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SYSTEMATIC REVIEW

Sense of coherence and dental fear/dental anxiety: A systematic review and meta-analysis

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Abstract

Aim: The aim of this systematic review and meta-analysis was to evaluate the association between sense of coherence (SOC) and dental fear/dental anxiety.

Methods: Computerized searches were performed in six databases. Gray literature and manual searches were also conducted. Study selection, risk of bias assessment, and meta-analyses were performed. The results of meta-analyses were reported in odds ratio (OR), mean difference (MD), and confidence interval (CI).

Results: After removing duplicates, 131 references were retrieved and the full texts of 12 were evaluated. Nine references met the eligibility criteria and were included. The results of meta-analyses demonstrated that individuals with a weaker SOC had a score in the dental anxiety/dental fear scale 6.04 times higher than individuals with a stronger SOC (OR = 6.04, CI = 2.62–13.91). Individuals with no dental anxiety/dental fear had a mean score of the SOC scale higher than individuals with dental anxiety/dental fear (MD = 5.39, CI = 2.21–8.56). Sensitivity analysis demonstrated that the result of a higher mean score of the SOC scale among individuals with no dental anxiety/dental fear remained (MD = 7.38, CI = 3.79–10.98). Risk of bias ranged from low to high. The certainty of evidence was very low.

Conclusion: Individuals with stronger SOC have lower levels of dental fear/dental anxiety.

KEYWORDS
behavior, dental anxiety, dental fear, meta-analysis, sense of coherence, systematic review

1 | INTRODUCTION

Fear is a behavioral state or emotional condition of reluctance during which an individual is inclined to avoid a particular and forthcoming menace. The features of fear comprise fleeting alertness that rapidly disappears following the avoidance of the threat.[1] Phobia is the exaggerated and continuous fear of a particular circumstance or object.[2] Anxiety is also a behavioral defense or emotional condition of aversion. However, anxiety takes place while

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an individual faces an unclear and dubious menace. The features of anxiety comprise continuous vigilance and alertness that may persist following the removal of the threat.[1] Dental fear and dental anxiety generally refer to a negative feeling associated with dental treatment.[3] Although both are often treated as similar outcomes in the dental literature, they represent different concepts.[4] While dental fear represents a short-lived reaction with which the individual denies treatment in a fit of hysteria, dental anxiety is a continuous negative emotional state that something bad is going to happen in the dental setting.[5] The reported prevalence of dental fear and dental anxiety in children and adolescents varies from 5% to 33%, depending on the country where the assessment was conducted.[6] Dental fear and dental anxiety may be associated with endogenous factors, such as traits of personality and cognitive skills as well as exogenous factors, such as previous adverse experiences and the vicarious learning of the individual from others information sources, such as media or his/her relative.[7] In addition, it is important to note that people with fear or anxiety avoid dental appointments or show uncooperative behavior during visits to the dentist.[8]

In 1979, Antonovsky coined the sense of coherence (SOC), a concept developed to classify the unique way with which an individual views his/her life and how he/she manages stressful events in one's life span.[9] SOC has three elements: comprehensibility (understanding of events that take place in the course of life), manageability (necessary resources to deal with the events), and meaningfulness (the capacity of interpreting positive and negative events and the belief that life is worth living).[10] Stemming from the salutogenic model, the SOC was used to assess survivors of the Holocaust. Antonovsky realized that they were able to stay healthy even after the horrible experience they had gone through.[11] Therefore, SOC focuses on personal strengths that allow individuals to overcome harsh realities, maintaining quality of life, and a positive well-being.[12] The stronger the SOC of an individual, the greater is his/her capacity to deal with stressful situations and stay healthy.

In the literature, there have been studies that evaluate the association between dental fear/dental anxiety and SOC.[13,14] It is important to conduct a study that aggregates data from original studies to assess how much the SOC can have an impact on dental fear/dental anxiety. Thus, the present systematic review and meta-analysis aimed to evaluate the association between SOC and dental fear/dental anxiety. The hypothesis of this study is that a weaker SOC is associated with higher levels of dental fear/dental anxiety.

2 | MATERIALS AND METHODS

This systematic review and meta-analysis was reported according to the Preferred Report Items for Systematic Reviews and Meta-Analysis (PRISMA).[15]

2.1 | Eligibility criteria

Cross-sectional, case–control, and longitudinal studies in which the association between SOC and dental fear/dental anxiety had been measured were eligible for inclusion in this systematic review and meta-analysis. The following PEO question[16] has been applied:

P (population) = individuals
E (exposure of interest) = SOC
O (outcome) = dental fear/dental anxiety

Abstracts of meetings, editorials, qualitative studies, and letters to the editor were excluded. No restrictions on language or publication dates were imposed.

2.2 | Information sources and search strategy

Computerized searches (up to August 2021) were performed in the following electronic databases: PubMed (National Library of Medicine), Web of Science (Thomson Reuters), EMBASE (Elsevier), CINAHL (EBSCO), Psycinfo (EBSCO), and Scopus (Elsevier). Gray literature search in Open Grey and a search in Google Scholar limited to the first 200 hits[17] were also performed. Specific search strategies for each database were developed. For PubMed, the following search strategy combining terms and Boolean operators was used: dental anxiety [MeSH] OR dental phobia [Entry Term] OR dental fear [Entry Term] OR odontophobia [Entry Term] OR dental stress [Text Word] AND sense of coherence [MeSH] OR salutogenic [Text Word]. Supporting Information File 1 displays the search strategies for the other electronic databases. Manual searches were carried out to find any unidentified article through electronic searches. After all, for studies that were not found, contact with authors was made. Duplicate hits were removed from the list upon identification.

2.3 | Study selection

The selection of the included studies was performed in two phases. In phase 1, two independent reviewers

evaluated the title and abstract of each reference found. References whose title and abstract met the eligibility criteria were included straight away. References whose title and abstract did not provide sufficient information for a decision on inclusion/exclusion were assessed in phase 2. The independent reviewers assessed the full text of the references in phase 2. References that met the eligibility criteria were included as well. Discrepancies between reviewers regarding inclusion or exclusion of the study were resolved consulting a third author of the systematic review and meta-analysis.

2.4 | Data collection process

The data were extracted by two reviewers independently. Both reviewers analyzed the information provided in each article included. Discrepancies were resolved consulting a third author of the systematic review and meta-analysis. For missing information on included studies' data, the authors were contacted.

2.5 | Data items

The data extracted from the included studies were: last name of the first author, year of publication, country where the study had been carried out, sample size, age and sex of the individuals, scales used for measurement of dental fear/dental anxiety, the scale used for measurement of SOC, and the main results on the association between SOC and dental fear/dental anxiety.

2.6 | Risk of bias in individual studies

The risk of bias was measured using the Joanna Briggs Institute (JBI) tool of the University of Adelaide.[18] In longitudinal studies, the following items were evaluated: recruitment of exposed and non-exposed participants, measurement of exposure in exposed and non-exposed participants, validity of the instrument for measuring the exposure, identification of confounding factors, strategies to deal with confounding factors, participants free of the outcomes at the start of the study or at the moment of exposure, validity of the instrument for assessing the outcome, follow-up period long enough for the outcome to occur, losses, strategies utilized to address incomplete follow-up, and statistical analysis.

In the cross-sectional studies, the following items were evaluated: inclusion criteria, description of participants, setting and time period of the study, validity of the instrument for measuring the exposure, criteria for assessing the condition, identification of confounding variables, strategies for dealing with confounding variables, measurement of the outcome, and use of adequate statistical analysis. In each longitudinal or cross-sectional study, the items were awarded with "low risk of bias" or "high risk of bias." Two reviewers independently assessed the risk of bias within included studies. If there was any disagreement between reviewers, a third author was consulted and decided.

2.7 | Summary measures

Any measure that examined the association between SOC and dental fear/dental anxiety, such as odds ratio (OR), prevalence ratio (PR), confidence interval (CI), relative risk (RR), mean difference (MD), or *p* value was considered.

2.8 | Synthesis of results

The results of studies with similar methods were aggregated. The software Review Manager 5.4 (Rev Man, Cochrane) was used to evaluate the association between SOC and dental anxiety/dental fear. The generic inverse variance was used with the OR and the standard error. The standard error was obtained subtracting the lower limit of the 95% CI from the upper limit of the 95% CI. The result was divided by 3.92. Statistical heterogeneity was assessed by means of the I^2 statistics.[19] Due to the clinical heterogeneity between studies incorporated into the meta-analysis, the random effect model was employed. The result of the meta-analysis was provided in OR and 95% CI.

The association between SOC and dental anxiety/dental fear was also evaluated with values of mean and standard deviation. The random effect model was also employed. The result of the meta-analysis was provided in MD and 95% CI.

2.9 | Sensitivity analysis

Sensitivity analysis was carried out for meta-analysis with I^2 statistics above 40%.[19] The fixed effect model was deployed.

2.10 | Reporting bias assessment

To assess reporting bias, outcomes reported in the methods and in the results of the included studies were compared.

2.11 | Risk of bias across studies

The risks of bias in relation to several publications were assessed in this systematic review and meta-analysis. For this evaluation, the unit of analysis considered was the study and not the publication.

2.12 | Grading of recommendations, assessment, development, and evaluation (GRADE)

The certainty of evidence was assessed with the GRADE system. For each outcome assessed, the GRADE evaluates the number of studies included, the studies' design, risk of bias, inconsistency, indirectness, imprecision, and publication bias. Depending on the seriousness of the issue, the evidence could be downgraded in one or two levels. The certainty of evidence for the outcome assessed could be: very low, low, moderate, or high.[20]

3 | RESULTS

3.1 | Study selection

The selection process of references included in this systematic review and meta-analysis is presented in the flow chart (Figure 1). A total of 180 records were identified through the search in the five electronic databases. After the removal of 49 duplicates, 131 references remained. The title and abstract of the 131 references were assessed regarding eligibility. A total of 118 hits were excluded and 13 references were selected for full text assessment.

The full text of one article[21] was not identified. Attempts to contact the authors and to purchase the article online were performed, but the study was unavailable. Among the 12 references whose full text was evaluated, three did not meet the eligibility criteria. One article was a literature review. In one article, the association between dental anxiety/dental fear and SOC was not evaluated and in one article, SOC was a confounding factor. The references of the three articles excluded after the assessment of full texts are provided in Supporting Information File 2. In this systematic review and meta-analysis, nine studies were included.[13,14,22–28]

3.2 | Characteristics of included articles

The included articles were eight cross-sectional studies[13,14,22–27] and one longitudinal study.[28] Date of publication was between 2011 and 2021, and the language of publication was English. The studies were conducted in Norway,[14] Iran,[28] Sweden,[13,22,23,25] India,[26,27] and Finland.[24] In seven articles, the short version of the SOC scale with 13 items was used.[14,22–25,27,28] In one, the SOC-3 with three items was used[13] and in one, the SOC-9 with nine items was used.[26] Regarding the assessment of dental anxiety, two studies used the Corah Dental Anxiety Scale (C-DAS),[14,26] three used the Modified Dental Anxiety Scale (MDAS),[24,27,28] and one used the Dental Anxiety Question (DAQ).[13] In two studies, dental fear was assessed and the Dental Fear Survey (DFS) was employed.[23,25] In one study, no specific questionnaire for assessing dental fear was used.[22] In six included studies, the tool for dental fear/dental anxiety had been validated according to the country where the study was conducted.[13,14,23–25,28] In two studies, it was unclear whether the questionnaire was validated.[26,27]

3.3 | Sample characteristics

The sample size of the studies ranged from 400 to 3500 individuals. Seven studies[13,14,22–24,26,28] had a sample with more than 500 participants. In three studies, the number of participants exceeded 1000.[13,14,28] One study evaluated adults between 20 and 29 years.[14] In one study, individuals from 20 to 80 years participated.[22] Two studies assessed adolescents who were approximately 15 years.[24,28] In one study, individuals from 19 to 96 years participated.[13] In one study, individuals between 12 and 16 years participated.[26] In two studies, individuals between 38 and 50 years took part in the survey.[23,25] In one study, individuals who were 20 year or older participated.[27] In seven articles, male and female individuals were recruited.[13,14,22,24,26–28] In two studies, only women participated.[23,25] A summary of the characteristics of the included studies is displayed in Supporting Information File 3.

4 | RESULTS OF INDIVIDUAL STUDIES

4.1 | Association of SOC and dental anxiety

In one study,[14] SOC was significantly associated with dental anxiety. Individuals with a lower SOC were more likely to have dental anxiety. One study[26] demonstrated that older adolescents had a weaker SOC and higher dental anxiety. In two studies, no association between SOC and dental anxiety was observed.[13,24] In one study,[27] the correlation between MDAS and SOC-13 was −0.97 ($p = .01$), indicating the higher the SOC-13 score (stronger SOC), the lower the MDAS score (lower levels of dental anxiety). Finally, a longitudinal study[28] showed a significant association

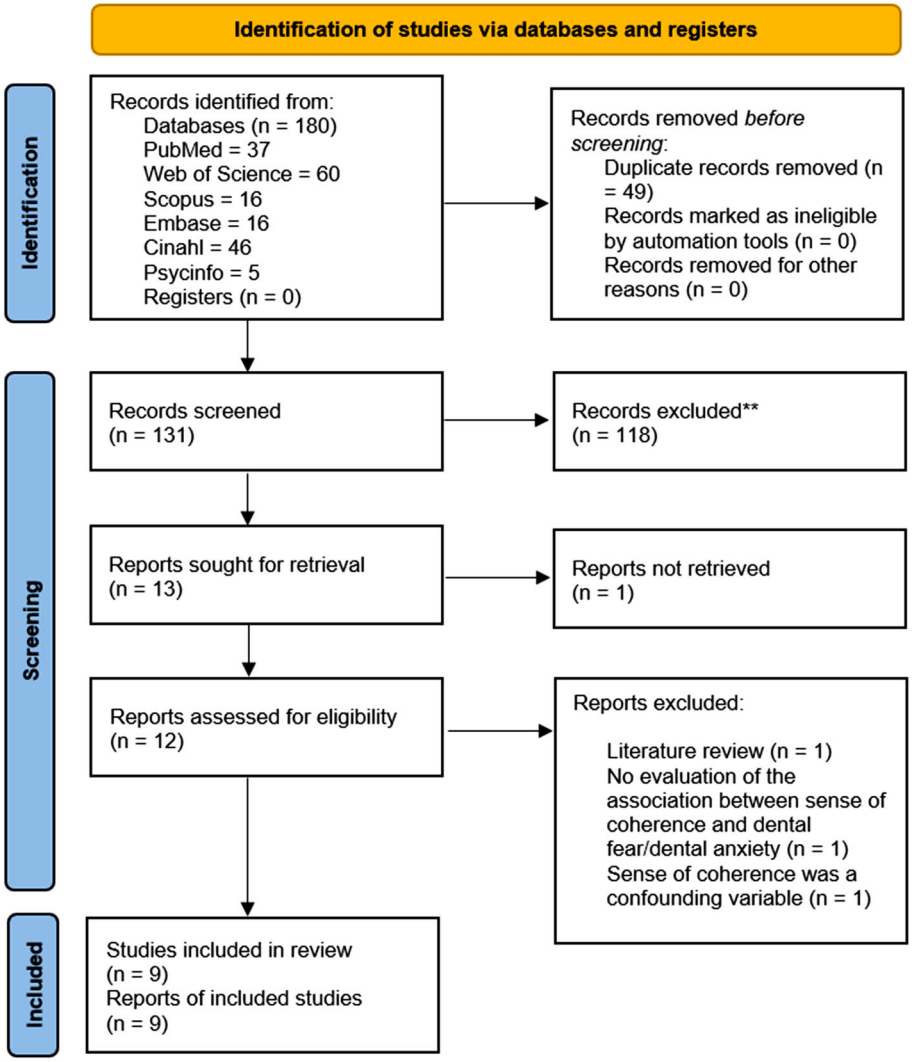


FIGURE 1 Flowchart of the systematic review and meta-analysis

between SOC and dental anxiety. People with a weaker SOC had increased levels of dental anxiety.

4.2 | Association of SOC and dental fear

One study[25] demonstrated that individuals with a weaker SOC had higher levels of dental fear. One study demonstrated that individuals with a higher SOC had no dental fear.[22] In one study,[23] the analysis of SOC and dental fear was descriptive and no measurement of association between the two variables was provided.

4.3 | Risk of bias assessment

The assessment of risk of bias of the included longitudinal and cross-sectional studies is shown in Supporting Information Files 4 and 5. The longitudinal study[8] was awarded with high risk of bias in the management of confounding variables and the insufficient follow-up time adopted in the study. As regards the cross-sectional studies, two articles were awarded with low risk of bias in the definition of inclusion criteria, use of standard criteria for measurement of the condition, and measurement of the outcome in a valid and reliable way.[13,14] All included studies were awarded with low risk of bias in the description of subjects, setting, and time. Three included articles[13,14,28] were awarded with low risk of bias in the measurement of the exposure in a valid and reliable way. One article[24] was awarded low risk of bias in the identification and management of confounding variables as well as statistical analyses employed. One article[22] was awarded with high risk of bias in clearly inclusion criteria, use of standard criteria, and exposure measured in a valid way.

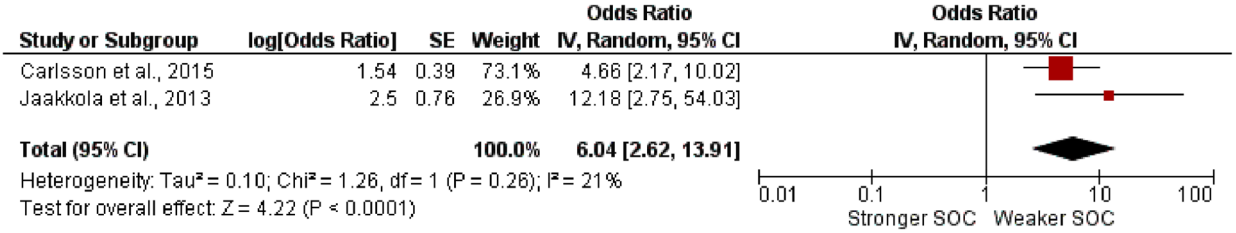


FIGURE 2 Meta-analysis comparing dental anxiety/dental fear between individuals with a weaker SOC and those with a stronger SOC. SOC, sense of coherence

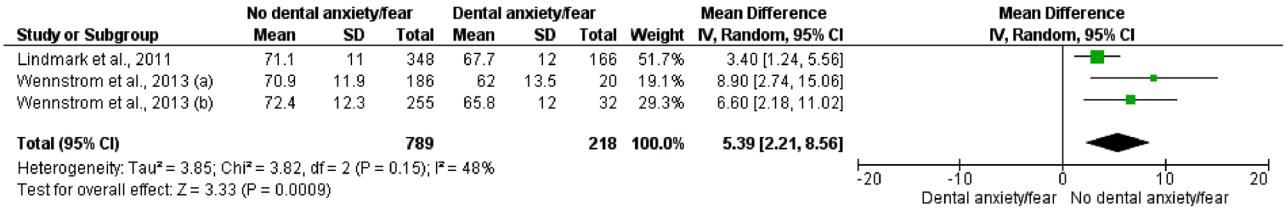


FIGURE 3 Meta-analysis comparing the SOC score between individuals with no dental anxiety/dental fear and those with dental anxiety/dental fear. SOC, sense of coherence

4.4 | Synthesis of results

Two studies were incorporated into a meta-analysis comparing dental anxiety/dental fear between individuals with a weaker SOC and those with a stronger SOC. The results demonstrated that individuals with a weaker SOC had a score in the dental anxiety/dental fear scale 6.04 times higher than individuals with a stronger SOC (OR = 6.04, CI = 2.62–13.91, $I^2 = 21\%$) (Figure 2).

Studies were incorporated into a meta-analysis comparing the SOC score between individuals with no dental anxiety/dental fear and those with dental anxiety/dental fear. The results demonstrated that individuals with no dental anxiety/dental fear had a mean score of the SOC scale higher (stronger SOC) than individuals with dental anxiety/dental fear (MD = 5.39, CI = 2.21–8.56, $I^2 = 48\%$) (Figure 3).

4.5 | Sensitivity analysis

One study was removed from the meta-analysis comparing the SOC score between individuals with no dental anxiety/dental fear and those with dental anxiety/dental fear. The I^2 plummeted to 0% and the results remained. Individuals with no dental anxiety/dental fear had a mean score of the SOC scale higher (stronger SOC) than individuals with dental anxiety/dental fear (MD = 7.38, CI = 3.79–10.98, $I^2 = 0\%$) (Figure 4).

4.6 | Grading of recommendations, assessment, development, and evaluation (GRADE)

The certainty of evidence was very low for the meta-analysis comparing dental anxiety/dental fear between individuals with a weaker SOC and those with a stronger SOC (Supporting Information File 6) and for the meta-analysis comparing the SOC score between individuals with no dental anxiety/dental fear and those with dental anxiety/dental fear (Supporting Information File 7).

5 | DISCUSSION

There is evidence in the dental literature that dental fear/dental anxiety is a condition that can be influenced by psychological factors.[29] The studies included[14,22,25,26,28] in this systematic review and the results found in the meta-analysis showed that there is an association between SOC and dental fear/dental anxiety. It is important to highlight that the articles evaluating this relationship are recent in the literature, as the first study with which such a hypothesis had been drawn and tested, was published in 2011.[22]

In route to the interpretations of these associations, one can observe that dental anxiety/dental fear is a multidimensional construct that involves neurobiological and behavioral components. When an individual loses control of these components, he/she begins to make sense

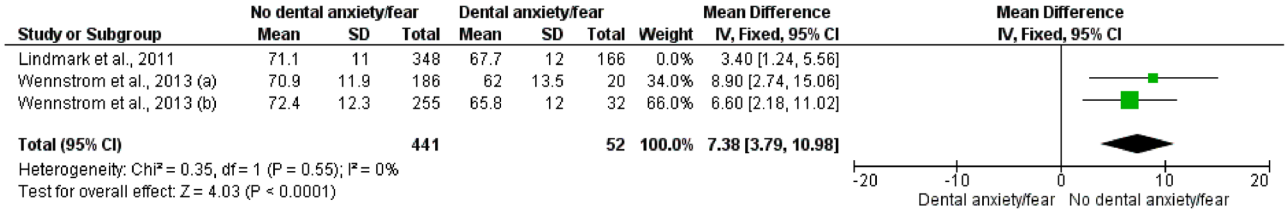


FIGURE 4 Sensitivity analysis comparing the SOC score between individuals with no dental anxiety/dental fear and those with dental anxiety/dental fear. SOC, sense of coherence

of dental appointments as a source of threats against himself/herself.[30] Dental anxiety/dental fear are driven by valence and arousal. Both are typically characterized by a negative emotional valence, but, while the duration of the arousal in dental fear is phasic or brief, for dental anxiety, the duration is tonic or sustained.[1,31] Anxious and fearful individuals avoid dental treatment, which, in turn, will have a negative impact on their oral health. A person with a weaker SOC is more likely to experience increased levels of dental anxiety/dental fear, because, in his/her perspective, the stimuli caused by an atypical or unusual situation such as going to the dentist are interpreted as dangerous and threatening. In addition, the individual faces difficulties to use available resources to overcome an experience that he/she thinks is challenging.[32] Conversely, a stronger SOC precludes the development of stress even when the individual is facing a stressful situation, such as the dental visit. Individuals with a stronger SOC may pursue the resources and the capacity to develop improved coping mechanisms to confront dental anxiety/dental fear.[13,24]

It is worth saying that dental anxiety/dental fear may be a condition associated with traumatic experiences resulting from the individual's previous contact (in particular children) with dental procedures, which he/she interpreted as a negative experience. Contact with information from such sources as the media and other people[33] who refer to dental treatment as an event associated with pain and discomfort caused, for example, by anesthetic procedures or the noise of the turbine is also associated with dental anxiety/dental fear.[34] Therefore, a weaker SOC determines the lack of the capacity of individuals to adapt, which would, in turn, allow them to nullify the negative effects of preceding traumatic situations.[35]

As a concept based on the way through which people see their lives, a strong SOC is associated with a greater chance of the individuals to pursue adequate tools to deal with predictable or unpredictable and manageable or unmanageable situations, thus reducing the risk of illnesses.[36] Moreover, the salutogenic theory identifies a series of tools recognized as general resistance resources that include possessions, experience, knowledge, commitment, self-esteem, social support, social capital, and societal traditions.[32] The higher the SOC, the more resilient the people are and the greater their ability to understand and to apply tools that allow them to deal with harsh situations.[9] In this sense, a stronger SOC is associated with lower levels of dental anxiety and dental fear. This relationship tends to increase the frequency of dental appointments and dental treatment sought out by individuals.[37] The counseling of oral health care providers, along with good oral hygiene behaviors,[37] will result in better clinical parameters, with less dental caries,[38] better periodontal health,[39 and a] better quality of life.[40]

This systematic review and meta-analysis provides useful information for stakeholders regarding the usefulness of the three components on SOC in daily practice.[37–39,41] Awareness of the three components of the salutogenic theory (comprehensibility, manageability, and meaningfulness) may be an important tool to strength the SOC of individuals, which can contribute to the improvement of their behaviors, such as going to the dentist[37] and their oral health.[38,39] Regarding comprehensibility, it is important to explain the nature of dental treatment to individuals. Well-informed individuals who are aware of the treatment,[42] they will undergo, are likely to experience lower levels of dental fear/dental anxiety. As for the manageability component, it is important for the clinician and the health service to provide support and anticipatory guidance to the patients[43] who will undergo dental treatment so that they become aware of helpful resources to overcome the fear/anxiety during dental care. Finally, the meaningfulness component that can be improved through health care provider efforts to enhance the motivation of the patients[42] so that they can perceive the dental treatment as something positive and not as something that is ultimately related to factors that cause fear or anxiety. For infants and children, information, support, and guidance will be provided to parents/caregivers, who are the main decision makers regarding the oral health of young individuals.[44]

This systematic review and meta-analysis has some shortcomings. The first regards the study design of the included articles. In most articles, a cross-sectional study was conducted[13,14,22–27] precluding the determination of a cause-and-effect relationship between the evaluated outcomes of dental anxiety/dental fear and SOC. Another limiting factor was that most included studies associated SOC

with several other factors and not only with dental anxiety/dental fear, without an adequate control of confounding factors by means of appropriate statistical analyses, which may have led to bias.[45] It is also important to mention that not all included studies used validated questionnaires to assess SOC,[26,27] dental anxiety,[26,27] and dental fear.[23–25] In addition, the included articles used the terms dental anxiety and dental fear interchangeably, although they are acknowledged in the literature as different concepts. Finally, few studies meeting the eligibility criteria were available in the literature and, therefore, the body of knowledge on the association between dental fear/dental anxiety and SOC is not robust.

Despite of the usefulness of the results found in this study, it is noteworthy that more studies are necessary to fully clarify the associations between dental anxiety/dental fear and SOC. It is also important to emphasize that this systematic review and meta-analysis can be a source of information that allows researchers to better define which type of studies on this issue are still necessary. First, further research may confirm whether the existing self-report measures to evaluate dental fear/dental anxiety fit the diagnostic, behavioral, and neurobiological concepts related to general fear/anxiety.[1] In these future studies, the SOC can also be related to other particularities of the dental environment, such as, for example, the predisposition to some diseases and oral disorders. Moreover, the SOC can also be approached by means of clinical trials, in which the effectiveness of interventions to strengthen the SOC of individuals, mitigating dental fear and dental anxiety, is assessed. Another type of study that can be performed is a longitudinal study so that it is possible to better assess the relationship of cause and effect between SOC and dental fear/dental anxiety. Thus, further research on SOC will help to improve the knowledge of the association between this concept and dental fear/dental anxiety.

PROTOCOL AND REGISTRATION

A protocol for this systematic review and meta-analysis has been registered and can be accessed in the International Prospective Registry for Systematic Reviews (PROSPERO). The following registration number was assigned to the systematic review and meta-analysis: CRD42020208486

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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REFERENCES

1. Sylvers P, Lilienfeld SO, LaPrairie JL. Differences between trait fear and trait anxiety: Implications for psychopathology. *Clin Psychol Rev*. 2011;31:122-137.
2. American Psychiatric Association, DSM-5 Task Force. *Diagnostic and Statistical Manual of Mental Disorders: DSM-5™. 5th ed.*. American Psychiatric Publishing, Inc.; 2013.
3. Wu L, Gao X. Children's dental fear and anxiety: Exploring family related factors. *BMC Oral Health*. 2018;18:100.
4. Cianetti S, Lombardo G, Lupatelli E, et al. Dental fear/anxiety among children and adolescents. A systematic review. *Eur J Paediatr Dent*. 2017;18:121-130.
5. Klingberg G, Broberg AG. Dental fear/anxiety and dental behavior management problems in children and adolescents: A review of prevalence and concomitant psychological factors. *Int J Paediatr Dent*. 2007;17:391-406.
6. Gatchel RJ. The prevalence of dental fear and avoidance: Expanded adult and recent adolescent surveys. *J Am Dent Assoc*. 1989;118:591-593.
7. Beaton L, Freeman R, Humphris G. Why are people afraid of the dentist? Observations and explanations. *Med Princ Pract*. 2014;23:295-301.
8. Seligman LD, Hovey JD, Chacon K, Ollendick HO. Dental anxiety: An understudied problem in youth. *Clin Psychol Rev*. 2017;55:25-40.
9. Antonovsky A. *Health, Stress and Coping*. Jossey-Bass Publishers; 1979.
10. Cortelo FM, Marba STM, Cortellazzi KL, et al. Women's sense of coherence and its association with early weaning. *J Pediatr (Rio J)*. 2018;94:624-629.
11. Lindstrom B, Eriksson M. Contextualizing salutogenesis and Antonovsky in public health development. *Health Promot Int*. 2006;21:238-244.
12. Antonovsky A. *Unravelling the Mystery of Health: How People Manage Stress and Stay Well*. Jossey-Bass Publishers; 1987.
13. Carlsson V, Hakeberg M, Boman UW. Associations between dental anxiety, sense of coherence, oral health-related quality of life and health behaviour – a national Swedish cross-sectional survey. *BMC Oral Health*. 2015;15:100.
14. Holde GE, Baker SR, Jönsson B. Periodontitis and quality of life: What is the role of socioeconomic status, sense of coherence, dental service use and oral health practices? An exploratory theory-guided analysis on a Norwegian population. *J Clin Periodontol*. 2018;45:768-779.
15. Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *J Clin Epidemiol*. 2021;134:178-189.

16. Moola S, Munn Z, Sears K, et al. Conducting systematic reviews of association (etiology): The Joanna Briggs Institute's approach. *Int J Evid Based Healthc*. 2015;13:163-169.
17. Haddaway NR, Collins AM, Coughlin D, Kirk S. The role of Google Scholar in evidence reviews and its applicability to grey literature searching. *PLoS One*. 2015;10:e0138237.
18. Aromataris E, Munn Z, eds. JBI Manual for Evidence Synthesis. JBI; 2020. Available from https://synthesismanual.jbi.global
19. Higgins JPT, Green S, eds. Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 (updated March 2011). The Cochrane Collaboration; 2011. Retrieved from www.cochrane-handbook.org
20. Balshem H, Helfand M, Schünemann HJ, et al. GRADE guidelines: 3. Rating the quality of evidence. *J Clin Epidemiol*. 2011;64:401-406.
21. Iwaizumi Y, Kawai T, Tsuruta R, Sakai A, Tsukamoto N, Hayakawa Y. Relationship between sense of coherence and dental phobia. *J Japanese Dent Soc Anesthesiol*. 2017;45:8-12.
22. Lindmark U, Hakeberg M, Hugoson A. Sense of coherence and its relationship with oral health-related behaviour and knowledge of and attitudes towards oral health. *Community Dent Oral Epidemiol*. 2011;39:542-253.
23. Boman UW, Anette W, Ulrika S, Magnus H. Oral health-related quality of life, sense of coherence and dental anxiety: An epidemiological cross-sectional study of middle-aged women. *BMC Oral Health*. 2012;12:1-6.
24. Jaakkola S, Rautava P, Saarinen M, et al. Dental fear and sense of coherence among 18-yr-old adolescents in Finland. *Eur J Oral Sci*. 2013;121:247-251.
25. Wennstrom A, Wide Boman U, Stenman U, Ahlqwist M, Hakeberg M. Oral health, sense of coherence and dental anxiety among middle-aged women. *Acta Odontol Scand*. 2013;71:256-262.
26. Viswanath D, Krishna AV. Correlation between dental anxiety, Sense of Coherence (SOC) and dental caries in school children from BangaloreNorth: A cross-sectional study. *J Indian Soc Pedod Prev Dent*. 2015;33:15.
27. Naveen N, Pradhan A, Singh S, Borkar P. Dental anxiety and sense of coherence among outpatient department patients of a dental college in Chhattisgarh: A correlational study. *J Indian Assoc Public Health Dent*. 2021;19:27-31.
28. Pakpour AH, Lin CY, Kumar S, Fridlund B, Jansson H. Predictors of oral health-related quality of life in Iranian adolescents: A prospective study. *J Investig Clin Dent*. 2018;9:e12264.
29. Asl AN, Shokravi M, Jamali Z, Shirazi S. Barriers and drawbacks of the assessment of dental fear, dental anxiety and dental phobia in children: A critical literature review. *J Clin Pediatr Dent*. 2017;41:399-423.
30. Kendall PC. *Child and Adolescent Therapy: Cognitive-Behavioral Procedures*. Guilford Press; 2011.
31. Citron FM, Gray MA, Critchley HD, Weekes BS, Ferstl EC. Emotional valence and arousal affect reading in an interactive way: Neuroimaging evidence for an approach-withdrawal framework. *Neuropsychologia*. 2014;56:79-89.
32. Lindstrom B, Eriksson M. Salutogenesis. *J Epidemiol Community Health*. 2005;59:440-442.
33. Gao X, Hamzah SH, Yiu CKY, McGrath C, King NM. Dental fear and anxiety in children and adolescents: Qualitative study using YouTube. *J Med Internet Res*. 2013;15:e29.
34. van Houtem CMHH, Aartman IHA, Boomsma DI, Ligthart L, Visscher CM, Jongh A. Is dental phobia a blood-injection-injury phobia? *Depress Anxiety*. 2014;31:1026-1034.
35. Surtees PG, Wainwright NW, Khaw KT. Resilience, misfortune, and mortality: Evidence that sense of coherence is a marker of social stress adaptive capacity. *J Psychosom Res*. 2006;61:221-227.
36. Eriksson M, Lindstrom B. Antonovsky's sense of coherence scale and its relation with quality of life: A systematic review. *J Epidemiol Community Health*. 2007;61:938-944.
37. Elyasi M, Abreu LG, Badri P, Saltaji H, Flores-Mir C, Amin M. Impact of sense of coherence on oral health behaviors: A systematic review. *PLoS One*. 2015;10:e0133918.
38. Torres TAP, Corradi-Dias L, Oliveira PD, et al. Association between sense of coherence and dental caries: Systematic review and meta-analysis. *Health Promot Int*. 2019;35:586-597.
39. Olivo EAC, Corradi-Dias L, Paiva SM, et al. Association between sense of coherence and periodontal outcomes: A systematic review and meta-analysis. *Fam Community Health*. 2021;44:225-234.
40. Orgeta V, Sterzo EL. Sense of coherence, burden, and affective symptoms in family carers of people with dementia. *Int Psychogeriatr*. 2013;25:973-980.
41. Antonovsky A. The salutogenic model as a theory to guide health promotion. *Health Prom Int*. 1996;11:11-18.
42. Super S, Wagemakers MAE, Picavet HSJ, Verkooijen KT, Koelen MA. Strengthening sense of coherence: Opportunities for theory building in health promotion. *Health Prom Int*. 2016;31:869-878.
43. Tan KK· , Chan SWC, Wang W, Vehvilainen-Julkunen K. A salutogenic program to enhance sense of coherence and quality of life for older people in the community: A feasibility randomized controlled trial and process evaluation. *Patient Educ Couns*. 2016;99:108-116.
44. Miller AP, Kameka M, Young-Whiting C. The effects of an oral health intervention on caregivers of Head Start children. *J Natl Black Nurses Assoc*. 2012;23:52-58.
45. Waddington H, Aloeb AM, Beckerc BJ, et al. Quasi-experimental study designs series – paper 6: Risk of bias assessment. *J Clin Epidemiol*. 2017;89:43-52.

SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

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