Review

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The psychosocial web of oral health: exploring the links between sense of coherence, dental anxiety and quality of life in adolescents

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Abstract: The dynamic interplay between oral health-related quality of life (OHRQoL), sense of coherence (SOC), and dental anxiety has garnered increasing attention in recent years, highlighting the need for a comprehensive understanding of their interconnections. This review synthesizes current evidence from interdisciplinary research to explore how these constructs interact and influence one another. OHRQoL reflects the functional, psychological, and social impact of oral health, while SOC represents an individual's capacity to perceive life as comprehensible, manageable, and meaningful. Dental anxiety, a prevalent barrier to oral healthcare, can significantly impair OHRQoL and is influenced by both subjective health perceptions and coping mechanisms. The literature indicates that a strong SOC may mitigate dental anxiety and buffer the negative effects of poor oral health on quality of life. Conversely, heightened dental anxiety can lead to avoidance behaviors, exacerbating oral health problems and diminishing OHRQoL. This review underscores the importance of a biopsychosocial approach in dental care, advocating for integrative strategies that enhance SOC and reduce anxiety to improve overall oral health outcomes and patient well-being. Gaps in the literature and directions for future research are also discussed, with emphasis on longitudinal studies and intervention-based approaches.

Keywords: sense of coherence; oral health related quality of life; dental; anxiety

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Introduction

Oral health is a fundamental component of overall well-being, extending beyond the absence of disease to encompass physical, psychological, and social dimensions. In recent decades, there has been growing recognition of the intricate interplay between psychological factors and oral health outcomes. Among these, Sense of Coherence (SOC), Dental Anxiety (DA), and Oral Health-Related Quality of Life (OHRQoL) have emerged as key psychosocial constructs that shape individuals' oral health behaviours, perceptions, and experiences [1].

Sense of Coherence, a central concept in Antonovsky's salutogenic model, reflects an individual's capacity to perceive life as comprehensible, manageable, and meaningful [2, 3]. Individuals with a strong SOC are generally more resilient in the face of stress and are better able to adopt positive health behaviours, including those related to oral hygiene and dental care. SOC has been linked to health-promoting behaviours, better coping strategies, and enhanced subjective health outcomes. Conversely, Dental Anxiety is a prevalent psychological condition characterized by excessive fear or stress associated with dental settings and procedures. High levels of dental anxiety often lead to avoidance of dental care, which in turn can result in deterioration of oral health and a cycle of increasing anxiety and worsening outcomes [4]. Dental anxiety can be influenced by early negative experiences, personality traits, and broader psychological vulnerabilities, and it significantly impairs engagement with oral health services. Oral Health-Related Quality of Life represents a multidimensional framework that captures the functional, emotional, and social impact of oral health on an individual's daily life. It reflects how oral health affects self-esteem, communication, social participation, and overall life satisfaction [5]. OHRQoL is increasingly used as a patient-centered outcome in both clinical and public health contexts.

The relationships among SOC, DA, and OHRQoL are complex and likely bidirectional. For instance, individuals with a strong SOC may be better equipped to manage dental

anxiety and maintain regular dental care, thereby preserving better OHRQoL. Conversely, high dental anxiety may diminish OHRQoL both directly and indirectly by contributing to oral health neglect. Understanding these interconnections is essential for the development of holistic and effective oral health interventions that address not only clinical needs but also the psychological well-being of patients.

While each of the constructs – Sense of Coherence (SOC), Dental Anxiety (DA), and Oral Health-Related Quality of Life (OHRQoL) – has been individually studied in relation to oral health, there remains a significant gap in the literature concerning their interrelated dynamics. SOC, as a psychological resilience factor, may act as a buffer against the negative effects of dental anxiety, influencing how individuals perceive and respond to oral health challenges. At the same time, dental anxiety is a known risk factor for avoidance of care, which often leads to poor oral health and diminished OHRQoL. These constructs likely do not operate in isolation; rather, they interact in complex and potentially cyclical ways, with SOC possibly moderating or mediating the effects of anxiety on perceived quality of life. Understanding these relationships holistically is critical for developing targeted interventions that go beyond symptom management to address the underlying psychological drivers of oral health behaviour and perception.

The aim of this review is to synthesize existing literature on the interplay between Sense of Coherence, Dental Anxiety, and Oral Health-Related Quality of Life, with a particular focus on how these variables influence and relate to one another. The review seeks to summarize key findings from empirical studies examining direct and indirect relationships among the three constructs; identify conceptual and methodological gaps in current research; and highlight potential pathways for intervention and further investigation.

Methodology

The scope of this review includes peer-reviewed quantitative studies involving adolescents, adults, and older populations, with a primary focus on research published within the last 10 years. The review adopts a narrative approach, allowing for a comprehensive and theory-informed synthesis of the literature across various study designs and populations.

The literature search was conducted across multiple electronic databases, including PubMed, Scopus, Web of Science and Embase. The search included a combination of Medical Subject Headings (MeSH) and free-text keywords such as “Sense of Coherence” OR “SOC”, “Dental Anxiety” OR “Dental Fear” OR “Dental Phobia”, and “Oral Health-Related Quality of Life” OR “OHRQoL” OR “Oral Health Quality of Life”. These terms were combined using Boolean operators (AND, OR) to ensure the retrieval of relevant studies that addressed the associations and interactions among these variables. Additional terms such as “association”, “relationship”, “influence”, “interplay”, and “correlation” were included to capture studies that specifically examined the nature of the relationships between the constructs. The search was limited to peer-reviewed articles published in English between 2005 and 2025, with full-text availability. The strategy was adapted for each database’s indexing system and search syntax to maximize the sensitivity and specificity of the results.

Results

As many as 1,016 records were identified through the literature search. After removing duplicates and screening titles and abstracts, 173 unique articles were selected for full-text review. Of those, 14 studies met the inclusion criteria. A flow chart outlining the screening process and obtaining the final number after exclusions and full text evaluation is presented in Figure 1. The reviewed articles meeting the inclusion criteria, along with their key characteristics, have been summarised in Table 1.

A total of 12 studies and two systematic reviews met the inclusion criteria and were reviewed (Table 1). The studies covered diverse populations including children, adolescents, adults, and community-based samples across different countries (Brazil, India, Saudi Arabia, Germany, Israel, Norway, Sweden, and Malaysia). Most were cross-sectional in design, while two were systematic reviews and one was a meta-analysis.

Across the included studies, a consistent trend was observed: higher Sense of Coherence (SOC) was associated with better oral health-related quality of life (OHRQoL) and lower levels of dental anxiety (DA). Several studies also highlighted the moderating role of SOC, showing its buffering effect against adverse social or psychological contexts. Conversely, higher dental anxiety was repeatedly linked with poorer OHRQoL, avoidance of dental care, and increased psychosocial concerns. Both child and parental dental anxiety emerged as predictors of poorer OHRQoL in younger populations.

Discussion

This review aimed to explore and synthesize existing literature on the interplay between Sense of Coherence,

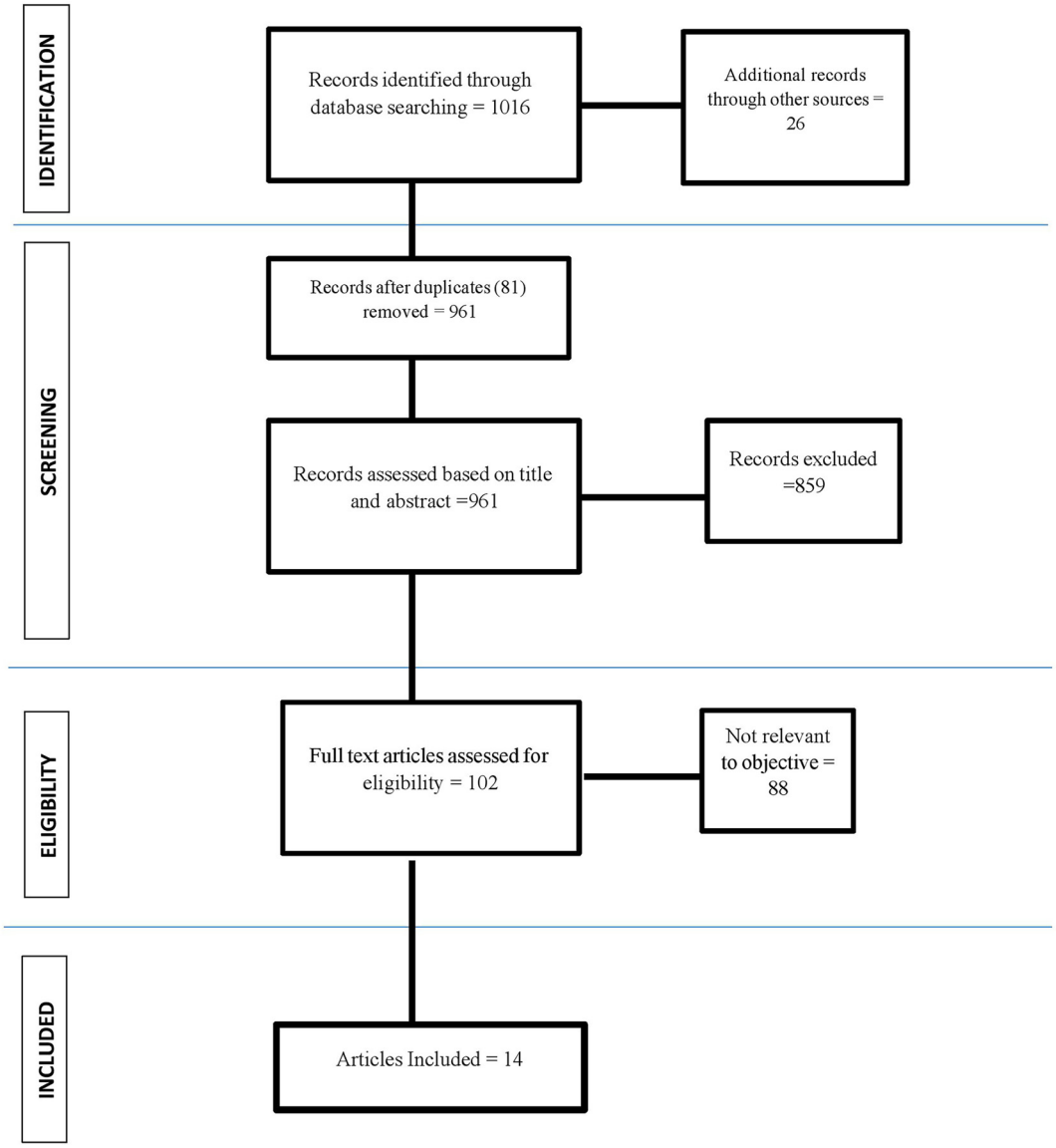

Figure 1: PRSIMA flow diagram.

Dental Anxiety, and Oral Health-Related Quality of Life. By examining how these psychosocial variables intersect, the paper seeks to highlight their combined impact on oral health outcomes and identify implications for research, clinical practice, and public health policy. The findings synthesized in this review highlight a consistent and robust relationship between sense of coherence (SOC), dental anxiety (DA), and oral health-related quality of life (OHR-QoL). Across diverse populations, cultures, and age groups, higher SOC emerged as a protective psychosocial resource, while higher DA was consistently associated with adverse oral health outcomes and reduced well-being.

Sense of coherence and dental anxiety

SOC and its role in fear perception and coping

Sense of Coherence (SOC), conceptualized by Antonovsky as a central component of the salutogenic model of health, represents a person's ability to perceive life as structured, predictable, and meaningful [3]. It comprises three core dimensions: comprehensibility (the extent to which one perceives internal and external stimuli as understandable), manageability (the belief in one's ability to cope with demands), and meaningfulness (the emotional investment in

Table 1: Summary of reviewed articles with key characteristics.

Study (author, year)	Population/ sample	Design	Measures (instruments)	Key findings	Effect direction tags
Carlsson et al. 2015 (Sweden) [1]	Adults, n≈3,000	Cross-sectional national survey	SOC-3; dental anxiety question (DAQ); OHIP-5	Higher SOC associated with better OHRQoL and lower DA; DA associated with worse OHRQoL.	↑SOC → ↑OHRQoL; ↑SOC → ↓DA; ↑DA → ↓OHRQoL
da Costa et al. 2017 (Brazil) [6]	Adolescents (Southern Brazil)	Cross-sectional	SOC (Antonovsky's 13-item SOC scale); self-perceived dental aesthetics (validated questionnaire)	Higher SOC associated with more positive dental aesthetics perception and fewer negative psychosocial impacts	↑SOC → ↑OHRQoL (perceptual)
Gomes et al. 2018 (Systematic review) [7]	Various populations	Systematic review	SOC scales (SOC-3, SOC-13, SOC-29); OHIP-14, GOHAI	Consistently, higher SOC linked to better OHRQoL across age groups; evidence moderate quality.	↑SOC → ↑OHRQoL
Naveen et al. 2021 (India) [8]	Adult dental outpatients (dental college, Chhattisgarh)	Cross-sectional, correlational	DA: Modified dental anxiety Scale (MDAS); SOC: Antonovsky's SOC-13	Negative correlation between DA and SOC; patients with higher SOC reported significantly lower dental anxiety	↑SOC → ↓DA; ↑DA → ↓well-being/OHRQoL (implied)
Alharbi et al., 2021 (Saudi Arabia) [9]	Children & adolescents	Cross-sectional	Dental anxiety (Children's fear Survey schedule – dental subscale, CFSS-DS); OHRQoL (COHIP-SF19); self-esteem scale	Higher DA predicted poorer child OHRQoL and lower self-esteem	↑DA → ↓OHRQoL
de Oliveira et al. 2022 (Systematic review) [10]	Adults and adolescents	Systematic review and meta-analysis	SOC: Antonovsky's SOC-13/SOC-29; DA: MDAS, DAS, CFSS-DS (children)	Pooled analysis showed significant inverse association between SOC and dental anxiety; higher SOC reduced odds of DA and fear across populations	↑SOC → ↓DA
Knorst et al. 2022 (Brazil) [11]	Schoolchildren	Cross-sectional	SOC (antonovsky SOC-13); OHRQoL (Child perceptions questionnaire, CPQ11–14); social capital indices	SOC moderated effect of social capital on OHRQoL; high SOC buffered against poor social context impacts	↑SOC buffers → ↑OHRQoL
Winkler et al. 2023 (Germany) [4]	Adults, general population (cross-sectional survey)	Cross-sectional	Dental anxiety: Dental anxiety Scale (DAS); OHRQoL: Oral health impact profile (OHIP-14); dental care routine: Self-reported attendance/ avoidance	Higher DA associated with avoidance of dental care and significantly worse OHRQoL scores; DA mediated relationship between care routine and OHRQoL	↑DA → ↓OHRQoL; ↑DA → ↓care routine
Shacham et al. 2023 (Israel) [12]	Adults (community sample)	Cross-sectional, moderated mediation analysis	DA: Modified dental anxiety Scale (MDAS); OHRQoL: OHIP-14; ageing anxiety: Aging anxiety Scale; Subjective accelerated ageing: Self-report scale	Higher DA associated with higher ageing anxiety; OHRQoL mediated the DA–ageing anxiety link, while subjective accelerated ageing moderated the pathway. Poorer OHRQoL amplified the negative impact of DA.	↑DA → ↓OHRQoL; ↓OHRQoL → ↑ageing anxiety
Lock et al. 2023 (Brzail) [13]	Male adolescents 18–19 y (military conscripts)	Cross-sectional	SOC (SOC-13); OHRQoL (OHIP-14)	Adolescents with moderate/high SOC had lower OHIP-14 impacts vs. low SOC	↑SOC → ↑OHRQoL
Junior et al., 2023 (Brazil) [14]	Adolescents 15–19 y (n~768)	Cross-sectional (nested cohort)	SOC (SOC-13); OHRQoL (CPQ11–14 short form); caries (DMFT index)	Higher SOC linked to better OHRQoL independent of caries experience	↑SOC → ↑OHRQoL
Mathisen et al. 2023 (Norway) [15]	Adults (population-based)	Cross-sectional	SOC-13; self-reported oral behaviors; clinical exam	SOC associated with toothbrushing habits but not with clinical oral status.	↑SOC → ↑oral health behaviors
Hegazi et al. 2024 (Saudi Arabia) [16]	Children 7–12 y (n~93)	Cross-sectional	Child DA (CFSS-DS); parental DA (dental anxiety Scale); OHRQoL (COHIP-SF19, child-reported)	Both child and parental DA associated with lower child OHRQoL	↑DA (child/ parent) → ↓OHRQoL

Table 1: (continued)

Study (author, year)	Population/ sample	Design	Measures (instruments)	Key findings	Effect direction tags
Al-Katheri et al., 2024 (Malaysia/ Yemeni adults) [17]	Yemeni adults in Malaysia	Cross-sectional	SOC-13; OHIP-14; social support	SOC associated with OHRQoL and perceived social support.	↑SOC → ↑OHRQoL

SOC, sense of coherence; DA, dental anxiety; OHRQoL, oral health-related quality of life; OHIP, oral health impact profile; OHIP-5/14, 5-item/14-item oral health impact profile; GOHAI, geriatric oral health assessment index; COHIP-SF19, child oral health impact profile-short form 19; CPQ, child perceptions questionnaire; CFSS-DS, children's fear survey schedule – dental subscale; MDAS, modified dental anxiety scale; DAS, dental anxiety scale; DMFT, decayed, missing, filled teeth index.

challenges faced) [2]. In the context of dental care, these components significantly shape how individuals perceive and respond to threatening or stressful stimuli, such as dental procedures or clinical environments. A person with a strong SOC is more likely to view dental treatment as understandable (comprehensibility), believe they have the internal or external resources to deal with it (manageability), and perceive it as a meaningful or worthwhile health-promoting activity (meaningfulness). As a result, such individuals are less prone to experience overwhelming fear or anxiety when facing dental situations [8, 10].

Furthermore, SOC influences coping mechanisms. Individuals with high SOC are more inclined to use active, problem-focused coping strategies, while those with low SOC may rely on avoidant or emotion-focused coping, which are often associated with higher dental anxiety and subsequent avoidance of care [18].

Empirical findings: is high SOC associated with reduced dental anxiety?

Several studies have examined the relationship between SOC and dental anxiety, and the majority of findings suggest an inverse association – that is, higher SOC is correlated with lower levels of dental anxiety. Lindmark et al. reported that older adults with strong SOC had reduced dental treatment-related anxiety and were more compliant with oral health care routines [19]. Carlsson et al., SOC found SOC to moderate the relationship between dental anxiety and oral health behaviors, suggesting that individuals with high SOC may be more resilient to anxiety-provoking experiences, including those related to dental care [1]. Empirical studies substantiate this theoretical role. Naveen et al. found that adult dental outpatients with higher SOC reported significantly lower dental anxiety levels, suggesting that SOC buffers against fear perception in clinical settings [8]. Consistently, de Oliveira et al., in a systematic review and meta-analysis, demonstrated an inverse association between SOC and dental fear across populations, concluding that higher SOC reduces the odds of experiencing dental anxiety [10]. Additional evidence from adolescent populations (da Costa et al.; Lock et al.; Junior et al.) further indicates that individuals with stronger SOC not only report lower psychosocial impacts of oral conditions but also engage in more adaptive perceptions of their oral health, reinforcing SOC's role as a resilience factor [6, 13, 14].

The findings position SOC as a central psychological construct in moderating dental anxiety, functioning through mechanisms of coping, resource mobilization, and stress appraisal (Carlsson et al.; Knorst et al.; Mathisen et al.) [1, 11, 15].

While these studies support the buffering role of SOC, they are mostly cross-sectional in design, limiting causal interpretation. However, the consistency of the association across age groups and cultural contexts reinforces the potential of SOC as a psychological protective factor against dental anxiety. In sum, a strong Sense of Coherence appears to act as a psychological shield that not only lowers the perception of dental situations as threatening but also fosters adaptive coping behaviors. These findings underscore the importance of considering SOC in both research and clinical interventions aimed at reducing dental anxiety.

The triangular relationship: SOC, dental anxiety, and oral health-related quality of life

The interrelationship among Sense of Coherence (SOC), Dental Anxiety (DA), and Oral Health-Related Quality of Life (OHRQoL) is a complex, dynamic network of psychological influences that shape how individuals perceive and respond to their oral health needs. Although most research has addressed these variables in pairs, an emerging body of

literature has begun to explore their combined effects, offering insight into potential causal pathways and mechanisms of influence.

Studies examining more than two constructs together

Several studies have simultaneously investigated SOC, DA, and OHRQoL, often within general population samples or specific clinical subgroups: Bonanato et al. studied Brazilian schoolchildren and found that low SOC was associated with increased dental anxiety, which in turn negatively impacted OHRQoL [20]. Their path analysis suggested that dental anxiety partially mediated the relationship between SOC and OHRQoL Carlsson et al. incorporated all three variables and observed that individuals with stronger SOC not only reported lower dental anxiety but also demonstrated better OHRQoL, particularly in the psychological discomfort and disability domains. They proposed that SOC directly influences both anxiety and quality of life perceptions [1]. Shacham et al. investigated a moderated mediation framework, showing that OHRQoL mediated the association between DA and ageing anxiety, while subjective accelerated ageing further moderated this pathway – highlighting the complex, multifactorial nature of these constructs [12]. In pediatric contexts, Hegazi et al. (2024) confirmed that both child and parental DA contributed to reduced child OHRQoL, underscoring that these dynamics may be intergenerational [16] Despite methodological differences, these studies consistently support the notion that SOC influences both dental anxiety and OHRQoL, either directly or through mediating psychological variables.

Proposed causal pathways

Based on the theoretical models and empirical findings, several causal pathways have been proposed:

a) SOC → DA → OHRQoL Individuals with higher SOC are more likely to interpret dental experiences as less threatening, resulting in lower dental anxiety. Reduced anxiety, in turn, promotes better oral health behavior and engagement with care, leading to improved OHRQoL.
b) SOC → OHRQoL (direct) Independent of anxiety, individuals with high SOC may perceive their oral health in a more positive and meaningful light, resulting in higher reported quality of life even in the presence of clinical oral issues.
c) DA → OHRQoL (direct) Elevated dental anxiety leads to avoidance of care, neglect of oral hygiene, and anticipatory distress, which are all associated with diminished OHRQoL.
d) Bidirectional feedback loops may also exist – for example, poor OHRQoL may increase psychological distress and reduce SOC over time, especially in vulnerable populations.

The evidence underscores both the detrimental role of dental anxiety (DA) and the protective and the protective role of sense of coherence (SOC) in shaping oral health-related quality of life (OHRQoL) Alharbi et al. (2021) demonstrated that higher levels of DA among children and adolescents in Saudi Arabia predicted significantly poorer OHRQoL and lower self-esteem, highlighting anxiety as an important psychological risk factor in early life [9]. In contrast, Gomes et al. (2018), through a systematic review, established that higher SOC was consistently associated with better OHRQoL across different age groups and cultural settings, indicating its broad and generalizable protective effect [7]. Building on this, Al-Katheri et al. (2024) reported that Yemeni adults residing in Malaysia with stronger SOC not only had higher OHRQoL but also perceived greater social support, suggesting that SOC operates not only at the individual coping level but also in connection with social-contextual resources [17]. Together, these findings emphasize a dual pathway: while DA undermines well-being and psychosocial outcomes, SOC acts as a resilience factor that promotes better quality of life and may be reinforced through supportive social environments.

Evidence of mediators and moderators

Several studies support the idea that dental anxiety acts as a mediator in the relationship between SOC and OHRQoL. This means SOC may not only exert a direct effect on how oral health is perceived but also influence it indirectly by reducing fear and avoidance behaviors [21] Other variables that may moderate these relationships include: Age: Older adults with high SOC may show stronger resilience to anxiety-related impacts on quality of life compared to younger individuals [12]. Gender: Some studies suggest women report higher DA but may also benefit more from a strong SOC in mitigating its effects [22]. Socioeconomic Status (SES): The protective effect of SOC may be more pronounced in individuals facing economic hardship or limited access to care [23]. These insights underscore the need to assess interaction effects in future studies using structural equation modeling (SEM) or longitudinal designs to better understand causality.

Gaps in the literature

Despite growing interest in the psychosocial dimensions of oral health, several notable gaps remain in the current literature examining the relationship among Sense of Coherence (SOC), Dental Anxiety (DA), and Oral Health-Related Quality of Life (OHRQoL):

- Limited Integration of Constructs in a Single Model: Most existing studies have investigated SOC, DA, and OHRQoL in isolation or in pairs, rather than exploring how all three constructs interact within a unified theoretical or statistical framework. As a result, the triangular relationship among these variables is poorly understood. Few studies employ models that examine mediating or moderating effects, such as SOC buffering the impact of DA on OHRQoL, which limits our ability to understand causal or indirect pathways.
- Predominance of Cross-Sectional Designs: The majority of available research is cross-sectional, providing only a snapshot of the associations between these variables. This design limitation precludes inferences about causality or directionality. Longitudinal studies are urgently needed to clarify whether a strong SOC can prospectively reduce dental anxiety or preserve OHRQoL over time, or conversely, whether poor OHRQoL and high anxiety erode one's SOC.
- Over-Reliance on Self-Report Measures: While SOC, DA, and OHRQoL are inherently subjective constructs, there is an over-reliance on self-report questionnaires, which may be prone to bias. Few studies incorporate objective clinical measures of oral health or triangulate self-reported data with behavioral observations or physiological indicators of anxiety.
- Underrepresentation of Diverse Populations: Research in this domain has largely focused on Western, adult populations, often neglecting children, adolescents, older adults, and culturally diverse groups. Given that SOC and DA may be shaped by cultural norms, socioeconomic context, and life-stage-related factors, this limits the generalizability of findings. There is also a lack of focus on vulnerable groups such as individuals with disabilities, migrants, or those with chronic health conditions.
- Lack of Intervention-Based Research: Although theoretical models suggest that enhancing SOC or reducing dental anxiety could improve OHRQoL, intervention studies are scarce. There is little evidence on whether psychological interventions – such as cognitive-behavioral therapy, stress management training, or SOC-enhancing programs – lead to measurable improvements in both anxiety and perceived oral health outcomes.
- Inconsistent Use of Measurement Tools: Studies vary widely in the tools used to assess SOC (e.g., SOC-13 vs. SOC-29), DA (e.g., MDAS, DAS, DFS), and OHRQoL (e.g., OHIP-14, GOHAI, COHIP), making it difficult to compare findings across studies. The lack of standardized, validated instruments across settings and populations hinders synthesis and meta-analysis.

In summary, although evidence supports meaningful relationships between SOC, DA, and OHRQoL, the field remains fragmented. More robust, interdisciplinary research is needed to clarify how these constructs interrelate, how they evolve over time, and how they can be effectively targeted through prevention and intervention strategies in clinical and community settings.

Conclusions

The triangular relationship between SOC, DA, and OHRQoL reflects a multifactorial, biopsychosocial dynamic, where SOC serves as both a protective and regulatory factor, influencing emotional responses to oral health and perceived quality of life. Dental anxiety acts as a critical link in this chain, mediating the psychological impact of SOC on daily oral health experiences. Understanding this interconnected framework opens new avenues for integrated interventions aimed at improving not just oral health outcomes, but overall well-being.

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Informed consent: Not applicable.
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Use of Large Language Models, AI and Machine Learning Tools: AI used for grammar corrections and language enhancement.
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