

Can Motivational Interviewing be used in caries prevention in preschoolers? An integrative review

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Abstract: to perform an integrative review based on a clinical question: "Can motivational interviewing (MI) be used to prevent dental caries in preschool children?". **Materials and methods:** an integrative literature review was conducted in April 2021 using an adaptation of the "6S System". We also evaluated the quality of the systematic reviews (SR) found through two tools for methodological assessment. Evidence-Based Dentistry, Journal of Evidence-Based Dental Practice and on the website of the Center for Evidence-Based Dentistry of the American Dental Association. SRs were searched in the Cochrane Library and PubMed/Medline databases. The selected search words were "motivational interviewing" and "dental caries". **Results:** the final search resulted in 2 SR on the topic. One SR from 2020 showed a reduction in dental caries through meta-analysis, but with no statistically significant difference; the authors point out that the limited evidence is due to the presence of heterogeneous studies based on different methodologies. Another SR from 2021 concluded that MI has the potential to modify behavior and significantly reduce carious lesions, mainly in children with high caries experience. The methodological quality of the SR included in this review was also assessed using the PRISMA and AMSTAR-2 protocols. Both showed high quality and low risk of bias. **Conclusion:** the practice of MI contributes to the prevention of dental caries in preschoolers, especially in high-risk children. However, the evidence is moderate, obtained from poor meta-analyses and a limited number of randomized studies of good methodological quality.

Key words: Motivational Interviewing, Dental Caries, Child, Preschoolers, Evidence-Based Dentistry.

¿La Entrevista Motivacional puede ser utilizada en la prevención de las caries en preescolares? Una revisión integradora

Resumen: El objetivo fue realizar una revisión a partir de una duda clínica: "¿La práctica de la entrevista motivacional (EM) puede ser utilizada en la prevención de las caries en preescolares?" **Materiales y métodos:** se realizó una revisión integradora de la literatura en abril de 2021 utilizándose una adaptación del "Sistema 6S". Se evaluó la calidad de las revisiones sistemáticas (RS). Fueron realizadas búsquedas en los periódicos *Evidence-Based Dentistry*, *Journal of Evidence-Based Dental Practice* y en el sitio del Centro de Odontología Basada en Evidencias de American Dental Association, Biblioteca Cochrane y PubMed/Medline. Las palabras para la búsqueda fueron "motivational interviewing" y "dental caries". **Resultados:** resultó en 2 RS sobre el tema. Una RS de 2020 mostró reducción de caries a través del meta-análisis, pero sin diferencia estadísticamente significativa; los autores destacan que las evidencias limitadas se deben a la presencia de estudios heterogéneos basados en diferentes metodologías. Otra RS de 2021 concluyó que la EM posee el potencial de modificar el comportamiento y reducir significativamente lesiones cariosas principalmente en niños con elevada experiencia de caries. Fue también evaluada la calidad metodológica de las RS incluidas en esta revisión a través de los protocolos PRISMA y AMSTAR-2. Ambas presentaron bajo riesgo de sesgo y alta calidad. **Conclusión:** la práctica de la EM contribuyó en la prevención de la caries en preescolares, principalmente en los niños de alto riesgo. Sin embargo, las evidencias son moderadas, obtenidas a partir de meta-análisis poco robustos y de un número limitado de estudios aleatorios de buena calidad metodológica.

Palabras clave: Entrevista Motivacional, Caries Dental, Niños, Preescolar, Odontología Basada en Evidencia.

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A Entrevista Motivacional pode ser utilizada na prevenção da cárie em pré-escolares? Uma revisão integrativa

Resumo: Objetivou-se realizar uma revisão integrativa a partir de uma dúvida clínica: “A prática da entrevista motivacional (EM) pode ser utilizada na prevenção da cárie dentária em pré-escolares?”. **Materiais e métodos:** foi realizada uma revisão integrativa da literatura em abril de 2021 utilizando-se uma adaptação do “Sistema 6S”. Avaliou-se a qualidade das revisões sistemáticas (RS) encontradas através de duas ferramentas para avaliação metodológica. Foram realizadas buscas nos periódicos Evidence-Based Dentistry, Journal of Evidence-Based Dental Practice e no site do Centro de Odontologia Baseada em Evidências da American Dental Association. Buscou-se RS nas bases da Biblioteca Cochrane e PubMed/Medline. As palavras selecionadas para as buscas foram “*motivational interviewing*” e “*dental caries*”. **Resultados:** a busca final resultou em 2 RS sobre o tema. Uma RS de 2020 mostrou redução de cárie através da meta-análise, porém sem diferença estatisticamente significativa; os autores destacam que as evidências limitadas se devem a presença de estudos heterogêneos baseados em diferentes metodologias. Outra RS de 2021 concluiu que a EM possui o potencial de modificar o comportamento e reduzir significativamente lesões cáries principalmente em crianças com elevada experiência de cárie. Foi ainda avaliada a qualidade metodológica das RS incluídas nesta revisão através dos protocolos PRISMA e AMSTAR-2. Ambas apresentaram baixo risco de viés e alta qualidade. **Conclusão:** a prática da EM contribui na prevenção da cárie em pré-escolares, principalmente nas crianças de alto risco. Entretanto, as evidências são moderadas, obtidas a partir de meta-análises pouco robustas e de um número limitado de estudos randomizados de boa qualidade metodológica.

Palavras-chave: Entrevista Motivacional, Cárie Dentária, Criança, Pré-Escolar, Odontologia Baseada em Evidência.

Introduction

Early childhood dental caries remains very prevalent in many countries, and the vast majority of affected children have no access to dental treatment.¹ Untreated carious lesions negatively affect the quality of life of the child and his or her family², and their consequences generate high costs to society. Dependent on high sugar consumption, dental caries shares common behavioral risks with other multifactorial and non-communicable diseases such as obesity, diabetes, and cardiovascular diseases, and seems to be influenced by social context and family habits.³ Strategies have been recently discussed aiming to control early childhood dental caries in Latin America and Caribbean countries based on sugar consumption restriction, fluoride use, and sealant application.⁴

Abandoning an unhealthy lifestyle is a complex challenge that requires

sustained changes in an individual's behavior.⁵ Motivational Interviewing (MI) is a behavioral approach that seeks to intervene in an individual's lifestyle, promoting a behavioral change beneficial to health through intrinsic motivation⁶, and it has been widely used to assist treatments for patients who use illicit drugs⁷, alcohol and tobacco⁸, are obese⁹, and have chronic systemic diseases¹⁰, as well as periodontal disease.¹¹

The American Association of Pediatric Dentistry periodically reviews its open access clinical protocols, and MI continues to be recommended as a communication strategy to be used in order to motivate children and their caregivers to change their behavior.¹² However, in Brazil, this approach seems to be poorly diffused in undergraduate dental courses¹³ and little known among dentists and students¹⁴; however, it has learning potential for health care students.¹⁵

With so many studies being published daily, it has become difficult for clinicians to keep up to date and select reliable publications on which to base their daily practice. From an adaptation of the 6S System¹⁶ used in medicine, dental surgeons can search for the best scientific evidence available to solve questions in clinical practice in a simple and quick way.¹⁷ Through this strategy, an answer was sought to the following question: "Can motivational interviewing be used to prevent dental caries in preschool children?" This integrative review aimed to describe the step-by-step approach to resolve the clinical question described above, and also sought to critically evaluate the studies found.

Materials and methods

Clinical doubt and search strategy used

Based on an adaptation of the 6S System, a system that classifies sources of scientific evidence for clinical practice into six categories, a search was performed for the question: "Can motivational interviewing be used to prevent dental caries in preschool children?" The question was designed following the PICO format (Population, Intervention, Comparator and Outcome). We considered preschool children as the population, the intervention was the practice of MI, and the outcome was a reduction in the risk of developing new carious lesions.

P= preschool children;

I= MI approach;

C= conventional approach/standard treatment

O= dental caries reduction.

According to the strategy used, the journals Evidence-Based Dentistry, Journal of Evidence-Based Dental Practice, and the websites of Cochrane Library, PubMed/Medline and the American Dental Association (ADA) Center for Evidence-Based Dentistry were visited in order to find publications of critical abstracts of systematic reviews (SR). The keywords used were "motivational interviewing" AND "dental caries", and the search occurred during April 2021. No critical summary of SR published in the journals, on the Cochrane Library website and in the databases cited above was found. Next, a search for SR of randomized clinical trials was conducted in the Cochrane Library and PubMed/Medline databases, following the recommendation of the adapted 6S System¹⁷. This search resulted in two SR on the topic, thus finalizing the search for new publications. After a thorough reading of both papers, a critical analysis was performed to answer the questionnaire. The methodological quality of the SR included in this review was assessed using the PRISMA¹⁸ (27 items) and AMSTAR-2¹⁹ (16 items) protocols.

Results

The search resulted in two SR (Table 1). The systematic review published in 2020 in The Journal of American Dental Association by Faghihian *et al.*²⁰ aimed to evaluate the available scientific evidence regarding

the use of MI for clinical caries reduction in early childhood when compared with traditional oral health education. Searches of PubMed, Cochrane, Scopus and Embase databases resulted in a total of 329 papers in the English language. Fourteen papers were read in full and 6 papers were excluded after evaluation of the eligibility criteria. Different interventions, behavioral outcomes, differences in the control group, and other reasons led to the exclusion of these papers. After careful evaluation, 8 papers were included in an evidence table and analyzed qualitatively. These publications took place between the years 2004 and 2018. Only 1 paper was considered to have moderate risk of bias, and all the others had high risk of bias due to lack of information about the random allocation of participants and masking of participants and investigators. Of these 8, only 3 studies were included

in the meta-analysis and revealed that there was a reduction in the dental caries index of children addressed by MI, however without a statistically significant difference. The other 5 studies included in the SR showed inconclusive results. Thus, the evidence was considered limited due to the presence of heterogeneous studies, with moderate to high risk of bias, based on different methodologies.²⁰

The 2021 SR by Colvara *et al.*²¹ was published in the journal *Community Dentistry and Oral Epidemiologic* and investigated the effectiveness of MI in preventing dental caries in early childhood. The primary outcome observed in the studies was the presence of new carious lesions, and secondary endpoints involved caregiver knowledge of oral health, daily oral health habits, plaque and gingival index,

Table 1. Main results and description of systematic reviews with meta-analyses included.

Title	Year	Journal	Authors	Country	Papers in initial search	Papers read in full	Papers included in qualitative review	Papers included in the meta-analysis	Meta-analysis result
<i>Impact of motivational interviewing on early childhood caries: A systematic review and meta-analysis</i>	2020	Journal of the American Dental Association	Reyhaneh Faghiehian, Elham Faghiehian, Azam Kazemi, Mohammad J Tarrahi, Mehrnaz Zakizade	Irán	329	14	8	3	Reduction of 2.83 decayed surfaces/teeth (CI=-0.83/ 6.49) Non-significant difference
<i>Motivational interviewing for preventing early childhood caries: A systematic review and meta-analysis</i>	2021	Community Dentistry and Oral Epidemiology	Beatriz C Colvara, Daniel D Faustino-Silva, Elisabeth Meyer, Fernando N Hugo, Roger K Celeste, Juliana B Hilgert	Brasil	1498	18	14	8	Overall reduction of 0.61 decayed surfaces/teeth (CI=-1.22/-0.01) High risk of caries: reduction of 3.15 carious surfaces/teeth (CI=-6.14/-0.17) Significant differences

Table 2. Quality assessment and risk of bias of the included systematic reviews

Author, year	PRISMA (score)	Risk of bias	AMSTAR-2 (score)	Risk of bias	Quality
Faghihian <i>et al.</i> ²⁰ , 2020	22	Low	25	Low	High
Colvara <i>et al.</i> ²¹ , 2021	26	Low	25	Low	High

as well as fluoride varnish applications. The control groups were characterized by assessing the outcomes resulting from any type of oral health education or no intervention at all. Unrestricted language searches were conducted in PubMed, EMBASE, Virtual Health Library, Scopus, Cochrane Central Register of Controlled Trials, Web of Science, LILACS and Google Scholar. A total of 1,497 papers were identified in the databases, and 1 was identified through another source. The total of 14 publications were evaluated qualitatively, and 8 were subjected to quantitative evaluation through meta-analysis. Publications between the years 2007 and 2018 were included in the meta-analysis. Only two clinical trials were characterized with low risk of bias, four had moderate risk and two of them contained high risk of bias. The included studies were conducted in seven countries and included Aboriginal, Australian, low-income African American, and Canadian children. Most studies used only MI as an intervention, with the longest follow-up period around three years and the shortest less than one year. In populations with high caries experience, MI was shown to be more relevant preventing, on average, 3.15 new decayed, lost or filled teeth/surfaces (-6.14 - 0.17, 95 % IC) in the primary dentition. The authors concluded that MI showed a potential to modify the knowledge and behavior of the population and reduce the number of new carious

lesions, mainly in children with high dental caries experience, where the challenge of controlling the disease is greater.

Table 2 shows the methodological quality of the two included SR, using the PRISMA and AMSTAR-2 protocols.

Discussion

Dental surgeons need to constantly seek information to assist in clinical decision-making, and so many scientific texts available can make this process rather difficult.¹⁷ In addition, a flood of misinformation is making it difficult for reputable sources and evidence-based guidelines to be found by knowledge seekers, and in times of the Covid-19 pandemic, it has taken on an even greater proportion. The infodemic has been recognized as a long-term public health threat.²²

The 6S Model adapted from Medicine was proposed for dental surgeons to use as a strategy to resolve clinical doubts based on the best available scientific evidence, and was used, in this review, to seek an answer from an established clinical doubt: "Can motivational interviewing be used to prevent dental caries in preschool children?" It is important to highlight that the reason for choosing the adapted 6S Model as a strategy for solving clinical

doubts was the simplicity of the method. It proved to be possible to be adopted by undergraduate students or clinical dentists who do not have specialized training in complex methods of literature reviews, thus preventing content with low methodological rigor from being chosen to guide clinical conduct. In this study, SRs performed from randomized clinical trials were used to resolve the question, since critical abstracts were not found. However, during the quality assessment of the papers (a critical phase of the SR), the authors reported that the vast majority of clinical trials contained medium or high risk of bias.

It is worth noting that both SRs included in this integrative review used the PRISMA¹⁸ protocol for risk of bias analysis. The PRISMA protocol consists of 27 items that need to be reported in systematic reviews and meta-analyses to ensure a standardized and thorough evaluation of the quality of the included clinical trials. On the other hand, the SR published in 2020 included only papers in the English language, and made use of a smaller number of databases for the search. Only studies whose control group required the traditional oral health education strategy were included. Due to differences in the dental caries rates described in the studies, only 3 studies were submitted to meta-analysis and found a significant difference when compared to the traditional intervention. However, due to the presence of systematic errors observed in the studies, the authors were conservative and considered the SR inconclusive. The AMSTAR 2¹⁹ tool was used in this integrative review for an assessment of the methodological

quality of the included systematic reviews. Both SRs were considered to have good methodological quality, since all items on the 16-item checklist were met with a YES response.

Regarding the limits described in the study by Colvara *et al.*²¹, we highlight the presence of a small sample of clinical trials included in the meta-analysis (n=8), control groups with different evaluated interventions, few studies whose population had a high risk for dental caries, different criteria for the diagnosis of dental caries, and the use of different references for the chosen dental caries index. The authors revealed a wide variety of methodologies used in the clinical trials, however, populations with high caries experience may benefit from MI, and further studies are needed to more robustly clarify the effects of this intervention.

The SR studies reported that MI can be considered a promising intervention for dental caries control in children, and that MI is effective in preventing this disease in early childhood,^{20,21} even though previous studies have not confirmed this hypothesis.²⁰

Conclusion

The practice of MI may contribute to the prevention of dental caries in preschoolers, especially those at high risk. However, the evidence is moderate, obtained from poor meta-analyses and a limited number of randomized studies of good methodological quality.

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