

Scoping Review

Theoretical frameworks for explaining dental health service utilization: A scoping review

Cahyannisa Farah¹
Iwany Amalliah Badruddin^{2*}
Herry Novrinda²
Armasastra Bahar²
Han Dong-Hun^{3,4}

¹Master of Community Dentistry Program, Department of Dental Public Health and Preventive Dentistry, Faculty of Dentistry, Universitas Indonesia, Jakarta, Indonesia

²Department of Dental Public Health and Preventive Dentistry, Faculty of Dentistry, Universitas Indonesia, Jakarta, Indonesia

³Department of Preventive and Social Dentistry, Seoul National University School of Dentistry, Seoul, South Korea.

⁴Dental Research Institute, Seoul National University. Seoul, South Korea.

*Correspondence:
iwanybadruddin@gmail.com

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ABSTRACT

Introduction: Oral diseases remain a major global public health challenge, contributing to disability, reduced quality of life, and increased healthcare costs. Although regular dental attendance improves oral health outcomes, the utilization of dental health services remains unequal across population due to complex individual, social, structural, and policy-related factors. Theoretical models are essential for understanding these determinants and informing interventions to improve access and equity, yet a comprehensive synthesis of these models is lacking. This scoping review aimed to identify, map, and synthesize theoretical models used to explain dental health service utilization. **Methods:** A scoping review was conducted in accordance with the PRISMA Extension for Scoping Reviews (PRISMA-ScR). Eight electronic databases (PubMed, Scopus, ProQuest, Cochrane Library, ScienceDirect, SpringerLink, JSTOR, and Emerald Insight) were searched, supplemented by manual screening of reference lists. English-language publications from 1960 to 2025 that proposed, adapted, or conceptualized theoretical models of dental health service utilization were included. Study selection, duplicate removal, and screening were performed using Rayyan.ai, followed by a narrative synthesis of study characteristics, theoretical foundations, and model components. **Results:** Of the 1,037 records identified, 25 studies met the inclusion criteria. Most were published after 2000 and originated from high-income countries, particularly Europe and the United States, with limited evidence from middle-income settings. Models were applied across diverse populations, including children, adults, older adults, women, migrants, rural communities, and other vulnerable groups. Most were adaptations of established health service utilization frameworks, while fewer proposed novel or context-specific models. Determinants were consistently grouped into five domains: individual characteristics, enabling and structural factors, need-related factors, psychosocial influences, and broader contextual and policy determinants. **Conclusion:** This review provides a comprehensive synthesis of theoretical models explaining dental health service utilization. The findings offer a conceptual foundation for future research and support evidence-informed policies and interventions to improve equitable access to dental health services.

KEYWORDS

dental health services, utilization, theoretical model

INTRODUCTION

The World Health Organization has stated that oral diseases are among the most common diseases worldwide, affecting more than 3.6 billion people worldwide.¹ Notably, the global burden of oral diseases is greater than the

combined burden of the five leading non-communicable diseases in the world, exceeding it by nearly one billion cases.² Among all oral diseases, untreated caries in permanent dentition accounts for the greatest disease burden, followed by severe periodontitis, untreated caries in primary dentition, and edentulism, in descending order of magnitude.³

Oral diseases constitute a major public health issues at global, national, and regional levels, compromising individual and population health.³ Poor oral health reduces quality of life through pain, which can affect eating and speech, comfort, appearance, and social functioning.⁴ It can also increase the risk of other chronic diseases, such as diabetes mellitus, cardiovascular disorders, and chronic respiratory diseases.⁵

Similar to most non-communicable diseases, oral diseases are largely related to behavioral factors and preventable.⁶ Consequently, the utilization of dental services, both preventive and curative, is essential to achieving optimal oral health.⁷ Regular dental visits enable early diagnosis of oral health problems, which may lead to better oral health outcomes.⁸ However, dental service utilization remains unequally distributed across populations.^{6,7}

Dental health service utilization refers to the extent to which individuals or populations use dental health services within a given period for the purposes of disease prevention, treatment, health maintenance, or obtaining information related to oral health status.^{9,10} Dental health service utilization is multidimensional as it is affected by various factors, such as sociodemographic characteristics, individual factors, and access to dental care.¹¹ It also varies across different populations and regions.^{12–14}

Therefore, it is crucial to determine the factors that influence dental health services utilization in order to ensure that all individuals, populations, and communities have access to equitable, high-quality dental health care.¹⁵ The application of theoretical models to identify and explain these factors is essential, as doing so provide stronger conceptual guidance and can improve research quality and outcomes.¹⁵ However, research analyzing factors associated with dental health service utilization through theoretical models remains limited.^{12,16,17}

Despite the availability of several theoretical frameworks for explaining dental health service utilization, the literature remains highly fragmented across different target populations and regional contexts. To date, these models have not been comprehensively synthesized, limiting the availability of a unified conceptual basis for guiding holistic, evidence-based dental public health interventions. To address this critical research gap, this scoping review aims to systematically identify, map, and synthesize existing theoretical models and their key components. Ultimately, this comprehensive synthesis may provide a foundational for future research and support the development of more equitable policies and intervention related to dental health service utilization.

METHODS

The design and reporting of this scoping review followed established guidance for scoping reviews as outlined in the PRISMA Extension for Scoping Reviews (PRISMA-ScR).¹⁸ The review was structured to address two guiding questions concerning the theoretical models applied to dental health service utilization and the key components that define these models across varying contexts.

Articles published in English between 1960 and 2025 were considered eligible for inclusion. In accordance with the methodological approaches used in earlier reviews of theoretical models for health service utilization, this scoping review on literatures that either (1) proposed or introduced theoretical frameworks relevant to dental health service utilization, or (2) presented modifications or extensions of

previously established models in the context of dental care utilization.¹⁵ Eligibility was restricted to studies that explicitly theorized models or frameworks of dental health service utilization. Studies that solely applied existing theoretical models to particular oral health conditions, populations, or service settings without advancing the theoretical framework were excluded. In addition, quantitative or mixed-method studies that merely focused on empirically testing theoretical models without contributing to model development were excluded.

Eight databases were searched for relevant literature: PubMed, Scopus, ProQuest, Cochrane Library, ScienceDirect, SpringerLink, JSTOR, and Emerald Insight. In addition to the primary database search, secondary citation searching was conducted. This involved manually screening the reference lists of all initially included full-text articles to identify additional relevant studies that met the inclusion criteria but were not captured in the initial database queries. The search strategy combined terms related to dental health service utilization with terms referring to theoretical models and frameworks. MeSH terms and additional keywords were used to formulate the search query with Boolean operators. Hence, the core search query applied was ("dental care utilization" OR "dental service utilization" OR "oral health care utilization") AND (model* OR theory OR framework OR concept* OR theory* OR theoretic*), with database-specific adaptations.

Articles retrieved from all eight databases were imported into Rayyan.ai for reference management and screening. Duplicate records were identified and subsequently removed. There were two phases of the screening process. First, all articles were screened based on the titles and abstracts. Articles that failed to meet the inclusion criteria were removed. The final eligibility screening was determined through full-text assessments of the remaining articles. The quality of the final set of included studies was appraised using Joanna Briggs Institute (JBI) tools appropriate to the design of each included study.¹⁹ The process of study selection, the number of included studies, and reasons for exclusion were recorded and presented in the PRISMA flow diagram (Figure 1).²⁰

Data extraction was conducted directly within the Rayyan.ai platform, utilizing its customizable data extraction functionality to build a standardized extraction form. This custom form was specifically configured to capture the following fields: (1) author, (2) publication year, (3) study design, (4) target population, (5) purpose of the model, and (6) key components of the model. Extraction was performed by a single primary reviewer (C.F). To ensure reliability and mitigate potential bias, the screening results and the standardized extraction parameters within the custom form were reviewed and discussed extensively with the supervisory team (I.A, H.N) prior to the final full-text analysis and extraction phase. Tables and narrative synthesis were used to present scope and diversity of the existing theoretical models.

RESULTS

After a comprehensive search across eight databases, 1,270 records were identified. 1,037 records remained after 233 duplicates were removed; 1,012 records were also then excluded during the title and abstract screening because they were not relevant to the review. After full-text assessment of the remaining 25 articles, 11 were excluded due to unsuitable (ineligible) outcomes, resulting in 14 included studies from the database search. In addition, 11 records were identified through secondary citation searching. Of these, 10 were included for full-text evaluation, and eight were subsequently excluded because of ineligible outcomes. Consequently, two additional studies identified through citation searching were included, bringing the final total of 16 studies that fulfilled the inclusion criteria. The PRISMA 2020 flow diagram (Figure 1) presents the study selection process.²⁰

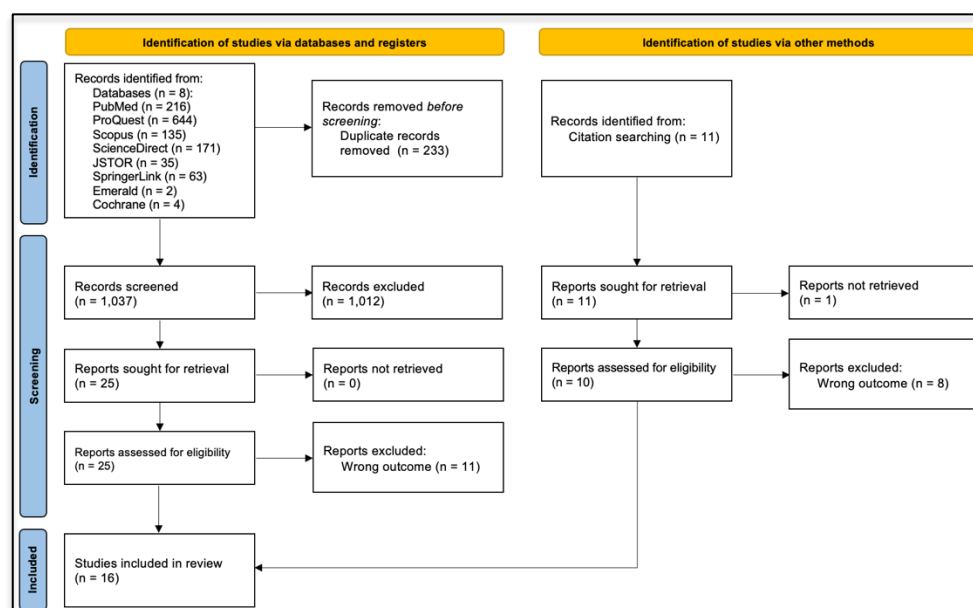


Figure 1. PRISMA-ScR flow diagram²⁰

The methodological quality of the included studies was assessed using the Joanna Briggs Institute (JBI) critical appraisal tools appropriate to each study design. The appraisal results are summarized in Figures 2–6.

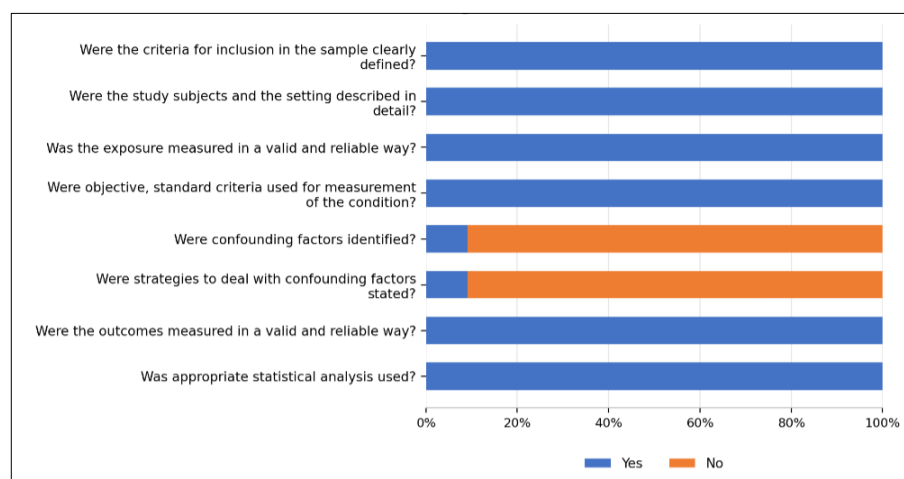


Figure 2. Risk of bias for cross-sectional studies

Overall, the cross-sectional studies (Figure 2) and cohort studies (Figure 3) generally showed a low risk of bias. The main weakness in both designs was related to confounding. Half of the cohort studies and all but one cross-sectional study (Chi & Leroux, 2012) did not identify confounding factors or report strategies to address them. Other domains, including exposure and outcome measurement, description of subjects, and statistical analysis, were adequately met.

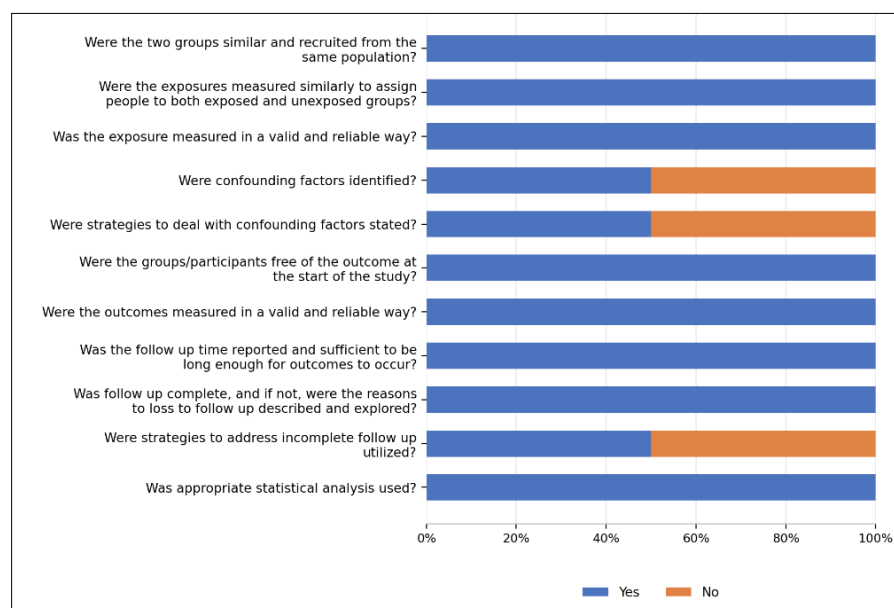


Figure 3. Risk of bias for cohort studies

The qualitative studies demonstrated consistently high methodological quality across all JBI appraisal domains, reflecting strong congruence among the stated philosophical perspective, research question, methodology, data analysis, and interpretation of findings (Figure 4). Ethical approval and adequate representation of participants' voices were also consistently reported, and overall risk of bias for this subset was low.

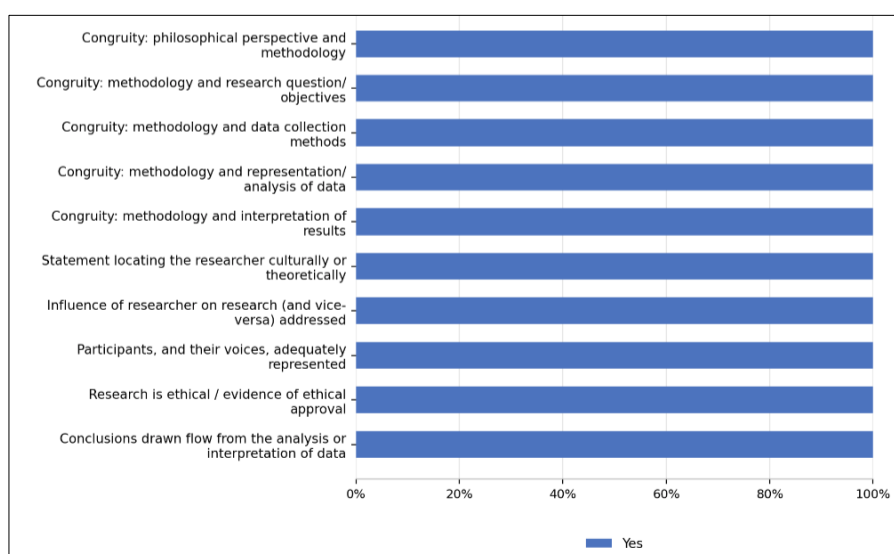


Figure 4. Risk of Bias for qualitative studies

The single scoping review included in this synthesis satisfied all JBI checklist items, reflecting a clearly defined review question, an appropriate and reproducible search strategy, and adequate methods for critical appraisal and data synthesis (Figure 5). This study was judged to be at low risk of bias. The included narrative/theoretical papers, which primarily presented foundational conceptual models of health behavior and health service utilization, also demonstrated consistently high methodological quality according to the JBI appraisal criteria (Figure 6). Each study was authored by recognized experts in the field, grounded in the extant literature, and presented logically developed arguments, supporting their classification as low-risk theoretical evidence.

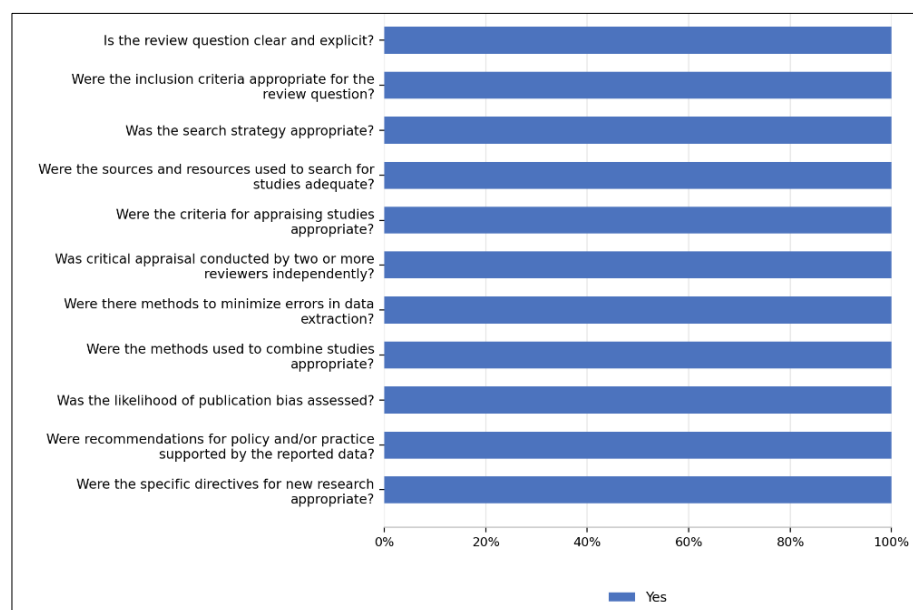


Figure 5. Risk of Bias for scoping review

Overall, despite isolated confounding-related weaknesses among the cohort and cross-sectional studies, the predominance of low-risk judgments across all designs suggests that the included studies demonstrated generally acceptable methodological rigor.

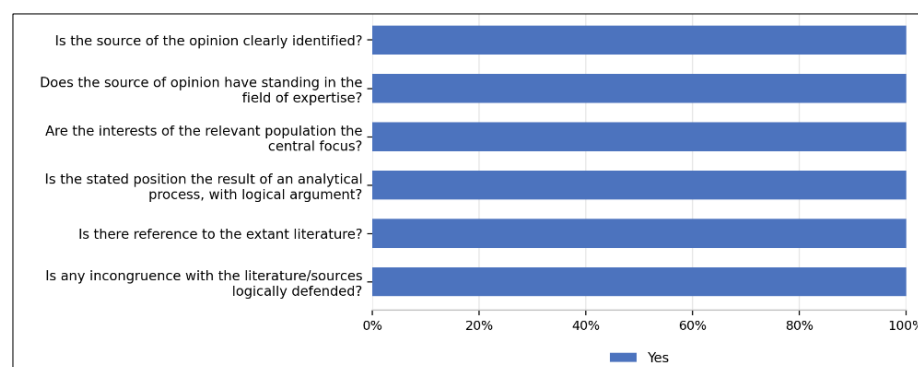


Figure 6. Risk of Bias for narrative/theoretical studies

Table 1 presents the characteristics of the studies included in the analysis. A total of 16 articles published between 1973 and 2025 included in this review, with the majority published after 2000. Most studies originated from high-income countries, particularly the U.S., followed by Canada, Australia, and several European countries. A smaller number of studies were also conducted in middle-income countries, including Brazil and India. The target populations varied widely, including adults, children (including those aged 0–5 years), older adults, migrants and humanitarian populations, individuals experiencing homelessness, rural and remote communities, women, and children and adolescents with special needs.

Table 2 presents theoretical models of dental health service utilization. Earlier studies primarily introduced foundational theoretical frameworks for health service utilization, while more recent publications focused on population-specific adaptations and the application of behavioral and access-related theories to dental health services. The included studies comprised a mix of quantitative studies, qualitative studies, and conceptual or literature-based studies. Quantitative studies were most common and typically examined associations between theoretical constructs and dental service utilization using cross-sectional or cohort designs. Qualitative studies explored care-seeking pathways, decision-making

processes, as well as perceived barriers and facilitators to dental care, contributing to the development or refinement of theoretical models. Meanwhile, conceptual and literature-based studies focused on proposing, extending, or synthesizing theoretical frameworks or behavioral models relevant to dental or general health service utilization.

The purposes of the theoretical models also varied across studies. Several models were developed to explain dental health service utilization at the population level, while others focused on specific populations, such as vulnerable groups, children, migrants, or rural communities. Some models aimed to identify predictors of utilization, while others aimed to describe care-seeking pathways, access dimensions, or behavioral determinants of dental attendance. Most studies used modified theoretical models as the bases for model development. These models drew from well-established frameworks including the Behavioral Model for Vulnerable Populations, Andersen's Behavioral Model of Health Services Use, and behavioral models such as the Theory of Planned Behavior and the Health Belief Model. A smaller number of studies proposed new or context-specific models, particularly those focusing on barriers, facilitators, and decision-making processes of migrants, rural, and region-specific populations through qualitative studies.

Across the included studies, the key components of the theoretical models could be categorized into several domains. Individual-level factors generally included demographic characteristics, health beliefs, attitudes, perceived norms, self-efficacy, perceived behavioral control, and knowledge. Enabling and structural factors encompassed dental insurance coverage, availability and accessibility of services, affordability, accommodation, workforce resources, and characteristics of the oral healthcare system. Need-related factors, both perceived and clinically evaluated, were incorporated into many models. Psychosocial factors, such as social support, parenting stress, anxiety, trust, and autonomy, were also represented. At broader levels, several models included contextual and environmental determinants, including socioeconomic factors, community resources, cultural norms, geographic context, and the policy environment.

Table 1. Characteristics of the studies included in the review

No	Author (year)	Country	Study Design	Target Population
1	Velez, et al. (2017) ²¹	USA	Qualitative (Focus Group Study)	Mexican Migrant Women
2	Grembowski, et al. (1989) ²²	USA	Narrative review	Lower-class group
3	Keboa, et al. (2019) ²³	Canada	Qualitative (Descriptive)	Humanitarian migrants
4	Nurelhuda, et al. (2021) ²⁴	Canada	Qualitative	Humanitarian migrants
5	Berat, et al. (2025) ²⁵	France	Scoping review	Children aged 0-5 years
6	Gazzaz, et al. (2022) ²⁶	USA	Cross-sectional	Children and adolescents with special health care needs (SHCN)
7	Åstrøm, et al. (2018) ²⁷	Norway	Cross-sectional	Younger adults (25-35 years old)
8	Manski, et al. (2014) ²⁸	USA	Cross-sectional	Older adults
9	Macy, et al. (2018) ²⁹	USA	Cross-sectional	Mexican-immigrant adults
10	Wiener, et al. (2024) ³⁰	USA	Qualitative (Focus Group Study)	Appalachians
11	Galvão, et al. (2023) ³¹	Brazil	Cross-sectional	Brazilians (15 years or older)
12	Chi & Leroux (2012) ³²	USA	Cross-sectional	Medicaid-enrolled children with chronic conditions
13	Aparna, et al. (2024) ³³	India	Cross-sectional	Women aged 18 years or older
14	Sukhabogi, et al. (2024) ¹⁷	India	Cross-sectional	Adults
15	Saurman, E. (2016) ³⁴	Australia	Narrative review	Rural and remote communities
16	Andersen, RM. (2008) ³⁵	USA	Narrative review	US population

Table 2. Key components of theoretical models included in the review

No	Aim	Predisposing	Enabling	Need	Others
1	To identify barriers and facilitators influencing dental care access among Mexican migrant women and their families.	Traditional Domains: Socio-Demographics, Health Beliefs, Social Structure Vulnerable Domains: Country Of Birth, Immigration Status, US Dental Care Experiences, Language Access and Literacy, Transportation and Mobility, Living Conditions	Traditional Domains: Personal and Family Resources, Community Resources Vulnerable Domains: Public Benefits, Ability to Navigate Health System, Self-Help Skills, Identified Barriers, Cost, Discrimination, Negligence and Dissatisfaction	Traditional Domains: Perceived Health Conditions, Evaluated Health Conditions Vulnerable Domains: Vulnerable Population's Health Conditions	Health Behavior: Traditional Domains (Personal Health Practices, Utilization of Dental Health Services), Vulnerable Domains (Food Sources/Diet, Hygiene) Structure: Social Class, Sociodemographic Characteristics, Insurance, Environment History: Usual Source of Care, Preventive Behavior, Quality Of Care, Oral Health Cognitive: Dental Knowledge, Dental Satisfaction, Salience of Dental Care, Perceived Norms Expectations: Expected Rewards, Expected Costs Initial Measures in Seeking Dental Care: Advice and Medication from Abroad, Seeking Non-Healthcare Provider (Family; Friends; and Community Organizations), Seeking Non-Dental Professional (Physician; Pharmacist and Social Worker), Dental Clinic/Hospital (Care Received; No Care) Initial Measures in Seeking Dental Care: Transnational Dental Care, Self-Medication, Advice and Medication from Abroad, Seeking Non-Healthcare Provider (Family; Friends; and Community Organizations), Seeking Non-Dental Professional (Physician; Pharmacist and Social Worker), Dental Clinic/Hospital (Care Received (Complete/Partial Treatment); No Care)
2	To develop a behavioral model explaining dental care use among lower-income groups.				
3	To describe the dental care pathways and experiences of humanitarian migrants				
4	To test and develop new pathways based on previous model of dental care among humanitarian migrants				

5	To develop a model that explains dental care use among children aged 0–5 years				Distal factor: Healthcare services Immediate factor: Social process/belief, Mother's medical care, Proximal factor: Child preventive medical care use, Caregiver's perception, Perception of child's oral health impact, Child oral health, Dental fear Enabling factor: Socio-demographic characteristics Special need status, Parenting stress, Social support (instrumental, emotional), Child dental care use (unmet dental needs, lack of preventive dental care) Attitude, Subjective norm, Descriptive norm, Perceived behavioral control, Intention, Action planning Modifiable preferences health beliefs: Knowledge, Perception, Taste, Attitude, Belief Modifiable market supply healthcare system: Number of providers (dental professionals), Health providers alternatives Other factors: Environment, biomedical Demographics (sex, age), Dental insurance, Dental beliefs, Past behavior, Attitude towards seeking preventive dental care, Perceived norms regarding seeking preventive dental care, Self-efficacy for seeking preventive dental care, Intention to seek preventive dental care Awareness (external information, personal contacts, social media, marketing/branding), Trust/belief, Affect (pain, depression, fear), Resources (time, finances, effort, motivation/habits), Risk perception
6	To explore the role of parental psychosocial factors in the relationship between children's SHCN and dental care use				
7	To test the TPB model augmented with dental attendance among younger adults in Norway				
8	To develop a theoretical model to explain dental health care use among older adults in U.S.	Non-modifiable predisposing: Age, Sex, Ethnicity Modifiable predisposing and enabling: Income, Wealth, Education, Marital status, Family size, Labor force status	Modifiable and interdependent enabling: Dental coverage (public/private)	Modifiable and interdependent need: Health status	
9	To use the Integrative Model of Behavioral Prediction to investigate potential risk factors for not getting regular dental checkups.				
10	To determine factors affecting decision-making in Appalachian oral healthcare				

11	To assess the use of publicly funded dental services				Demographic characteristics (sex, race/ethnic, living area), Socioeconomic position, Oral health conditions, Household enrollment in primary care
12	To identify characteristics that influence dental care use among Iowa children with chronic illnesses				County-level: Socioeconomic environment (population poverty level, unemployment), Health resource environment (dental health professional shortage area, rurality)
13	To explain factors influencing dental health care-seeking behaviour among women using the TPB model				Child-level: Age, Gender, Race/ethnicity, IDD status, Chronic condition severity, Having a sibling/caregiver enrolled in Medicaid, Use of preventive medical care Subjective norms, Attitude, Perceived behavioral control, Autonomy, Intention
14	To determine which aspects of health beliefs influence adults' dental visit behavior				Perceived susceptibility, Perceived barriers, Perceived benefits, Severity, Cues to action, Self-efficacy
15	To propose a new dimension affecting access based on Penchansky and Thomas's Theory of Access				Accessibility, Availability, Acceptability, Affordability, Adequacy, Awareness
16	To develop a new behavioral model of health service use based on the National Health Surveys	Predisposing (Contextual/Individual Characteristics): Demographic, Social, Beliefs	Enabling (Contextual Characteristics): Health policy, Financing, Organization Enabling (Individual Characteristics): Financing Organization	Need (Contextual Characteristics): Environmental, Population health indices Need (Individual Characteristics): Perceived, Evaluated	Health Behaviors: Personal health practices, Process of medical care, Use of personal health services Outcomes: Perceived health, Evaluated health, Consumer satisfaction

DISCUSSION

This scoping review presents a comprehensive summary of various theoretical frameworks that have been used to explain determinants influencing dental health service utilization, highlighting the broadness and diversity of conceptual approaches applied over more than five decades. Most research published after 2000 reflects growing awareness of oral health disparities and the importance of oral health as an integral part of overall health and health systems. Similar trends have also been observed in broader health services research, where utilization theory has expanded to incorporate behavioral, social, and structural determinants alongside traditional clinical need factors.³⁶

The range of populations represented in the included studies demonstrates the extent of contexts in which dental health service utilization theories have been applied. The application of these theoretical frameworks across a wide range of vulnerable and underserved populations reflects an important shift in dental public health research. Rather than relying on a one-size-fits-all approach, recent literature increasingly acknowledges that determinants of utilization vary substantially across different demographic and social groups.³⁷ This targeted focus underscores the necessity of context-sensitive models to identify the unique structural, cultural, and psychosocial barriers that contribute to oral health disparities among marginalized populations.

The dominance of adapted theoretical models, particularly those adapted from Andersen's Behavioral Model of Health Services Use, emphasizes the continued relevance of this framework in dental health services research.^{21,25} Consistent with findings from recent reviews in health services utilization research, Andersen-based models remain widely used due to their flexibility and capacity to integrate individual, contextual, and system-level determinants.³⁷ Specifically, in dental research, Andersen's constructs of predisposing, enabling, and need factors have been repeatedly shown to correspond with empirical patterns of dental service use and unmet dental needs.^{6,10}

Furthermore, the increasing use of behavior-centric frameworks reflects a growing scientific recognition of the psychosocial dimensions of dental care-seeking behavior. Rather than viewing access merely as a logistical issue related to clinical need or service availability, these contemporary models highlight the critical role of individual cognition, specifically attitudes, perceived norms, self-efficacy, and perceived barriers.^{17,29,33} This paradigm shift aligns with modern oral health promotion frameworks that prioritize empowering patients through cognitive and behavioral pathways alongside traditional structural improvements.^{38,39}

Access-oriented frameworks, including those building on Penchansky and Thomas's model and its later extensions, were particularly prominent in studies focusing on rural, remote, migrant, and underserved populations.³⁴ The inclusion of dimensions such as accessibility, availability, acceptability, affordability, adequacy, and awareness reflects growing recognition that access to dental care is multidimensional and shaped by both system-level and social factors.^{39,40} Recent public health literature has emphasized that failure to address these dimensions contributes to persistent oral health inequalities, even in settings with relatively well-developed dental care systems.⁴¹

Despite the wide range of models identified, the limitations of this scoping review must be explicitly acknowledged. First, a potential selection bias exists because the literature search was restricted to English-language publications, which may have excluded relevant theoretical frameworks developed in other languages. Second, a geographic data gap was identified, as the majority of included studies originated from high-income countries; this limits the generalizability of these theoretical models to low- and middle-income settings,

which often feature different oral health systems and care-seeking behaviors. Third, regarding methodological constraints, the screening and data extraction processes were primarily conducted by a single reviewer. Although potential bias was mitigated through extensive evaluations with the supervisory team, this approach may have reduced the reliability of the screening and extraction process compared with independent review by multiple reviewers. Finally, due to the inherent heterogeneity in study designs and populations, this review was not designed to directly evaluate the empirical validity or comparative performance of the models.

Overall, this scoping review highlights both the variety and fragmentation of theoretical approaches used to explain dental health service utilization. While adapted models provide conceptual continuity and comparability, there remains a need for theoretically robust, context-sensitive frameworks that better capture the complexity of dental care utilization across diverse populations and health system contexts. To address these identified gaps, future research should prioritize the empirical testing of these synthesized frameworks, specifically in low- and middle-income contexts, to validate their cross-cultural effectiveness. Furthermore, future reviews should expand their scope by incorporating multilingual searches to capture a broader global perspective, and involving multiple independent reviewers to strengthen methodological rigor.

CONCLUSION

This scoping review systematically identified and synthesized theoretical models used to explain dental health service utilization, addressing its objective of mapping existing frameworks and their key components. The findings indicate that most models are adaptations of established health service utilization theories and emphasize multilevel determinants of dental service use, while some studies proposed new models for specific context. The synthesis of these theoretical models provides a concise conceptual foundation to guide future research and support policy development aimed at improving access and equity in dental health services. Overall, this review strengthens theory-driven inquiry and contributes to advancing dental public health research and decision-making.

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