

SYSTEMATIC REVIEW

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# Oral and dental health utilization determinants in special health care needs: a systematic review of reviews

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## Abstract

**Background** Oral health is essential for overall well-being and can significantly improve quality of life. However, people with special health care needs (SHCN) often face challenges in accessing dental services. This study aimed to systematically review all available evidence on the oral and dental service utilization determinants among these individuals. Based on the findings, we also explore strategies to increase their access to dental care.

**Method** This study is a systematic review of reviews based on the PRISMA 2020. Six databases were systematically searched including PubMed, Web of Science, Scopus, Embase, ProQuest, and Cochrane Library. Related keywords were applied up to 30 October 2023. This study includes all systematic, scoping, and rapid reviews written in English that examine the factors affecting dental service use among SHCNs. Microsoft Power BI was used for descriptive quantitative analysis, and MAXQDA version 10 was applied for qualitative thematic analysis.

**Results** The number of 2238 articles were retrieved based on the search strategy. After excluding duplications and appraising the eligibility, 7 articles were included. An examination of these 7 articles shows that they were all carried out from 2016 to 2022. Of these, 42% were systematic reviews, 42% used a scoping method, and one study (14%) was a rapid review. According to the thematic analysis, there were five main themes concerning determinants of oral and dental utilization of SHCN: "Financial considerations," "Patient-Provider Relationship," "Accessibility and Availability of Services," "Patient Factors," and "Quality of Care." Additionally, regarding strategies for improving utilization, three main themes emerged: "Education and Training," "Service Improvement," and "Policy Solutions."

**Conclusion** This study delves into the intricate challenges SHCNs face in accessing dental services, highlighting the imperative for comprehensive interventions addressing supply and demand. Supply-oriented measures encompass dentist education, implementing financial policies for affordable services, and integrating dental care into primary healthcare systems. On the demand side, strategies revolve around empowering patients and caregivers and enhancing cultural inclusivity. Despite sustained efforts, current utilization rates fall short of optimal levels. Thus, effective strategic planning by policymakers and healthcare leaders is paramount to bolster dental service utilization among SHCNs, thereby enhancing their overall well-being.

**Keywords** Oral and dental health, Special health care needs, SHCN

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## Background

Oral and dental health is essential for overall well-being, enhancing quality of life and public health [1]. Good oral health allows people to eat, speak, and socialize comfortably without pain, active disease or discomfort [2]. Poor oral health can lead to lower self-esteem due to reduced interpersonal and social interactions, ultimately affecting overall welfare [3]. Notably, the prevalence of oral diseases varies across different groups based on their access to oral and dental health services [4].

In 1981, Penchansky and Thomas introduced the concept of healthcare access that includes five dimensions: availability, accessibility, affordability, acceptability, and appropriateness of services. Affordability is particularly important for dental services [5]. Many factors can influence access to dental services, such as age, gender, race, ethnicity, cost of dental treatment, health insurance, dental anxiety, oral hygiene habits, dental health education, and beliefs about oral health, as shown by various studies [6].

Today, individuals with special health care needs (SHCN) represent one of the most underserved groups in dentistry [7]. This group encompasses a diverse range of children and adults with long-term physical, developmental, mental, sensory, behavioral, cognitive, or emotional impairment or other complex conditions requiring attention and specialized healthcare [7, 8]. These conditions can arise from congenital, developmental, traumatic, or environmental factors, leading to significant limitations in daily activities [9]. SHCN affects people of all ages and social classes worldwide, though the prevalence varies by region [10].

The U.S. Census Bureau estimates that in 2021, about 12.6% of the urban population and 14.7% of the rural population reported a disability. Moreover, over one-third of adults aged sixty-five and older are severely disabled [11]. People with special health care needs (SHCN) are considered high-risk and vulnerable not only due to their disabilities but also because of societal barriers. In many communities, SHCN individuals are marginalized and have limited access to education and healthcare facilities [10]. In some countries, their healthcare needs may be entirely overlooked [12], directly impacting their overall and oral health [10].

In 1976, Nowak emphasized that “dental care represents the greatest unmet health care need for disabled individuals” [13]. A report by the American College of Surgeons highlighted significant disparities in access to dental care services for people with disabilities, noting that children and adults in this group are at greater risk of developing oral and dental diseases. The prevalence of dental caries, oral pain, gum infections, periodontal diseases, and untreated tooth decay is higher among

individuals with disabilities compared to the general population [14–16].

Given the importance of providing specialized oral and dental services to SHCN, this study aims to systematically review all available evidence on the determinants of service utilization, present coherent evidence tailored to these individuals' conditions, and subsequently examine proposed strategies to enhance their access and utilization of oral and dental services.

## Methods

### Design

The research was structured as a systematic review of reviews, following the methodology outlined by Smith et al. (2011) [17], and conducted based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).

### Identifying the question

Although the research question in systematic review studies is initially specific and clear, the research question for this study gradually evolved through a comprehensive literature review process. Our primary interest was identifying the determinants of oral and dental service utilization in SHCNs. Therefore, this study aimed to address the question: What are the determinants of oral and dental service utilization among SHCNs?

### Search strategy

Publications (up to 30 October 2023) were searched in PubMed, Web of Science, Scopus, Embase, ProQuest, and Cochrane Library. Relevant keywords were extracted using thesauri, such as MeSH and Library of Congress Subject Headings, to refine the search process. A quick search was conducted to enhance keywords and titles, abstracts, and indexes of relevant articles were examined. “Utilization,” “SHCN,” “Oral and dental health,” and “Determinants” were the primary keywords employed for the database search, with additional keywords detailed in Table 1. Boolean operators were applied to structure the search strategy, combining words within each row using “OR” and then combining rows using “AND.” Pairing rows increased search sensitivity. Subsequently, the databases were searched. Manual forward in Google Scholar and backward tracing, based on article references, was also conducted following the systematic electronic search combining the keywords. The complete search strategy for each database is provided in Appendix 1.

### Inclusion criteria and study selection

After a comprehensive systematic search, articles were first evaluated based on their titles and abstracts, followed by a thorough examination of their full texts. The inclusion criteria were that the studies be in English and

**Table 1** The search strategy of the systematic review

Concept	Description	Search term
Concept 1	Utilization	(Utilization OR Provision OR Access)
Concept 2	Special health care needs	(Special health care needs OR Complex health care needs OR Special health care patient OR Disable OR Handicapped OR Physically Disadvantage OR Vulnerable)
Concept 3	Oral and dental health	("Oral health" OR (Oral AND Health) OR (Diagnosis AND Oral) OR "Mouth Diseases" OR "Dental Health" OR "Dental care" OR (Dental AND Health) OR "Oral and dental health" OR "teeth health" OR "tooth health" OR Oral hygiene OR Oral care OR Mouth Care OR Mouth health)
Concept 4	Determinants	(Determinants OR factors OR Intervention OR Solution OR Measure OR Approach OR Strategy OR Method)

relevant to the main research question. Consequently, all English studies examining the determinants of dental service utilization in SHCN were included. In the next stage, all review articles were selected, meaning that the studies were indeed confirmed as reviews during the second phase of article examination. Articles that did not meet any of these criteria at any stage of title, abstract, and full-text review were excluded from the study. EndNote software version 20 was used for reference management and documentation of the search process.

In the initial screening, two researchers (ZZ, ZK) independently reviewed titles, narrowing the pool from 2,238 to 325 studies. After excluding irrelevant titles, the abstracts of the remaining papers were assessed by the same researchers, leading to the removal of studies that did not align with the study's objectives. Eventually, 17 full-text articles underwent further appraisal. The pre-designated researchers reviewed all 17 full texts and selected 7 for thematic analysis. Figure 1 shows the PRISMA flowchart illustrating the selection process of eligible articles.

#### Quality appraisal

The CASP checklist was employed to assess the quality of the articles included in the study. This checklist comprises ten questions divided into three categories: "validity of results," "type of results," and "applicability of results." Each question can be answered with yes, no, or can't tell, with points awarded for affirmative responses [18]. Only articles scoring 15 and above were deemed eligible for inclusion in the study. Notably, the quality evaluation of the articles was independently conducted by two reviewers. The CASP checklist and the results of the quality assessment are presented in Appendix 2.

#### Collating and summarizing the data

After extracting data from 7 eligible articles, we used Microsoft Power BI for descriptive quantitative analysis and MAXQDA version 10 for qualitative thematic analysis. Thematic analysis [19] was executed as follows:

*Familiarization* All extracted data were reviewed multiple times and compared with the original texts for better familiarization.

*Coding* Preliminary codes were identified based on the research question and the desired outcomes.

*Refining the codes* An interpretive analysis of the initial codes was conducted, organizing them into subthemes and main themes.

*Reviewing and finalizing the themes* The themes were thoroughly reviewed, allowing for their combination, refinement, separation, or elimination as needed.

*Defining and labeling* Themes and their related subthemes were defined and labeled, emphasizing content relevance.

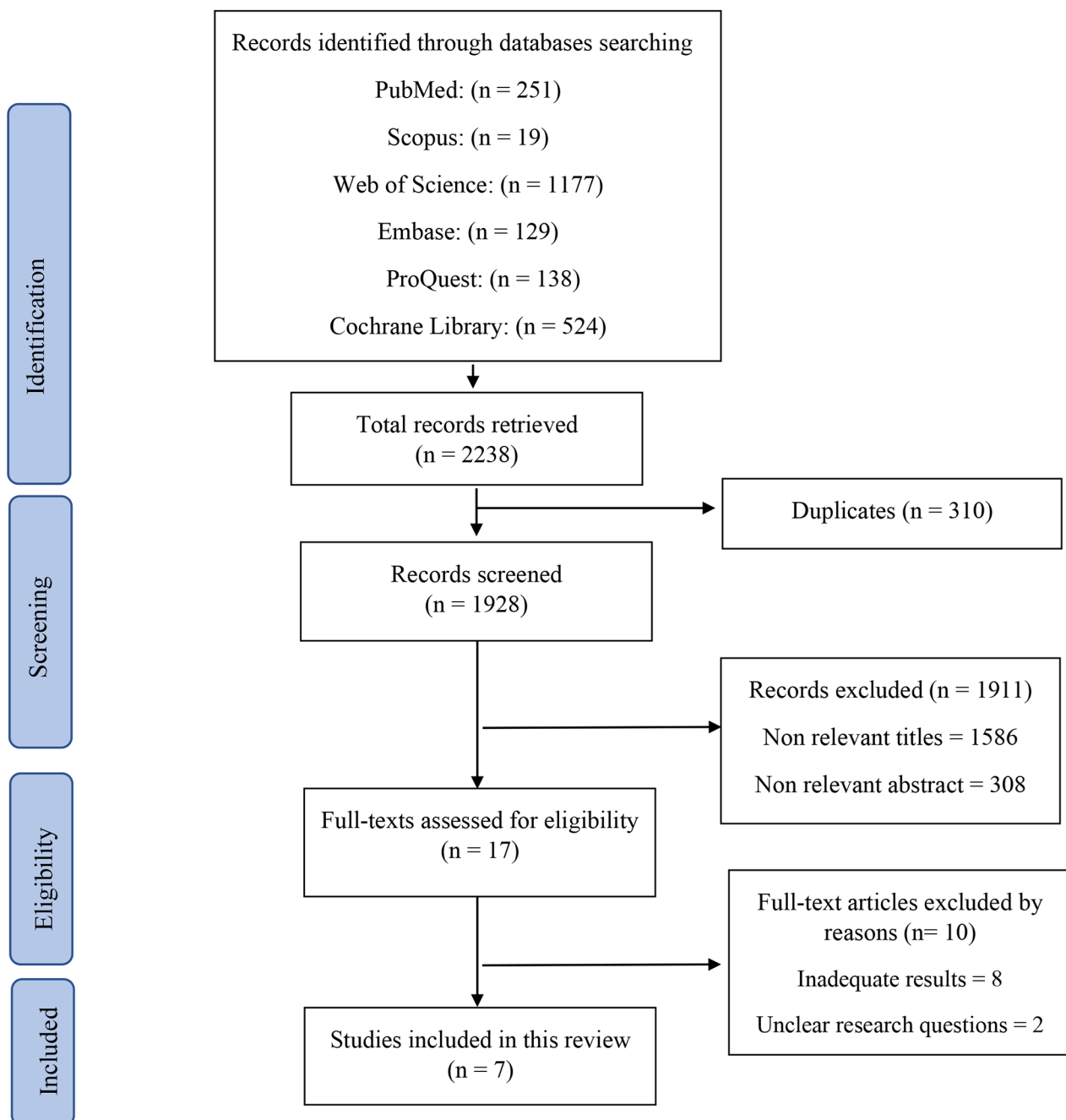
## Results

### Characteristics of the included reviews

The PRISMA flowchart indicates that 7 articles were chosen for review from 2238 studies screened in the database. A descriptive analysis of the included studies reveals that they were all conducted between 2016 and 2022. Among them, 3 (42%) were systematic reviews, 3 (42%) employed a scoping approach, and 1 (14%) was a rapid review, all focusing on the determinants of utilization of oral and dental services and barriers to accessing them. Regarding database usage, 5 (71%) studies utilized PubMed, 4 (57%) accessed Medline and Embase, while the rest utilized Scopus, Web of Science, and other databases. The number of articles included in the reviews varied from 4 to 308. Most representation stemmed from studies involving Children with Special Health Care Needs. Notably, the inclusion criteria across most studies favored published articles in English, excluding conference articles. Table 2 comprehensively summarizes the study characteristics, encompassing purpose and study type.

### Quality assessment

According to the CASP checklist rating, the highest score obtained from the articles is 20 (from 2 articles), while the lowest is 15 (from 1 article). Among the various dimensions of the checklist, the highest negative score is related to the [quality assessment](#) section of the articles, followed by the unclear definition of the research



**Fig. 1** Prisma flow diagram

question. In only two dimensions, concerning the reasonability of combining results and including all relevant articles, two assessors refrained from assigning scores and opted for the “don’t know” option. The CASP checklist and the results of the quality assessment have been presented in Appendix 2.

#### Thematic analysis

Thematic analysis of the findings unveiled five main themes concerning determinants of oral and dental

utilization of SHCN: “Financial considerations,” “Patient-Provider Relationship,” “Accessibility and Availability of Services,” “Patient Factors,” and “Quality of Care.” These themes encompassed 14 sub-themes and 34 final codes. Table 3 presents a comprehensive list of the identified themes and sub-themes. Additionally, regarding strategies for improving utilization, three main themes emerged: “Education and Training,” “Service Improvement,” and “Policy Solutions,” incorporating eight

**Table 2** Bibliographic information of included articles

Authors	Year	Research community	Design	Search period	Included articles	Inclusion criteria	Databases	Aim
Bastani et al. [10]	2022	CSHCN	Scoping review	2000–2021	56	The original English article employed a combination of quantitative and qualitative research methodologies, incorporating mixed methods. Additionally, it included viewpoints and letters to the editor.	PUBMED, SCOPUS, ISI Web of Science and PROQUEST, and EMBASE	Determinant factors affecting dental and oral services provision for Children with special health care needs
Da Rosa et al. [15]	2020	Disabilities	Systematic Review	1990–2018	16	Only observational studies (cross-sectional, cohort and case-control)	PubMed, Scopus, Web of Science, Latin American and Caribbean Health Sciences Literature (LILACS), and the Brazilian Library of Dentistry (BBO).	To provide a critical digest of the scientific literature concerning barriers and facilitators of access to oral health services for people with disabilities.
El-Yousfi et al. [20]	2019	Vulnerable groups	Rapid review	2007–2017	308	English articles	MEDLINE via Ovid	To conduct a rapid review of current literature related to barriers to oral healthcare for people from vulnerable groups
Khan et al. [21]	2022	SHCN	Systematic Review	2011–2020	21	All kinds of articles published in English	PubMed and Cochrane databases	To perform a systematic review of prior researches to identify OH care barriers and enablers for SHCN individuals.
Krishnan et al. [22]	2020	CSHCN	Systematic Review	2007–2018	4	Cohort and cross-sectional studies published in English in the last 10 years	MEDLINE, EBSCO, COCHRANE, EMBASE and Google Scholar	To assess the barriers faced by children with special needs during utilization of dental services; through caregiver's perception.
Naseem et al. [23]	2016	Learning disabilities	Scoping review	Till 2018	9	Studies published in English involving individuals over the age of 16 with learning disabilities.	Medline via OvidSP, PubMed, and EMBASE.	To identify barriers in accessing oral health care that persists within society, enabling or disabling people with learning disabilities
Ummer et al. [24]	2018	Children with intellectual and developmental disabilities	Scoping review	2000–2017	16	Original studies published in English	Medline, Embase), CINAHL, Science Direct, PubMed, Informat, Dentistry and Oral Sciences Source	To scope published studies that addressed access to dental services for children with IDD in order to determine the extent to which various barriers have been researched, using an access framework derived from the literature

sub-themes and 23 final codes, which are presented in Table 3.

### Financial considerations

Financial considerations are recognized as one of the most significant issues that prevent individuals, especially SHCN, from accessing oral and dental services. These issues can be categorized into three sub-themes: cost, repayment methods, and socioeconomic factors.

### Cost

Addressing the costs of dental care is one of the critical considerations, especially among SHCNs. This issue has been examined from two key perspectives. Findings from this study indicate that two articles highlighted the significant impact of insufficient financial support for dental services on their utilization [15, 20]. El-Yousfi et al. mentioned the limited access to SHCN due to insufficient financial support and even demonstrated through their review that 18 studies addressed this issue [20]. Additionally, among the 7 reviews analyzed in this study, 6 studies

**Table 3** Oral and Dental services utilization determinants

Themes	Sub-themes	Final code	References
Financial considerations	Cost	Inadequate financial support for dental care	[15, 20]
		High cost of dental	[10, 15, 20–22, 24]
	Repayment methods	Nonpaid services and reimbursement by insurance systems	[15, 24]
		Inadequate insurance coverage	[10, 24]
	Socioeconomic factors	Patients' socioeconomic status	[10, 20]
Patient-Provider Relationship	Perceptions and Attitudes	Negative perceptions and attitudes of healthcare providers	[10, 15, 21–24]
		Patients' negative perceptions and attitudes toward providers	[20, 22]
	Communication	Psychological response	[10, 15, 21]
		Insufficient knowledge and experience of providers in establishing communication	[10, 15, 20, 21, 24]
		Challenges in patient-provider communication	[15]
	Behavior support	Poor providers' attention to behavior management	[21, 24]
		Uncooperative patients	[15, 21, 24]
Accessibility and Availability of Services	Accessibility challenges	Inappropriate working hours of healthcare facilities	[15, 20, 22, 24]
		Long waiting time	[15, 20, 22, 24]
		Difficulty in scheduling appointments	[15, 20]
		Transportation challenges	[15, 20–22, 24]
			Insufficient accessibility to dental facilities
	Workforce	Insufficient enthusiastic and skilled dentists	[10, 15, 21, 22, 24]
Patient Factors	Sociocultural factors	Ethnic and racial differences	[21]
		Families shape	[22]
	Caregiver Factors	Lack of health literacy and awareness among individuals, families, and caregivers	[20, 21, 23, 24]
		Family limitations in accompanying children	[15, 20, 24]
		Low parental demand for care	[21]
	Contextual factors	Underlying medical conditions	[21, 22]
		Dental anxiety	[15, 20–24]
		Failure to seek treatment for very young children	[15]
Quality of Care	Evidence-based service	Lack of evidence-based, comprehensive need assessment policies	[10, 20, 21]
		Inaccurate needs assessment (unmet needs and others)	[10, 15]
	Services provision	Inadequate service provision	[15, 20, 21, 23, 24]
		Provision of unnecessary care to patients	[15]
		Medical restrictions to use continuous general anesthesia	[15, 24]
	Managerial factors	Inadequate training for providers	[15, 22, 24]
Lack of integration of oral health into primary care		[10, 20, 21, 23]	
Administrative limitations and referral system issues		[10, 20, 21]	

referred to the issue of high costs of dental services. They showed that increased costs, particularly for specialized treatments essential for individuals with special needs, can hinder timely access to dental care [10, 15, 20–22, 24].

#### **Repayment methods**

During the articles review, two studies by da Rosa and Ummer pointed out the lack of timely and sufficient repayment and financial deficits that can significantly impede access to dental services [15, 24]. Insufficient insurance coverage for various dental methods for SHCN is considered a determining factor that Bastani and Ummer demonstrated can disrupt access to dental services for this group [10, 24].

#### **Socio-economic factors**

Thematic analysis results indicate that socio-economic status significantly affects the use of dental services. Findings from two studies show that socio-economic backgrounds may hinder individuals' access to dental services or reduce access levels by influencing individuals' prioritization of needs [10, 20]. In Bastani's review study, two studies also addressed this issue. They showed that the social and economic status of the family with CSHCN entirely caused their poor oral and dental health [10].

#### **Patient-provider relationship**

The theme of the relationship between patients and healthcare providers refers to a set of topics indicating the importance of this relationship and its impact on the utilization of oral and dental services. This relationship

can be examined through perceptions, attitudes, communications, and behavioral support.

#### **Perceptions and attitudes**

Perceptions and attitudes can be examined from the perspective of healthcare providers and patients. Findings from reviewed articles indicate that 6 studies addressed negative perceptions and attitudes among healthcare providers, which can significantly hinder individuals from benefiting from effective care [10, 15, 21–24]. Among these, only two articles similarly addressed patients' negative perceptions and attitudes towards their providers, suggesting that such perceptions can create obstacles in establishing a trust-based relationship crucial for effective care [20, 22]. It is worth mentioning that despite only two studies addressing this issue, 18 studies included in El-Yousfi et al.'s article emphasized this topic [20].

#### **Communication**

Effective patient-provider communication is crucial. In this regard, Bastani, da Rosa, and Khan demonstrated that patients' psychological responses, such as fear, anxiety, or mistrust towards their providers, can significantly impact communications [10, 15, 21]. Providers' poor communication skills and inadequate experience in effectively communicating with SHCN can also lead to misunderstandings and missed opportunities for effective treatment [10, 15, 20, 21, 24]. Among these, only da Rosa and colleagues addressed the existing challenges in patient-provider communication, such as language barriers, cultural differences, or complexity in information transfer, as significant obstacles to achieving effective communication [15].

#### **Behavior support**

Behavior support is also vital in providing oral and dental care to individuals with SHCN. Analysis results have shown that providers' insufficient attention to behavior support strategies impacts their utilization levels [21, 24]. Additionally, patient non-cooperation due to reasons such as fear, misunderstanding, or lack of expectation comprehension is another aspect highlighted in Khan et al.'s study through four examined articles [21]. Furthermore, two studies by da Rosa and Ummer addressed this issue and its impact on behavior support [15, 24].

#### **Accessibility and availability of services**

This theme explores the level of access and availability of oral and dental services for groups with special needs. It considers factors such as physical access to dental facilities and skilled and enthusiastic workforce availability.

#### **Accessibility challenges**

This subtheme addresses various obstacles that SHCNs may encounter when seeking access to dental services. Analyses indicate that four studies have addressed inappropriate working hours at dental care centers as a potential physical barrier complicating access to dental services for specific individuals [15, 20, 22, 24]. Among accessibility challenges, 15 studies mentioned long waiting times for dental services in El-Yousfi's review article. This issue has also been examined as one of the most significant accessibility challenges in studies by da Rosa, Krishnan, and Ummer [15, 20, 22, 24]. Additionally, challenges patients face in scheduling appointments [15, 20] and inadequate access to dental facilities, such as the absence of manual ramps or suitable sanitation services for this group [15, 20, 22, 24], can hinder individuals with SHCN from accessing dental services. Five studies have examined issues related to transporting individuals with SHCN to service provider centers as one of the restricting factors for individuals' access to dental services [15, 20–22, 24].

#### **Workforce**

This subtheme highlights the shortage of qualified and motivated dentists for treating special needs groups. Thematic analysis results have shown that five studies indicated the impact of the lack of skilled specialists on the quality of dental care provided and posed a challenge to the utilization of dental services [10, 15, 20, 21, 24].

#### **Patient factors**

This theme explores various patient-related factors that can influence the utilization of oral and dental services and access to dental care. These factors are divided into sociocultural, caregiver, and contextual factors.

#### **Sociocultural factors**

This subtheme examines the social and cultural aspects that may impact patients' dental health and their utilization of dental services. Ethnic and racial disparities in the utilization of dental services were addressed as a subject that only emerged in Khan et al.'s study as influential factors [21]. Family structure, including the number of children, the presence of elderly family members, and the dynamics of single-parent or two-parent families, was also examined in Krishnan's study [22].

#### **Caregiver factors**

This subtheme also emphasizes the influence of parents or caregivers on the utilization of dental services. Study findings have shown that four studies have mentioned the lack of health literacy and awareness among individuals, families, and caregivers [20, 21, 23, 24]. Additionally, family constraints on accompanying children to receive

services and attend dental visits were other issues mentioned in the articles. In this regard, da Rosa referred to inflexibility in the workplace environment and the difficulty of taking leave to accompany children [15]. Ummer also highlighted the time-consuming nature of children's service receipt, which does not allow parents to coordinate work environments and receive services [24]. El-Yousfi also mentioned some family's challenges in supporting their children during dental visits [20]. One study also identified low parental demand for dental care as a family-related factor affecting access to dental services [21].

#### **Contextual factors**

This subtheme examines a broader environment in which patients live and background factors that can impact the oral health of SHCN. Reviewed articles indicated that medical conditions related to the context [21, 22] and failure to seek treatment for very young children [15] can be determining factors in the utilization of dental services. Also, findings from five studies highlight the issue of dental anxiety among patients, indicating the fear or stress that some individuals may experience during dental appointments [15, 20–24].

#### **Quality of care**

The quality-of-care theme encapsulates the standard of healthcare services provided to patients. It is a multidimensional concept that incorporates various aspects of healthcare, including the nature of services delivered, healthcare providers' competence, and organizational management's effectiveness.

#### **Evidence-based service**

Evidence-based service highlights two key issues as significant barriers in this field: literature review indicates the absence of comprehensive, evidence-based needs assessment policies ensuring the provision of services based on significant health needs [10, 20, 21], and inaccurate needs assessments that point to a lack of precision in evaluating patient needs, potentially leading to unmet needs and the provision of inappropriate or unnecessary services [10, 15], are influential factors in the lower utilization of dental services by SHCN.

#### **Services provision**

The subtheme of service provision refers to various challenges that deter SHCN from receiving effective services. In this regard, 4 reviews mentioned insufficient service provision and untreated patients [15, 20, 21, 23, 24]. Which, along with the potential provision of unnecessary care to patients, leads to resource waste and potential harm [15]. Another limiting barrier to accessing dental services is the issues individuals with special needs may

experience with continuous general anesthesia during dental procedures, which poses a barrier for those requiring pain management during dental treatments [15, 24].

#### **Managerial factors**

Managerial factors refer to administrative aspects of healthcare provision. Insufficient training of providers [15, 22, 24], the gap in integrating oral health into primary care [10, 20, 21, 23] are notable issues in this domain. On the other hand, administrative constraints and issues related to the referral system point to administrative challenges, which have created challenges for the continuous provision of dental services [10, 20, 21].

Following the conducted analyses, an attempt was made to depict the determinants of utilization of dental services in SHCNs into two groups: factors related to providers and policymakers, and factors related to patients. As illustrated in Fig. 2, the majority of factors are associated with providers. (Fig. 2)

Continuing the thematic analysis, strategies to improve utilizing oral and dental services in SHCNs were also examined (Table 4).

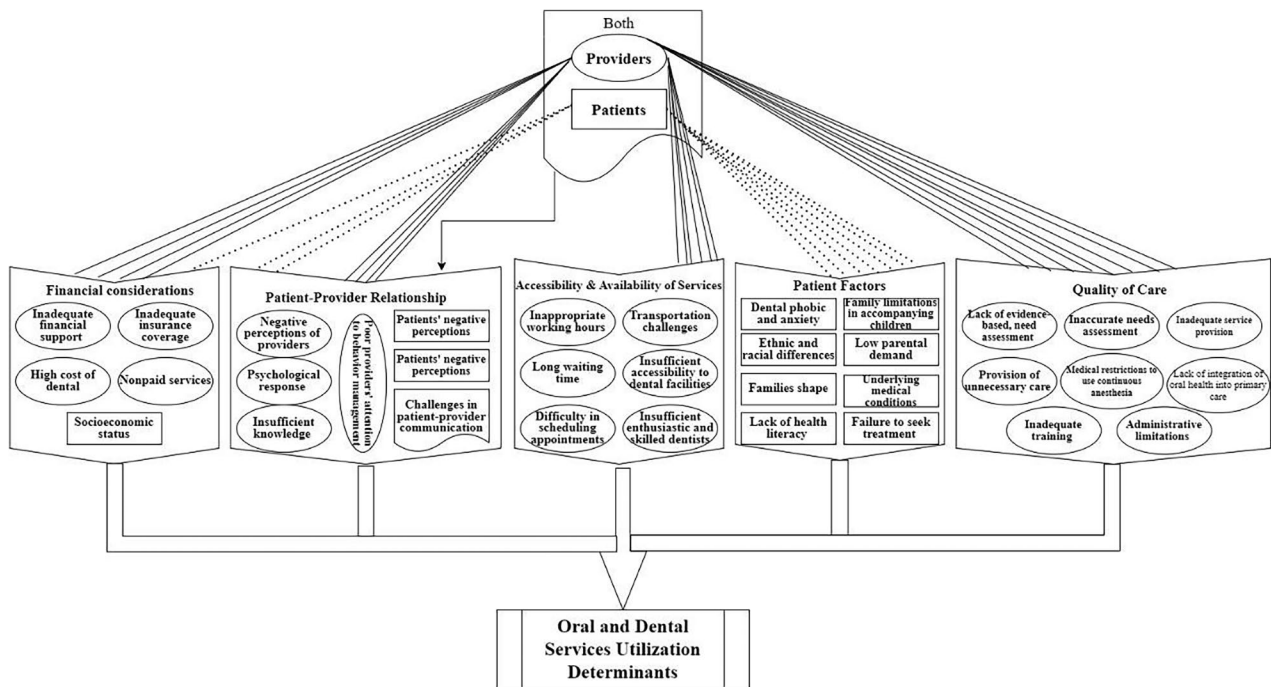
#### **Education and training**

The "Education and training" theme involves the need for continuous learning and empowerment in the dental care sector. This theme is divided into two critical sub-themes: "Dental Education" and "Patient Empowerment." Among the strategies identified in these two sub-themes, "Improving dental education programs and shifting their focus toward experiential learning," "Empowering dentists with specialized skills and knowledge," and "Empowering SHCNs, their parents, and caregivers" were considered as some of the most crucial strategies for improving the utilization of oral and dental services for SHCNs in three articles [10, 20, 21].

#### **Service improvement**

The main theme, "Service Improvement," emphasizes the need for continuous enhancement in providing and managing healthcare services. This theme is divided into three crucial sub-themes: "Infrastructure and Services Management," "Coordination," and "Preventive Measures and Guidelines". The reviews showed that "Increasing interdepartmental coordination" [10, 21] and "Promoting preventive measures" [10, 15] are recognized as important strategies in the articles for utilizing various departments and teams in providing services to this group, as well as empowering individuals in self-care. Additionally, a "Centralized, comprehensive preventive healthcare system" was emphasized in three studies [10, 20, 21].





**Fig. 2** Thematic map of oral and dental utilization determinants

**Table 4** Strategies for improving oral and dental utilization

Themes	Sub-themes	Final code	References
Education and training	Dental Education	Improving dental education programs and shifting their focus toward experiential learning	[10, 20, 21]
		Empowering dentists with specialized skills and knowledge	[10, 20, 21]
		Integrating oral health education into nursing curricula	[10, 20]
		Training sign language to providers	[10]
		Enhancing dentists' attitudes	[10, 21]
Service Improvement	Patient Empowerment	Empowering SHCN, their parents, and caregivers	[10, 20, 21]
		Enhancing cultural access	[10]
	Infrastructure and services management	Providing services with greater improvement or timely referrals	[10]
		Creating a calm and suitable environment in dental clinics	[10]
		Establishing suitable clinics for SHCN	[21]
	Coordination	Increasing interdepartmental coordination	[10, 21]
		Multi-disciplinary team activities	[10]
Preventive Measures and Guidelines	Improving community-based service delivery	[10]	
	Centralized, comprehensive preventive healthcare system	[10, 20, 21]	
	Developing clinical guidelines and clinical pathways	[20]	
Policy solutions	Financial Policies	Promoting preventive measures	[10, 15]
		Implementing an appropriate reimbursement system with additional payments for providers	[10]
		Providing cost-effective care	[21]
	Accessibility factors	Expanding health insurance coverage	[10]
		Paying attention to accessible healthcare system facilities and resources	[10]
Resource management	Locally tailored policy-making	[10, 20]	
	Utilizing appropriate technologies	[21]	
	Establishing an active dental department for SHCN	[23]	

### Policy solutions

The “Policy Solutions” theme refers to actions and solutions undertaken in the financial, accessibility, and resource management domains to address issues related to the SHCNs’ utilization of dental services. According to thematic analysis, locally tailored policymaking, designed specifically to address the unique needs and challenges of local healthcare communities, is a noteworthy approach [10, 20].

### Discussion

The present study aims to explore the factors influencing the utilization of dental services among individuals with SHCN and identify strategies for improvement through thematic analysis. The themes obtained provide a comprehensive framework for understanding the multifaceted nature of dental services utilization, highlighting potential areas for enhancement.

Among the factors influencing the utilization of oral and dental services among SHCN individuals, six were frequently mentioned: high cost of dental care, negative perceptions and attitudes of healthcare providers, lack of communication skills and experience among providers, transportation challenges, shortage of enthusiastic and skilled dentists, and dental anxiety.

Dental services are generally considered expensive, and in some countries, they contribute to households facing catastrophic health expenditures and avoiding these services [25–27]. This issue is particularly severe for households with an SHCN member, as their higher health costs are often unaffordable. Lindley et al. (2010) showed that households with an SHCN child are 200% or more below the poverty line [28], resulting in these households falling into the poverty trap of illness. Obeidat et al. (2022) also demonstrated that poverty and lack of insurance are major factors contributing to unmet oral healthcare needs in children with developmental disorders compared to other children [29]. Financial support strategies could help mitigate this issue.

Strategies such as implementing an appreciative and fair reimbursement system [10], providing cost-effective care [21], and increasing insurance coverage [10] were emphasized in this study.

These measures aim to reduce financial barriers and improve access to oral and dental services for SHCN individuals. The importance of financial support and increased insurance coverage for SHCNs was also confirmed in other studies [30]. Newacheck et al. also demonstrated that increasing insurance coverage is one of the main reasons for the improved utilization of health care among SHCN individuals [31].

According to the findings of this study, another significant factor affecting the use of dental services among SHCN patients is the negative perceptions and attitudes

of healthcare providers. This issue may stem from providers’ lack of communication skills and experience, leading to misunderstandings and feelings of unfamiliarity [32]. This barrier hinders effective communication and trust between the patient and the provider [33]. Furthermore, insufficient knowledge of providers may result in the delivery of incorrect information and a lack of trust, discouraging patients from seeking necessary care or continuing recommended treatments [32]. Alumran et al. also showed that negative attitudes of dentists can significantly affect the quality of dental care provided to SHCNs [8], with reduced quality of services being a factor for non-utilization. This underscores the importance of enhancing communication strategies to ensure effective patient-provider interactions for SHCNs.

According to this study, hands-on training, simulations, or real-life experiences for providers—what we call experiential learning—and empowering dentists with specialized skills are crucial strategies for overcoming barriers in providing dental care to SHCN individuals [10, 20, 21]. Experiential learning helps providers better understand and meet the unique needs of SHCNs, while specialized skills training equips dentists with specific treatment methods, knowledge about these patients’ needs, and awareness of the latest research and best practices in the field. A study by Lim et al. also showed that specialized consultation for dentists increases their willingness to care for SHCN patients, ensuring these individuals receive timely and appropriate care [34].

Not empowering dentists with specialized skills can lead to a shortage of enthusiastic and skilled dentists, creating an extra hurdle for SHCN individuals in getting oral and dental services. Providing dental care for these individuals requires specialized knowledge, increased awareness, and adaptive measures beyond standard care [7]. The absence of such providers can exacerbate health disparities and unmet needs among these individuals, ultimately challenging their access to oral and dental services. Paisi et al. also demonstrated that the lack of dentist preparedness to assist people with disabilities can restrict access to dental services [35].

In the realm of oral and dental care, transportation challenges can pose significant barriers to accessing essential services for SHCNs. These challenges may include a lack of suitable transportation, long distances to care facilities, and inadequate facilities for entering centers, all of which can lead to delays or missed appointments, create additional burdens beyond those faced by ordinary individuals, and generate psychological stress and anxiety for SHCNs, their families, and caregivers. These factors can all contribute to an individual’s decision not to use services and ultimately reduce the utilization of oral and dental services by these individuals. In this regard, paying attention to accessible healthcare system

facilities and resources [10] is one of the initiatives highlighted in this study to create suitable facilities for reducing burdens and psychological stress and to provide opportunities for accessing the intended services. Syed et al. also emphasized that transportation barriers are a significant obstacle to accessing healthcare, especially for those with lower incomes or uninsured individuals [36].

Dental anxiety presents another significant obstacle for SHCN patients in accessing dental services. This issue is common among the general population as well, hindering the pursuit and receipt of essential dental care [37, 38]. SHCN individuals may exhibit heightened levels of anxiety compared to those without disabilities, often due to sensory sensitivities and past negative experiences. These factors can impact the frequency of dental visits and consequently, oral health outcomes. Additionally, the communication challenges highlighted in the study also contribute to dental anxiety. Therefore, creating a calm and suitable environment in dental clinics, along with efforts to improve communication, can aid in controlling and managing this anxiety.

In subsequent studies, additional factors such as inadequate service provision, lack of integration of oral health into primary care, lack of health literacy, insufficient accessibility to dental facilities, long waiting times, and inappropriate working hours were recognized as key determinants of dental service utilization among SHCN individuals.

### Strengths and limitations

This study has several limitations. One limitation is associated with the qualitative assessment tools used for articles. The exclusion of some articles using the CASP tool suggests that using an alternative tool might have included more articles, potentially influencing the results differently. In addition, our study encompasses a broad range of individuals with SHCN. While this comprehensive approach adds value to categorizing various factors influencing dental service utilization in a group with significant needs often overlooked, it also means we couldn't delve into specific barriers unique to each subgroup within the SHCN population. However, our study does provide potential strategies to address these challenges, enhancing the comprehensiveness of this work and providing practical insights for policymakers and healthcare providers.

### Conclusion

Numerous factors influence the utilization of dental services among SHCN individuals. These factors can be categorized into two main groups: barriers from service providers and policymakers, and demand-side obstacles. Essential interventions have been identified to overcome these barriers. The policies adopted in this area can

significantly impact both the supply and demand sides. Therefore, the Ministries of Health, in their role as health stewards, should modify and implement effective policies in this field.

### Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12903-024-04734-4>.

Supplementary Material 1

Supplementary Material 2

Supplementary Material 3

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Not Applicable.

### Author contributions

Conceptualization: ZZ, ZKData curation: ZZ, ZKFormal analysis: ZZ, ZKMethodology: ZZProject administration: ZKSupervision: ZK, MHB, PBWriting – original draft: ZZ, MHB, PB, ZKWriting – review & editing: ZZ, MHB, PB, ZK. All authors read and approved the final manuscript.

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### Data availability

All data generated or analyzed during this study are included in this published article.

### Declarations

#### Ethics approval and consent to participate

This study received ethical approval from the ethics committee of Shiraz University of Medical Sciences with ID number IR.SUMS.NUMIMG.REC.1401.082.

#### Consent for publication

Not applicable.

#### Competing interests

The authors declare no competing interests.

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