Early childhood caries: A bibliometric analysis

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Abstract

It is estimated that 48% of children globally and over 70% of those in Malaysia suffer from early childhood caries (ECC). ECC leads to losing permanent teeth at a very early age, malnutrition, and lower quality of life. This review aimed to systematically gather studies on ECC and determine key factors associated with it using bibliometric analysis. A systematic search was conducted using the “early childhood caries” keyword in the Scopus database. A total of 2,038 articles were selected based on the selection criteria (Type: Article, Language: English) for bibliometric analysis using VOSviewer 1.6.19. The keyword analysis showed seven clusters with thematic categories such as microbes (cluster 1: red), oral health awareness (cluster 2: green), diet (cluster 3: purple), socio-economic (cluster 4: blue &: 5: yellow), and prevention or treatments (cluster 6: orange & 7: light blue). Based on the keyword analysis, the main factor associated with ECC is microbiome dysbiosis, however, it is difficult to determine an ideal microbiome because it is influenced by other factors such as aging. Socioeconomic is the second most important factor, followed by dental care and diet. All the main factors are associated as increase in sugar intake affect the microbiome by favoring certain bacteria such as *Streptococcus mutans*. Lower-income parents might not have enough resources such as money and time to look after their children and prevent the development of ECC. Many treatments have been proposed, but all have their own limitations. Hence, prevention might still be the best way forward. Short questionnaires and molecular analysis of saliva could be an ideal mixed method design to better understand the factors associated with ECC.

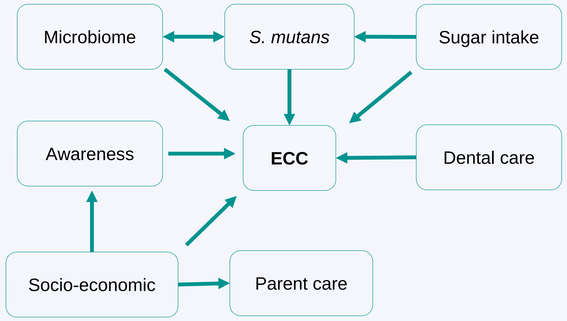
Background

ECC continue to be a major pediatric healthcare emergency. In Malaysia ECC prevalence was reported to be as high as >70% despite government programs.

Approaches included: oral and salivary bacteria count (e.g., *Streptococcus mutans* count and *Lactobacillus* count); chemical characteristics of saliva (e.g., buffering capacity and pH), personal oral hygiene (e.g., visible plaque levels), diet (e.g., sugar intake) and socioeconomic level which is prone to human bias (patient survey and accuracy of collected data) and error (dentist judgment). These lead to unreproducible results.

Three genera with the highest abundances in the ECC group were *Neisseria, Streptococcus* and *Prevotella*, same as those in caries-free group.

ECC is a multifactorial problem that need detailed analysis to determine and rank these factors.



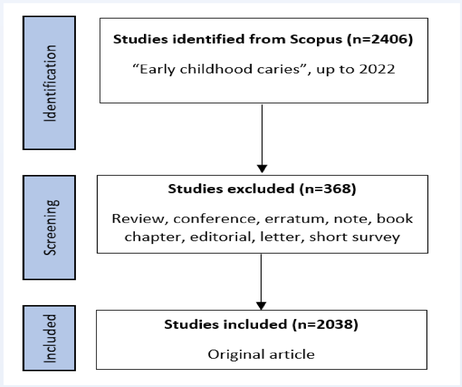
Correlation of factors associated with ECC

Aim

1. To systematically gather studies on ECC and then use bibliometric analysis to determine quantitatively the key factors associated with ECC.

2. To use bibliometric analysis to rank those major factors and identify correlations.

Method



PRISMA flowchart of the search method

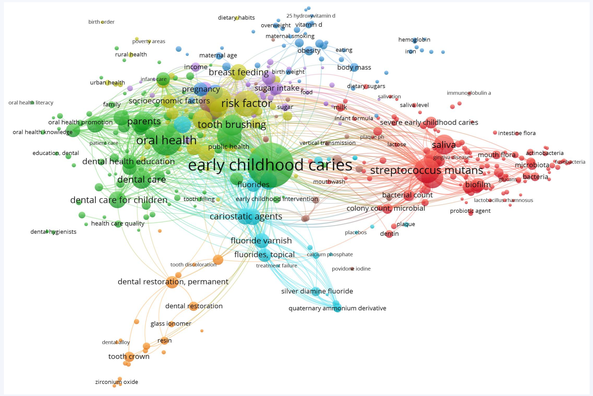
Scopus®

VOSviewer
Visualizing scientific landscapes
Nees Jan van Eck and Ludo Waltman
Centre for Science and Technology Studies
Leiden University

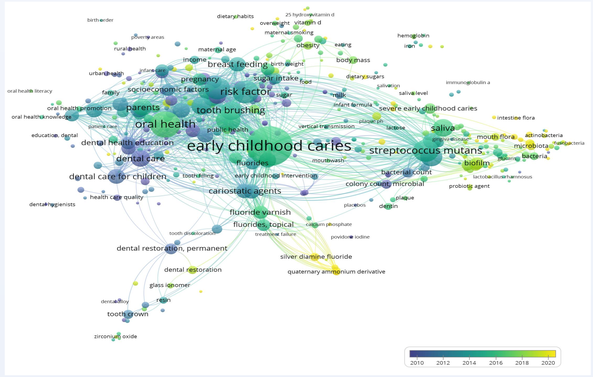
Version 1.6.19

Excel

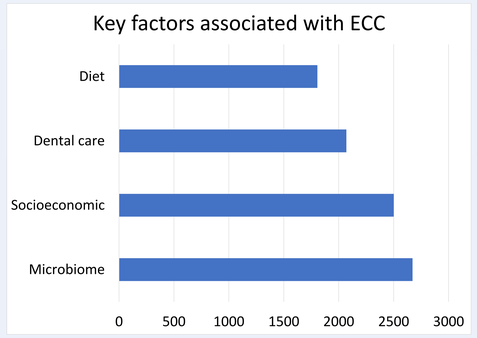
Results

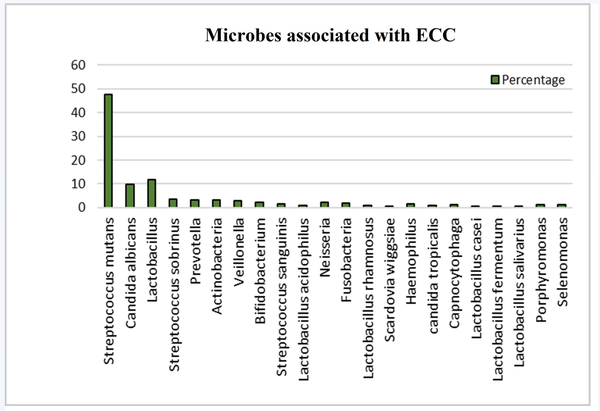


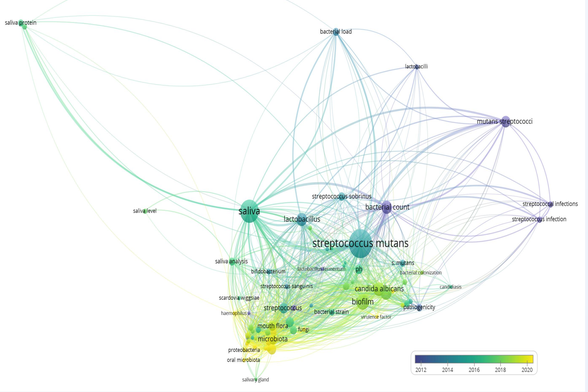
Network of keyword analysis



Network of keyword analysis across years







Network of keyword analysis for microbes

Conclusion

Though *S. mutans* is the ECC driver, microbiome dysbiosis play a major role in the ECC development indirectly. Current approaches to solve ECC appear to be ineffective.

Short questionnaires and molecular analysis of saliva could be an ideal mixed method design to better understand the factors associated with ECC.

Narrow-spectrum and low cost antimicrobial agents might be more effective treatment for ECC.

Acknowledgment

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