Oral Health Education programs for oral health of visually impaired individuals: meta-evaluation of systematic reviews and meta-analysis

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AIM

To exemplify, summarize and critically appraise the systematic reviews (SRs) that have evaluated different Oral Health Education (OHE) interventions in individuals with visual impairment (VI) and compare the outcomes across the SRs.

METHODOLOGY

Protocol and registration: International Prospective Register of Systematic Reviews (Record ID: CRD42022377147).

Eligibility criteria: SRs that summarized different OHE methods (Interventions) with sham or control or other OHE methods (Control) in individuals with VI (Population) to evaluate change in oral soft tissue or hard tissue parameters.

Data search: Cochrane database for systematic reviews, Embase, Joanna Briggs Institute EBP (evidence-based practice) database, Medline, PubMed, Scopus and Web of Science. Additionally, reference lists of the included systematic reviews and the primary studies included and first 10 pages of Google scholar.

Risk of Bias of included systematic reviews: Assessing the Methodological Quality of Systematic Reviews-2 (AMSTAR-2) tool

Analysis of degree of overlap: Generating citation matrix and calculating *"Corrected Covered Area"*.

RESULTS

Selection of systematic reviews: Seven SRs were included. Cohen's kappa value: 0.847 (strong agreement)

Characteristics of the included reviews: Two SRs pooled results quantitatively (meta-analysis), whereas five did qualitative analysis. Three reviews were published from India, one each from Brazil, Indonesia, Netherlands and New Zealand. The included SRs evaluated a variety of OHE methods for VI individuals that had the use of Braille, tactile or audio sensation (in the form of plastic tooth models or stories or computer software like JAWS®: Job Access With Speech) or any combination thereof.

Analysis of degree of overlap: The seven SRs included in this meta-evaluation summarized the evidence overall from 30 exclusive primary studies and had a range from 5 to 24 of these studies included in them. Despite the slightly different eligibility criteria, the degree of overlap was calculated to be 26% which can be interpreted as very high overlap as the reviews tended to include the same studies.

*Risk of Bias of included systematic reviews **(Figure 1)**:* The most common problematic item with the included reviews pertained to Item 3 (explanation of the selection of study designs in their review), followed by Item 4 (comprehensive literature search) and then Item 2 (registration of protocol or establishing a protocol before conducting the review). Overall, none of the included SRs had a final rating of high confidence in the findings, whereas one could attain moderate confidence, and the remaining six had critically low confidence in the results.

CONCLUSIONS

The meta-evaluation and synthesis of the results from the SRs conclude that the combination of more than one OHE method might be better in improving oral hygiene in individuals with visual impairment. The included SRs summarized the following methods of OHE: Braille, tactile methods, audio methods, software or combination of those. However, the evidence of OHE in improving the outcomes related to dental trauma or dental caries is inconclusive and lacking due to the lack of primary studies. Furthermore, most of the oral health clinical research and program evaluations appear to come from limited parts of the world and data from most parts of the world is lacking *(Figure 2)*. Thus, future studies in understudied countries could harness information from the available OHE programs to improve the oral health status of individuals with visual impairment.

Abbreviations: *AMSTAR- Assessing the Methodological Quality of Systematic Reviews; EBP-Evidence-based Practice; JAWS®- Job Access With Speech oral Health Education; SR- Systematic Review; VI-Visual Impairment*
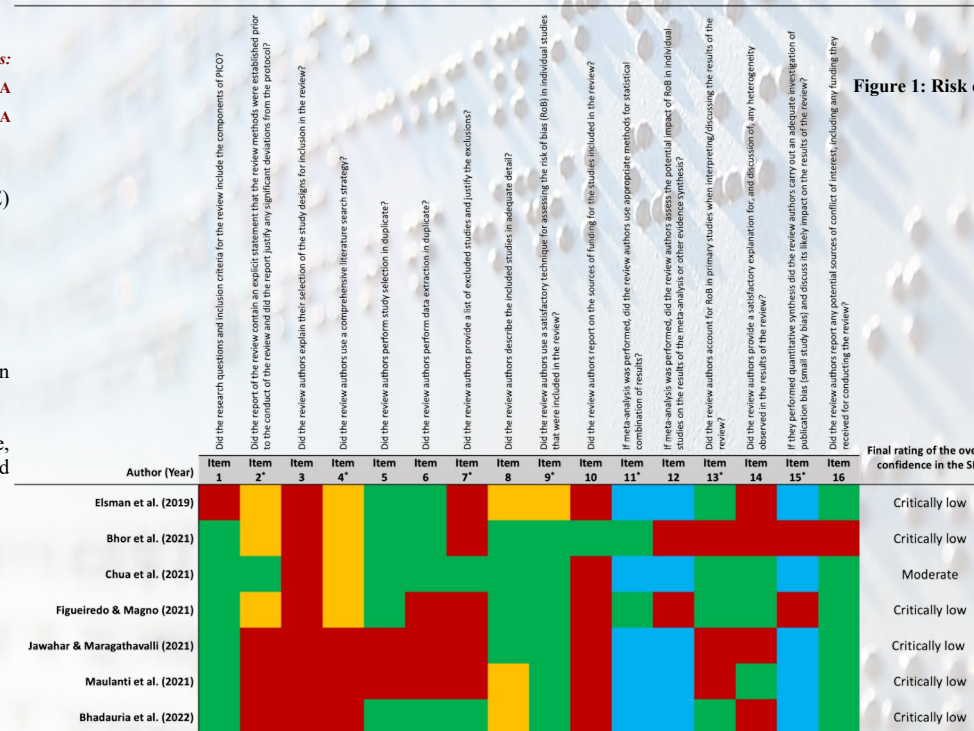

Figure 1: Risk of bias assessment of included reviews using AMSTAR-2 tool

Key
Yes
Probably yes
No
Not applicable

Figure 2: Global map of SRs and primary studies evaluating OHE in VI individuals.

BULGARIA
Doichinova et al., 2019

INDIA
Hebbal & Ankola, 2012
Shetty et al., 2013
Arunakul et al., 2015
Ganapathi et al., 2015
Mahantesha et al., 2015
Bhor et al., 2016
Chowdary et al., 2016
Krishnakumar et al., 2016
Debnath et al., 2017
Deshpande et al., 2017
Gautam et al., 2018a
Gautam et al., 2018b
Tavargeri A, 2018
Vyas et al., 2018
Agarwal S, 2019
Aggarwal et al., 2019
Das et al., 2019
Khurana et al., 2019
Sardana et al., 2019
Tiwari et al., 2019
Sriram, 2020

NETHERLANDS

TURKEY
Yalcinkaya & Atalay, 2006

IRAN
Sharififard et al., 2020

PAKISTAN
Qureshi et al., 2017

INDONESIA
Suharsini et al., 2017
Alamsyah & Natassa, 2018

MALAYSIA
Shahabudin S, 2016

THAILAND
Smutkeeree et al., 2011
Arunakul et al., 2015

BRAZIL

INDONESIA

NEW ZEALAND

*The bubbles represent SRs with the numbers inside indicating the number of primary studies included by that review.

References

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