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Psychological and Behavioral Determinants of Oral Hygiene Adherence in Families: The Role of Parental Modeling, Motivation, and Education

Aseel Tariq¹

Author Affiliations

1. College of Medicine and Dentistry, Riyadh Elm University, Riyadh, Saudi Arabia

Abstract

Background

Oral hygiene adherence is a fundamental component of oral disease prevention and overall health promotion. Despite advances in preventive dentistry, dental caries and periodontal diseases remain highly prevalent worldwide. Family environments play a critical role in shaping oral hygiene behaviors, particularly during childhood, when lifelong habits are established. Psychological and behavioral determinants such as parental modeling, motivation, self-efficacy, oral health literacy, and family support influence adherence to recommended oral hygiene practices.

Aim

To review the current evidence regarding psychological and behavioral determinants of oral hygiene adherence in families, with particular emphasis on parental modeling, motivation, and oral health education.

Methodology

A narrative review of the literature was conducted using PubMed, Scopus, Web of Science, Cochrane Library, and Google Scholar. Studies published between 2000 and 2025 were searched using keywords related to oral hygiene adherence, parental modeling, oral health literacy, motivation, self-efficacy, family oral health behavior, and oral health education. Systematic reviews, meta-analyses, observational studies, qualitative studies, and intervention studies published in English were included. Relevant findings were synthesized narratively.

Results

The literature demonstrates that parental oral health behaviors, motivation, self-efficacy, oral health literacy, and supportive family environments significantly influence children's oral hygiene adherence. Positive parental role modeling and educational interventions improve oral hygiene practices, while low oral health literacy and inadequate family support are associated with poorer oral health outcomes. Theory-based interventions have shown promising results in promoting sustainable oral hygiene behaviors.

Conclusion

Oral hygiene adherence is influenced by multiple interconnected psychological and behavioral factors operating within the family environment. Family-centered oral health promotion programs focusing on parental education, motivation enhancement, and behavioral modeling may significantly improve oral hygiene practices and long-term oral health outcomes.

Keywords: Oral hygiene adherence, parental modeling, oral health literacy, motivation, self-efficacy, family behavior, oral health education, children.

Introduction

Oral diseases remain among the most common chronic health conditions worldwide and continue to impose a substantial burden on individuals, healthcare systems, and societies (1). Dental caries affects approximately 2.5 billion people globally, while periodontal diseases remain major causes of tooth loss and reduced oral health-related quality of life (1,2). Although these conditions are largely preventable, inadequate oral hygiene remains one of the principal risk factors contributing to their development and progression (3). Oral hygiene behaviors are established early in life and are strongly influenced by the family environment (4). Children depend on parents and caregivers not only for direct assistance with oral hygiene practices but also for guidance regarding attitudes, beliefs, and health-related behaviors.

The family represents the primary social context in which children learn and internalize health behaviors, making parental influence a critical determinant of oral health outcomes (5).

According to Social Cognitive Theory, individuals acquire behaviors through observation and imitation of significant role models (6). Parents therefore serve as influential behavioral models whose actions often influence children's oral hygiene habits more strongly than verbal instructions alone. Studies have demonstrated that children whose parents maintain regular toothbrushing routines and positive attitudes toward oral health are more likely to adopt similar behaviors and experience better oral health outcomes (4,7).

In addition to behavioral modeling, psychological factors such as motivation, self-efficacy, perceived

behavioral control, and health beliefs contribute substantially to oral hygiene adherence (8,9). Parents who are confident in their ability to supervise oral hygiene practices and who perceive oral health as a priority are more likely to establish effective oral health routines for their children (10). Similarly, oral health literacy, defined as the ability to obtain, understand, and utilize oral health information, has emerged as a significant predictor of oral health behaviors and outcomes (11).

Family environments characterized by supportive communication, positive reinforcement, and structured routines promote healthy oral hygiene behaviors, whereas socioeconomic challenges, parental stress, and inadequate knowledge may impede adherence (5,12). Consequently, understanding the psychological and behavioral determinants of oral hygiene adherence is essential for designing effective family-centered oral health interventions.

This review aims to examine the current evidence regarding parental modeling, motivation, self-efficacy, oral health literacy, family support, and educational interventions as determinants of oral hygiene adherence within families.

Aim

To critically review the psychological and behavioral determinants influencing oral hygiene adherence within families, with particular emphasis on parental modeling, motivation, oral health literacy, self-efficacy, and educational interventions.

Methodology

A narrative review of the literature was conducted to explore psychological and behavioral determinants influencing oral hygiene adherence within families. Electronic databases including PubMed, Scopus, Web of Science, Cochrane Library, and Google Scholar were searched for relevant studies published between 2000 and 2025. Search terms included "oral hygiene adherence," "parental modeling," "oral health literacy," "oral health education," "motivation," "self-efficacy," "family oral health behavior," "behavioral determinants," and related combinations.

Eligible studies included systematic reviews, meta-analyses, randomized controlled trials, cohort studies, cross-sectional studies, and qualitative research published in English. Articles investigating family influences on oral hygiene behaviors, parental oral health practices, psychological determinants, and educational interventions were included. Conference abstracts, editorials, opinion papers, and studies unrelated to family oral health behaviors were excluded. Findings were synthesized narratively to identify recurring themes and determinants associated with oral hygiene adherence.

Search Criteria

The literature search focused on studies investigating:

- Parental oral health literacy.
- Family influences on oral hygiene behaviors.
- Motivation and self-efficacy related to oral health.
- Behavioral theories explaining oral hygiene adherence.
- Educational interventions targeting parents and caregivers.
- Family-centered oral health promotion strategies.

Discussion

Parental Modeling and Social Learning

Parental modeling is widely regarded as one of the most influential determinants of children's oral hygiene behavior. Social Cognitive Theory proposes that children acquire behaviors through observation and imitation of significant individuals within their environment, particularly parents (6). As a result, parental oral health behaviors directly shape children's attitudes and practices regarding oral hygiene.

Several studies have demonstrated that children whose parents brush their teeth regularly are significantly more likely to brush twice daily and maintain adequate oral hygiene habits (4,7,13). Positive parental behaviors create a home environment where oral hygiene is perceived as a normal and expected part of daily life. In contrast, inconsistent parental oral hygiene practices may contribute to poor oral health habits and increased risk of dental caries among children.

Parental modeling extends beyond toothbrushing behaviors and includes attitudes toward dental visits, dietary choices, and preventive oral healthcare utilization. Parents who prioritize preventive dental care and demonstrate positive attitudes toward oral health foster similar values among their children. Consequently, parental modeling acts as both a direct and indirect mechanism through which oral health behaviors are transmitted across generations.

Motivation and Behavioral Intentions

Motivation is a critical determinant of health behavior and plays an essential role in maintaining long-term oral hygiene adherence. The Theory of Planned Behavior suggests that behavioral intentions strongly predict actual behavior and are influenced by attitudes, perceived social norms, and perceived behavioral control (14).

Parents who perceive oral health as important and recognize the benefits of preventive care are more likely to engage in oral health-promoting behaviors and supervise their children's oral hygiene routines. Intrinsic motivation, which arises from personal values and beliefs regarding oral health, has been shown to produce more sustainable behavior change than external motivation alone (15).

Motivation also influences persistence in maintaining oral hygiene routines despite competing family demands. Parents who understand the long-term consequences of poor oral hygiene are generally more committed to establishing consistent brushing routines and reinforcing healthy behaviors among their children. Therefore, interventions designed to enhance parental motivation may contribute substantially to improved oral hygiene adherence within families.

Self-Efficacy and Confidence in Oral Health Management

Self-efficacy refers to an individual's confidence in their ability to perform and sustain a particular behavior successfully (16). Within the context of oral hygiene, parental self-efficacy affects the extent to which caregivers supervise toothbrushing, enforce oral hygiene routines, and manage children's oral health needs.

Research has consistently identified self-efficacy as one of the strongest psychosocial predictors of oral hygiene behavior (8,9). Parents with high levels of self-efficacy are more likely to overcome barriers such as

time constraints, child resistance, and competing responsibilities. They are also more likely to seek oral health information and implement preventive measures. Conversely, low self-efficacy may result in inconsistent supervision, poor adherence to oral hygiene recommendations, and reduced utilization of preventive dental services. Strengthening parental self-efficacy through education, skills training, and professional support may therefore represent an effective strategy for improving oral hygiene adherence among children.

Oral Health Literacy and Educational Attainment

Oral health literacy has emerged as a major determinant of oral health behavior and outcomes. It encompasses an individual's ability to access, comprehend, evaluate, and apply oral health information effectively (11). Parents with higher oral health literacy are better equipped to understand preventive recommendations, recognize early signs of oral disease, and make informed decisions regarding oral healthcare (17). Numerous studies have demonstrated associations between low parental oral health literacy and increased prevalence of dental caries among children (11,17). Educational interventions targeting parents have shown significant improvements in oral health knowledge, attitudes, and behaviors (18). These interventions often focus on proper toothbrushing techniques, fluoride use, dietary counseling, and the importance of regular dental visits. Improved oral health literacy not only enhances parental knowledge but also strengthens confidence and motivation to maintain healthy oral hygiene practices.

Family Environment and Social Support

The family environment plays a crucial role in facilitating or hindering oral hygiene adherence. Family routines, communication patterns, emotional support, and behavioral expectations collectively influence children's oral health behaviors (5,12). Supportive family environments promote the establishment of structured oral hygiene routines and provide opportunities for supervision and reinforcement. Positive reinforcement, such as praise and encouragement, has been shown to improve children's compliance with toothbrushing recommendations (10). Family members may also serve as sources of accountability, helping maintain consistent oral hygiene behaviors. Conversely, socioeconomic disadvantage, parental stress, limited access to dental services, and competing family priorities may negatively impact oral hygiene adherence. These challenges often contribute to disparities in oral health outcomes and highlight the need for comprehensive family-centered interventions.

Behavioral Change Theories and Oral Health Promotion

Behavioral theories provide valuable frameworks for understanding and modifying oral hygiene behaviors. Social Cognitive Theory emphasizes observational learning and self-efficacy, while the Theory of Planned Behavior highlights the importance of attitudes, intentions, and perceived behavioral control (19,20). The Health Action Process Approach further distinguishes between motivational and volitional phases of behavior change, emphasizing planning and self-regulation in maintaining health behaviors (21). Theory-based interventions have demonstrated greater effectiveness than knowledge-based approaches alone because they address the psychological mechanisms

Discussion

underlying behavior change. Application of these theories in oral health promotion has resulted in improved toothbrushing frequency, greater parental involvement, and enhanced oral health outcomes among children and adolescents.

Digital Health and Emerging Educational Strategies

Recent advances in digital technology have created new opportunities for oral health education and behavior modification. Mobile health applications, text-message reminders, online educational platforms, and telehealth services have shown promising results in improving oral hygiene adherence and parental engagement (19). Digital interventions offer several advantages, including accessibility, personalization, cost-effectiveness, and scalability. Parents can receive timely reminders, educational content, and behavioral support without requiring frequent clinical visits. Such approaches may be particularly beneficial in underserved populations where access to oral healthcare resources is limited. Future oral health promotion programs should integrate digital technologies with traditional educational approaches to maximize engagement and long-term behavior change.

Conclusion

Oral hygiene adherence within families is influenced by a complex interaction of psychological, behavioral, educational, and environmental factors. Parental modeling, motivation, self-efficacy, oral health literacy, and family support represent key determinants that shape oral hygiene behaviors throughout childhood and adolescence. Evidence suggests that parents play a central role in establishing oral health routines and promoting positive oral hygiene behaviors through both direct supervision and behavioral modeling. Family-centered educational and behavioral interventions grounded in established psychological theories offer effective strategies for improving oral hygiene adherence and reducing oral disease burden. Strengthening parental knowledge, motivation, and confidence should therefore be considered a priority in future oral health promotion initiatives.

Limitations of the Study

This review has several limitations. First, as a narrative review, it lacks the methodological rigor of a systematic review and may be subject to selection bias. Second, the included studies differed considerably in design, populations, and outcome measures, limiting direct comparisons. Third, many studies relied on self-reported oral hygiene behaviors, which may be affected by recall and social desirability bias. Finally, much of the available evidence originates from developed countries, potentially limiting the applicability of findings to other cultural and socioeconomic contexts.

Future Recommendations

Future research should prioritize longitudinal studies investigating causal relationships between psychological determinants and oral hygiene adherence. Greater attention should be directed toward culturally sensitive family-based interventions, particularly in low- and middle-income countries. Researchers should explore emerging concepts such as

habit formation, parental stress management, and behavioral self-regulation. Furthermore, digital health technologies should be incorporated into oral health promotion strategies to improve accessibility, engagement, and sustainability of behavior change interventions. Finally, oral health policies should emphasize parental education and oral health literacy as key components of preventive oral healthcare.

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