February 2017 – SUPPORT Summary of a systematic review

Do midlevel dental providers improve oral health?

Access to dental care and dentists is difficult around the world, particularly in low-income countries. Consequently, many nations have employed alternative non-dentist midlevel providers to conduct diagnostic, treatment planning, or irreversible surgical dental procedures.

Key messages

- **It is uncertain whether midlevel providers decrease the incidence, prevalence, or severity of dental caries, or increase treatment of caries.**
- **None of the included studies was conducted in a low-income country.**

Who is this summary for?

People deciding whether to introduce dental auxiliaries into practice

This summary includes:

- **Key findings** from research based on a systematic review
- **Considerations about the relevance of this research** for low-income countries

Not included:

- Recommendations
- Additional evidence not included in the systematic review
- Detailed descriptions of interventions or their implementation

This summary is based on the following systematic review:

Wright JT, Graham F, Hayes C, et al. A systematic review of oral health outcomes produced by dental teams incorporating midlevel providers. J Am Dent Assoc 2013; 144:75-91.

What is a systematic review?

A summary of studies addressing a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise the relevant research, and to collect and analyse data from the included studies

SUPPORT was an international project to support the use of policy relevant reviews and trials to inform decisions about maternal and child health in low- and middle-income countries, funded by the European Commission (FP6) and the Canadian Institutes of Health Research.

Glossary of terms used in this report: www.supportsummaries.org/glossary-of-terms

Background references on this topic: See back page

Background

Dental caries are the most common chronic disease in children and adults. In low-income countries they disproportionately affect those of lower socioeconomic status. It is precisely in these countries where access to dental care and dentists is more limited. As training of dentists is long and expensive, alternative oral healthcare providers have been developed. They perform some of the reversible and irreversible procedures traditionally performed by dentists. Both the names (dental assistant, dental auxiliary, dental nurse, dental hygienist, dental technician, dental therapist) and the range of duties they perform vary widely from country to country. They are often referred to as professions complementary to dentistry or midlevel providers.

How this summary was prepared

After searching widely for systematic reviews that can help inform decisions about health systems, we have selected ones that provide information that is relevant to low-income countries. The methods used to assess the reliability of the review and to make judgements about its relevance are described here: www.supportsummaries.org/how-support-summaries-are-prepared/

Knowing what's not known is important

A reliable review might not find any studies from low-income countries or might not find any well-designed studies. Although that is disappointing, it is important to know what is not known as well as what is known.

A lack of evidence does not mean a lack of effects. It means the effects are uncertain. When there is a lack of evidence, consideration should be given to monitoring and evaluating the effects of the intervention, if it is used.

About the systematic review underlying this summary

Review objective: To determine the effect of a model of provision of dental care that utilizes midlevel providers compared to no care or care by dentists

Types of	What the review authors searched for	What the review authors found
Study designs & Interventions	Experimental, observational and descriptive studies evaluating the provision of irreversible and surgical procedures by midlevel providers	18 retrospective or cross-sectional studies
Participants	People of any age	School children (15), Indian communities (2), military servicemen (1)
Settings	Urban or rural	The studies were conducted in Australia (6), Canada (3), Hong Kong (3), New Zealand (5) and the United States (3).
Outcomes	Dental disease incidence, prevalence, or severity; untreated disease; and cost-effectiveness	Caries, diagnostic procedures, treatment planning, irreversible or surgical procedures

Date of most recent search: February 2012

Limitations: This is a well-conducted systematic review with only minor limitations.

Wright JT, Graham F, Hayes C, et al. A systematic review of oral health outcomes produced by dental teams incorporating midlevel providers. J Am Dent Assoc 2013; 144:75-91.

Summary of findings

Eighteen studies were included, involving 6042 participants, receiving irreversible dental treatment from teams that included midlevel providers.

Seven studies reporting caries outcomes showed a consistent trend of reduction in caries severity across time. Twelve studies that compared populations treated by dental therapists with private dental care or no care had inconsistent results.

Five studies reporting on untreated caries found a consistent trend of reduction in caries severity over time. Thirteen studies comparing populations treated by dental therapists with private dental care or no care found inconsistent results.

➔ **It is uncertain whether midlevel providers decrease the incidence, prevalence, or severity of dental caries, or untreated caries. The certainty of this evidence is very low.**

About the certainty of the evidence (GRADE) *

⊕⊕⊕⊕
High: This research provides a very good indication of the likely effect. The likelihood that the effect will be substantially different† is low.

⊕⊕⊕◯
Moderate: This research provides a good indication of the likely effect. The likelihood that the effect will be substantially different† is moderate.

⊕⊕◯◯
Low: This research provides some indication of the likely effect. However, the likelihood that it will be substantially different† is high.

⊕◯◯◯
Very low: This research does not provide a reliable indication of the likely effect. The likelihood that the effect will be substantially different† is very high.

* This is sometimes referred to as 'quality of evidence' or 'confidence in the estimate'.

† Substantially different = a large enough difference that it might affect a decision

See last page for more information.

Dental care by midlevel providers

People Children from 9 to 16 years that received irreversible dental treatment
Settings Mostly schools in urban or rural areas
Intervention Dental care by midlevel providers (dental therapists or school dental service known to employ dental therapists)
Comparison Private dental care by dentists or not having received care recently

Outcomes	**Impact**	Certainty of the evidence (GRADE)	Comments
Caries severity scores across time	Reductions from 6% to 79%	⊕◯◯◯ Very low	Based on data from 7 uncontrolled before-after studies
Caries increment and severity scores	Reductions of 27% to increments of 38% compared to dentists and reductions from 0% to 21% compared to no dental care	⊕◯◯◯ Very low	Based on data from 9 observational studies with private care by dentists as the comparison and 3 studies with no dental care as the comparison
Mean levels of untreated caries across time	Reductions from 17% to 79%	⊕◯◯◯ Very low	Based on data from 5 uncontrolled before-after studies
Mean levels of untreated caries	From reductions of 78% to increments of 70% compared to dentists and reductions from 1% to 83% compared to no dental care	⊕◯◯◯ Very low	Based on data from 10 observational studies with private care by dentists as the comparison and 3 studies with no dental care as the comparison

GRADE: GRADE Working Group grades of evidence (see above and last page)

Relevance of the review for low-income countries

➔ Findings	▷ Interpretation*
APPLICABILITY	
➔ **Most studies evaluated school children from urban or rural areas in high-income countries.**	▷ *The provision of oral healthcare requires a complicated infrastructure, including appropriate supervision, dental offices, and a financing system. Therefore, the findings may not be directly applicable to low-income countries.*
EQUITY	
➔ **Few studies included disadvantaged populations and populations without dental care.**	▷ *The benefits of dental care by midlevel providers are potentially larger and more consistent for underserved populations, and therefore could reduce inequities.*
ECONOMIC CONSIDERATIONS	
➔ **The systematic review did not address economic considerations.**	▷ *Scaling up midlevel providers requires resources, but probably less resources than scaling up dental care by dentists.*
MONITORING & EVALUATION	
➔ **Good quality data from experimental studies is lacking.**	▷ *New workforce models incorporating midlevel providers should be launched with robust evaluation plans. Ideally cluster randomised trials or quasi-experimental studies should be used to determine the effectiveness and cost-effectiveness of these interventions. In addition to health outcomes, intermediate outcomes (such as wait times, travel distance, and retention of personnel who are trained and employed) should be measured.*

*Judgements made by the authors of this summary, not necessarily those of the review authors, based on the findings of the review and consultation with researchers and policymakers in low-income countries. For additional details about how these judgements were made see: www.supportsummaries.org/methods

Additional information

Related literature

Rodriguez TE, Galka AL, Lacy ES, et al. Can midlevel dental providers be a benefit to the American public? J Health Care Poor Underserved 2013; 24:892-906.

Phillips E, Shaefer HL. Dental therapists: evidence of technical competence. J Dent Res 2013; 92(7 Suppl):11S-5S.

Nash DA, Friedman JW, Mathu-Muju KR, et al. A Review of the global literature on dental therapists: In the context of the movement to add dental therapists to the oral health workforce in the United States. Oral Health Science Faculty Publications. 7. 2014. http://uknowledge.uky.edu/cgi/viewcontent.cgi?article=1009&context=ohs_facpub

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Conflict of interest

None declared. For details, see: www.supportsummaries.org/coi

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This review should be cited as

Wright JT, Graham F, Hayes C, et al. A systematic review of oral health outcomes produced by dental teams incorporating midlevel providers. J Am Dent Assoc 2013; 144:75-91.

The summary should be cited as

Ciapponi A. Do midlevel dental providers improve oral health? A SUPPORT Summary of a systematic review. February 2017. www.supportsummaries.org

About certainty of the evidence (GRADE)

The "certainty of the evidence" is an assessment of how good an indication the research provides of the likely effect; i.e. the likelihood that the effect will be substantially different from what the research found. By "substantially different" we mean a large enough difference that it might affect a decision. These judgements are made using the GRADE system, and are provided for each outcome. The judgements are based on the study design (randomised trials versus observational studies), factors that reduce the certainty (risk of bias, inconsistency, indirectness, imprecision, and publication bias) and factors that increase the certainty (a large effect, a dose response relationship, and plausible confounding). For each outcome, the certainty of the evidence is rated as high, moderate, low or very low using the definitions on page 3.

For more information about GRADE:
www.supportsummaries.org/grade

SUPPORT collaborators:

The Cochrane Effective Practice and Organisation of Care Group (EPOC) is part of the Cochrane Collaboration. The Norwegian EPOC satellite supports the production of Cochrane reviews relevant to health systems in low- and middle-income countries . www.epocoslo.cochrane.org

The Evidence-Informed Policy Network (EVIPNet) is an initiative to promote the use of health research in policymaking in low- and middle-income countries. www.evipnet.org

The Alliance for Health Policy and Systems Research (HPSR) is an international collaboration that promotes the generation and use of health policy and systems research in low- and middle-income countries. www.who.int/alliance-hpsr

Norad, the Norwegian Agency for Development Cooperation, supports the Norwegian EPOC satellite and the production of SUPPORT Summaries. www.norad.no

The Effective Health Care Research Consortium is an international partnership that prepares Cochrane reviews relevant to low-income countries. www.evidence4health.org

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