's teeth for decay.	1	2	3	4	5
It is not worth it to battle with my child to brush his/her teeth twice a day.	1	2	3	4	5
Regular visits to the dentist would be effective in stopping our child having tooth decay.	1	2	3	4	5

SUPPLEMENTARY MATERIAL 2: Content of tooth care pack

Toothbrushes

Small headed bamboo toothbrush

Three headed super brush Dr Barmans

Oralieve 360 Toothbrush

Collis Curve toothbrush

Basic small headed striped toothbrush

Oral B Electric Toothbrush

Brushbaby KidzSonic®

Toothpastes

oraNurse Sodium lauryl sulphate free non foaming toothpaste. No flavour.

Sanderson Ohp Family Toothpaste - very mild mint flavoured toothpaste

Timers

Sand Timer

Digital kitchen timer

Mouth Prop

Open wide mouth prop