Beneficial effects of supervised toothbrushing on caries incidence in children and adolescents are questioned

Abstracted from

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A systematic review of the effects of supervised toothbrushing on caries incidence in children and adolescents. *Int J Paediatr Dent* 2018; **28:** 3-11. doi:10.1111/ipd.12334. [Epub ahead of print] Review. PubMed PMID: 28940755.

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Question: Does supervised toothbrushing reduce the incidence of caries in children and adolescents?

Data sources The Cochrane Central Register of Controlled Trials, Medline via PubMed, Web of Science, Embase, LILACS and BBO. Sources of grey literature included Open Grey, EThOS and Banco de Teses CAPES. Two international registers of ongoing trials were also searched (Current Controlled Trials and ClinicalTrials.gov). There were no language or date restrictions.

Study selection No information is given in the manuscript or the published protocol on how the study selection was carried out, although the authors state that they followed PRISMA guidelines.

Data extraction and synthesis Data extraction and risk of bias assessment were carried out independently by two reviewers.

Results Four studies were included; in all trials, supervised toothbrushing took place in schools. However, they differed in participant ages and caries risk as well as toothpaste fluoride concentration. Outcomes and outcome measures also varied. Two trials reported statistically significant differences in favour of supervised toothbrushing but lacked data on effect size and precision. No meta-analyses were carried out because of the high degree of heterogeneity between the studies.

Conclusions The lack of high quality evidence meant that this systematic review was unable to reach a definitive conclusion on the effectiveness of supervised toothbrushing programmes on caries incidence in children and adolescents.

Commentary

Dentists and dental hygienists worldwide are faced daily with decisions on how best to control carious lesions in young patients. There is sufficient evidence supporting the daily use of fluoride toothpaste (>1000ppmF) to reduce the incidence and severity of caries in children and adolescents.[1] In addition, in order to maximise the effect of fluoride toothpastes, supervised brushing has been encouraged. However, the role of supervised toothbrushing in caries control is still not clearly proven on high level evidence.

The purpose of this current review was to assess the evidence on the effects of supervised toothbrushing in reducing caries at the dentin level in children and adolescents as measured by any caries index. For this purpose, a comprehensive search of electronic bibliographic databases, as well as hand searching of relevant dental journals was performed. There were no restrictions on language or date of publication. In addition, authors were contacted for missing or unclear information. The search and data extraction methods followed the standard methods and are consequently sound.

The authors have chosen to include randomised and quasi-randomised controlled trials comparing supervised toothbrushing to a group that did not receive supervised brushing (control arm) with a follow-up period of at least one year. Accordingly, only four of the 112 full-text articles assessed for eligibility were included.

All the studies were carried out at school based settings, though there was wide variation in the studies' design (population age, toothpaste fluoride concentration, outcome criteria, interventions to follow-up, etc), and methodology used (data collection, reported results), with confounding factors not being controlled for in the majority of studies. In addition, in most of the studies there were no sample size calculations, nor was population representative sampling performed, in fact, all of the studies were carried out in schools, probably with 'convenience sampling'.

The risk of bias was assessed using the Cochrane tool. Due to the marked heterogeneity of studies' design and outcomes, a meta-analysis was not carried out, instead the review outcomes are presented as a narrative systematic review. However, neither the total number of children included in the studies nor age distribution were reported. Furthermore, there is no mention of whether or not a baseline caries risk assessment was uniformly performed, in order to assess selection bias.

The clear heterogeneity of studies was also reflected in their outcomes, with no agreement on the effect of supervised brushing.

It was disappointing to observe that none of the four included studies in this review were considered to have low risk of bias. The main drawbacks presented by the authors were methodological flaws or poor results reporting, which raises some doubt about the presented results.

In summary, there is still not sufficient evidence of a high level to indicate that school based supervised brushing has an effect on caries incidence. Still, this does not mean that these programmes would be ineffective. Future studies with a high quality level should include baseline caries risk assessments, use calibrated, internationally accepted caries criteria, which include initial lesions to allow quantitative data synthesis. Reviews like the present one offer a comprehensive overview of current related evidence, but often do not allow any relevant conclusion. Thus, they show the need to improve the quality of research in order to clarify the effect of supervised toothbrushing on the caries incidence in children and adolescents.

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1. Marinho VC, Higgins JP, Sheiham A, Logan S. Fluoride toothpastes for preventing dental caries in children and adolescents. *Cochrane Database Syst Rev* 2003; **1:** Art. No.: CD002278. DOI: 10.1002/14651858.CD002278

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