Universidad Europea

GRADUATION PROJECT

Degree in Dentistry

GLOBAL INEQUALITIES IN ORAL HEALTH: A COMPARATIVE STUDY OF PREVENTIVE STRATEGIES AND OUTCOMES ACROSS COUNTRIES WITH DIFFERENT HEALTH SYSTEMS

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RESUMEN

Introducción: Las enfermedades orales se encuentran entre los problemas de salud pública más prevalentes a nivel mundial y afectan de manera desproporcionada a las poblaciones con menor nivel socioeconómico. Estas desigualdades están relacionadas con diferencias en el acceso a los servicios preventivos, la organización de los sistemas de salud bucodental y las políticas públicas nacionales. Comprender cómo los distintos modelos de atención en salud oral influyen en los resultados es esencial para abordar las disparidades globales; **Objetivos**: El objetivo principal fue analizar y comparar los sistemas de atención en salud bucodental entre diferentes países y evaluar su relación con las desigualdades en los resultados de salud oral. Un objetivo secundario fue identificar las estrategias preventivas implementadas a nivel internacional y evaluar su influencia en los indicadores de enfermedades orales; **Metodología**: Se realizó un estudio descriptivo y comparativo utilizando datos secundarios de bases de datos internacionales, incluyendo el Oral Health Country/Area Profile Project, la Organización Mundial de la Salud y la Federación Dental Internacional, junto con literatura científica relevante. Se analizaron indicadores epidemiológicos como el índice CAOD (dientes cariados, ausentes y obturados) a los 12 años, la prevalencia de periodontitis y edentulismo, la cobertura de atención odontológica, los indicadores económicos y los programas preventivos; **Resultados**: Los resultados mostraron variaciones significativas en los indicadores de salud oral entre países. Los sistemas con mayor cobertura pública y estrategias preventivas estructuradas presentaron niveles más bajos de caries, mientras que los sistemas predominantemente financiados de forma privada mostraron mayores tasas de enfermedad no tratada. Factores socioeconómicos y preventivos, como el consumo de azúcar, las políticas de fluoración y la disponibilidad de profesionales, también influyeron en los resultados; **Conclusiones**: Los sistemas de salud bucodental orientados a la prevención y accesibles se asocian con mejores resultados y una reducción de las desigualdades, lo que resalta la importancia de la inversión pública y la prevención universal.

PALABRAS CLAVE

Odontología, Sistema de salud oral, Prevención, Desigualdades.

ABSTRACT

Introduction: Oral diseases are among the most prevalent global public health challenges and disproportionately affect populations with lower socioeconomic status. These inequalities are linked to differences in access to preventive services, the organisation of oral health systems, and national public health policies. Understanding how various oral health care models influence outcomes is essential to addressing global disparities; **Objectives:** The primary objective was to analyse and compare oral health care systems across countries and assess their relationship with inequalities in oral health outcomes. A secondary objective was to identify preventive strategies implemented internationally and evaluate their influence on oral disease indicators; **Material and Methods:** A descriptive comparative study was conducted using secondary data from international databases, including the Oral Health Country/Area Profile Project, the World Health Organization, and the International Dental Federation, together with relevant scientific literature. Epidemiological indicators such as DMFT (decayed, missing, filled teeth) at 12 years, prevalence of periodontitis and edentulism, dental care coverage, economic indicators, and preventive programmes were collected and organised into comparative tables; **Results:** Findings revealed significant variations in oral health indicators across countries. Systems with broader public coverage and structured preventive strategies showed lower caries levels, whereas predominantly privately funded systems exhibited higher rates of untreated disease. Socioeconomic and preventive factors such as sugar consumption, fluoridation policies, and availability of dental professionals also influenced outcomes; **Conclusions:** Preventive-oriented and accessible oral health systems are associated with improved outcomes and reduced inequalities, highlighting the importance of public investment and universal prevention.

KEYWORDS

Dentistry, Oral health systems, Prevention, Inequalities.

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1. INTRODUCTION

1.1 Importance of oral health

Oral health is a fundamental component of general health and well-being (1). The Word Dental Federation (FDI) defines it as a multidimensional state that extends the absence of disease or pain, encompassing the ability to speak, smile, taste, chew, and express emotions with confidence (2). A healthy mouth contributes directly to physical health, psychosocial well-being, and social functioning; therefore, oral health is closely linked to overall quality of life, daily functioning, and long-term well-being (3).

1.2 The global burden of oral diseases

Bernabe *et al*. reported in 2020 that nearly half of the world's population (approximately 3.5 billion people) experience oral diseases at some point in their lives, including around 2.3 billion affected by untreated dental caries (4). Despite significant advances in dental care, caries remains one of the most prevalent non-communicable diseases worldwide (5). It is a multifactorial condition resulting from an imbalance between the tooth surface, bacterial biofilm, and sugar consumption. Over time, bacteria metabolise dietary sugars and produce acids that demineralise enamel. This process can be arrested, or even reversed, when treated early; however, once cavitation occurs, treatment becomes more complex and irreversible (6). Most contributing factors are modifiable, including reducing daily sugar intake, ensuring adequate fluoride exposure, and maintaining effective oral hygiene practices to limit biofilm accumulation (7).

Globally, periodontal diseases also represent a major public health concern. Nascimento *et al*. estimated that more than one billion people develop severe periodontitis during their lifetime, and 353 million individuals are edentulous worldwide (8). Periodontal disease often begins as gingivitis, a chronic and reversible inflammatory condition affecting the gingiva, but it may progress to periodontitis, a destructive disease characterised by loss of soft tissue and alveolar bone, affecting roughly 15% of the population (9). Its development results from the interaction of pathogenic bacteria with risks factors, including tobacco use, unhealthy dietary habits, stress, genetic predisposition, excessive alcohol consumption, and systemic conditions such as diabetes and cardiovascular disease (10). As with dental caries, periodontal diseases

often progress unnoticed by patients and can be effectively prevented through appropriate oral hygiene and preventive measures (11).

Although most oral diseases are preventable (12), they continue to affect billions of people worldwide. Recent global trends suggest a decline in dental caries in some populations alongside an increase in other chronic oral conditions, suggesting a shift in the global oral health burden (13).

1.3 Inequalities in oral health

The FDI estimates that approximately 2.4 billion people worldwide have little to no access to oral disease prevention, care, or treatment (14). Oral health inequalities are defined as avoidable, unjust, and unfair differences in health outcomes between population groups. Despite global progress, disparities in access to dental care persist, largely driven by social determinants of health. In 2008, the World Health Organization (WHO) highlighted that these inequalities arise from conditions in with individuals are born, grow, live, work, and age (15). Consequently, oral diseases represent a significant public health burden that disproportionately affects socioeconomically disadvantaged and marginalized populations and is closely associated with broader social and economic factors. For example, the prevalence of dental caries is significantly higher among low-income groups (16).

In disadvantaged settings, individuals are more likely to consume products with high refined sugar content (17). Marketing strategies by private companies frequently target lower-middle-income countries, as well as vulnerable communities, by promoting products such as tobacco, alcohol, sweets, and sugary-sweetened beverages (17). Families living in poverty often face financial barriers that limit access to dental care. Poor oral health may, in turn, worsen general health and contribute to a cycle of vulnerability that reinforces existing social and health inequalities (17,18).

1.4 The role of oral health care systems

Oral health care systems are organised structures encompassing activities aimed at promoting, restoring, and maintaining the oral health of individuals and populations, including addressing the needs of people with disabilities. These systems are influenced by factors such as socio-economic development, political context, cultural norms, demographics characteristics, population needs, and the availability of dental personnel (19). Models of care vary widely

across countries (20), and governments allocate resources according to national priorities while defining strategies for oral disease prevention and health promotion (21).

Although oral health care systems show considerable diversity, they are commonly grouped into three main models based on their organization and financing mechanisms: private systems, social security system (also referred to as mixed models), and state system. Beyond these general models, many countries implement targeted programmes for priority or vulnerable groups, such as children, older adults, low-income populations, migrants, and people with disabilities, to address specific oral health needs and reduce inequalities (21,22). A brief description of these three models is presented below:

- Private system: Dental care is entirely financed by patients through out-of-pocket payments or private insurance schemes (19,23–25). Dentists usually practice in privately owned clinics, and patients have full freedom to choose their provider. However, this model often favours individuals with higher socioeconomic status, as treatment cost can represent a significant barrier for disadvantaged populations. Consequently, access to care tends to be uneven, and oral health inequalities are more pronounced in predominantly private systems.
- Social security system: This model is financed through collective funding mechanisms, such as social contributions or general taxation (19,23–25). Although most services are provided in private practices, the cost of care is partially or fully reimbursed by the state or insurance organizations. This system improves access to essential dental services for a larger proportion of the population; however, increased demand combined with limited public resources may result in waiting times, coverage gaps, or restrictions for certain procedures.
- State system: In this model, dental care is fully publicly funded and covered by governmental budgets. Dentists work in public clinics or health centres and receive fixed salaries (19,23–25). Access to care is universal and often prioritises vulnerable groups, thereby reducing financial barriers and promoting equity. Nevertheless, state-funded systems may face challenges such as long waiting lists, resource limitations, and reduced patient choice.

1.5 Justification

Oral health inequalities remain a major global public health challenge, even though most oral diseases are largely preventable. These inequalities are strongly influenced by differences in organization of oral health care systems, access to preventive services, and the implementation of public health policies across countries. As a result, vulnerable and socioeconomically disadvantaged populations experience a disproportionate burden of untreated disease and limited access to essential dental care.

Understanding how oral health care systems are organized and how preventive strategies are implemented in different national contexts is essential for explaining the observed variations in oral health outcomes and levels of inequalities. By comparatively analysing oral health care systems and preventive approaches across countries, this study aims to explore the relationship between health system organisation, preventive measures, and inequalities in oral health outcomes. The findings of this analysis may support evidenced-informed public health decision-making and contribute to the development of more equitable and effective global oral health policies at a global level.

2. OBJECTIVE

2.1 Principal objective

To analyse and compare different oral health care systems across countries worldwide and examine their relationship with inequalities in oral health outcomes.

2.2 Secondary objective

To identify the preventive strategies implemented by different countries and explore their potential role in reducing oral health inequalities.

3. MATERIAL AND METHODS

3.1 Elaboration of the PICO question

This study was designed to answer the following research question:

- Among populations from different countries with varying socioeconomic conditions, how are different oral health care systems associated with inequalities in oral health outcomes?

This question was structured using the PICO framework:

- P (Population): general population across countries worldwide.
- I (Intervention): oral health care systems.
- C (Comparison): different type of oral health care systems and prevention actions.
- O (Outcome): inequalities in oral health outcomes.

3.2 Type and design of the study

This work was conducted as a descriptive and comparative study aimed at analysing global oral health inequalities in relation to different oral health care systems and preventive strategies. A data-based approach was used to explore patterns and relationships between systems characteristics and epidemiological indicators across countries.

3.3 Sample size

The unit of analysis was the country, each representing different oral health care models (public, private, mixed systems), different income levels (low, middle and high income), and various geographical regions. No sampling calculation was performed, as the study was based on available secondary data.

3.4 Data sources and search

Data were obtained from the WHO Global Oral Health Status Report and Oral Health Country/Area Profile Project (CAPP), which provided indicators such as DMFT[1] at age 12, the percentage of periodontitis, prevalence of edentulism, https://mau.se/en/about-us/faculties-and-departments/faculty-of-odontology/oral-health-countryarea-profile-project--capp/.
Additional information was retrieved from the FDI, the OECD, the World Bank and scientific

[1] DMFT average for Decayed, Missing and filled teeth.

literature indexed in PubMed, Scopus, and Web of Science regarding oral health systems, dental coverage, GDP per capita, national expenditure on dental care, and preventive strategies (24,26,27).

3.5 Inclusion criteria

Countries were included if they met the following criteria:

- Availability of oral health indicators through CAPP (Malmö University).
- Complementary data available from other reliable international databases (e.g., PubMed, WHO, Medline Complete).

3.6 Exclusion criteria

Countries were excluded if they met any of the following conditions:

- Lack of reliable, verifiable, or complete information on oral health indicators (DMFT, periodontal disease, edentulism, caries prevalence).

3.7 Variables analysed

The following variables were examined:

- Type of care model: private, mixed, or state
- Type of coverage: universal, partial, or private
- Oral health indicators: DMFT at age 12, prevalence of periodontitis, prevalence of edentulism
- Social determinants: GDP per capita, total expenditure on dental healthcare in millions of US dollars.
- Preventive determinants: Average consumption of sugars and sweeteners (g/person/day), percentage of population supplied with fluoridated water, global availability of dentistry personnel (per 1 million people).

3.8 Procedure

Using data extracted from CAPP, the WHO Global Oral Health Status Report, and complementary sources, a comprehensive comparative dataset was constructed. This table included variables such as oral health system, type of dental coverage, DMFT, prevalence of periodontitis, prevalence of edentulism, and other relevant indicators. This dataset served to describe and

compare the relationship between national health system and resulting oral health inequalities worldwide.

3.9 Statistical analysis

Given that this study was based on secondary, country-level indicators rather than individual-level data, the analysis was descriptive and comparative in nature. Epidemiological, socioeconomic, and preventive variables were organised into comparative tables to facilitate cross-country comparison. Countries were grouped according to oral health care systems type, dental coverage model, income level, and geographical region. No inferential statistical analyses were conducted, as the aim was to describe patters and contrasts rather than to stablish casual relationships.

3.10 Limitations

The study faced limitations related to the unequal availability of data across countries and heterogeneity in the definition and reporting of oral health indicators, which may affect cross-country comparability. These limitations should be considered when interpreting cross-country comparisons.

3.11 Ethical issues

This study received approval from the faculty committee under the reference code TFG 89: OD.666/2526.

4. RESULTS

These results presented in this section are based on the compilation and comparison of oral health system models and population-level oral health indicators across countries. Data were retrieved from the Oral Health Country/Area Profile Project (CAPP), complemented by information from the World Health Organisation (WHO), the World Dental Federation (FDI), and additional international databases. All variables described in the methodology were organised into a comparative table to facilitate cross-country description.

The dataset includes countries from Europe, the Americas, Asia, and Africa, classified according to oral health care system model, type of dental coverage, presence of preventive programmes, and key epidemiological and socioeconomic indicators. These indicators comprise DMFT at 12 years of age, prevalence of periodontitis, prevalence of edentulism, gross domestic product (GDP) per capita, national expenditure on dental care, water fluoridation coverage, sugar consumption, and availability of dental professionals.

A summary of the compiled data is presented in **Table 1**, which allows descriptive comparison of oral health systems and oral health outcomes across countries.

Country	Dental care coverage	Oral health system	DMFT (at 12 years old)	% Periodontitis	% Edentulism	% of population supplied with fluoridated water	GDP (current US$) by capita	Total expenditure on dental healthcare in million	Global availability of dentistry personnel (per 1 million people)	Average consumption of sugars and sweeteners (g/person/day)
France	Partial public coverage	Public dominance	0.91	16.2	12.6	3	3,160 billion$	12 666	500-999	More than 100
Spain	Limited adult coverage	Mixed dominance	0.58	6.7	8.9	11	1,726 billion$	8 306	100-499	51-75
Germany	Partial (broad statutory coverage for essential care)	Mixed with public dominance	0.44	27.4	11.7	No	4,686 billion$	30 877	500-999	More than 100
United Kingdom	Public coverage via NHS + large private dental market	Public dominance	0.5	10.6	12.0	10	3,686 billion$	9 577	500-999	More than 100
Norway	Children fully covered Adult partial coverage	Public	0.8	25.0	11.0	No	483 billion$	2 169	500-999	More than 100

Country	Dental care coverage	Oral health system	DMFT (at 12 years old)	% Periodontitis	% Edentulism	% of population supplied with fluoridated water	GDP (current US$) by capita	Total expenditure on dental healthcare in million	Global availability of dentistry personnel (per 1 million people)	Average consumption of sugars and sweeteners (g/person/day)
United States	Mostly private insurance or out of pocket payments	Private	3.6	15.7	10.2	73	28,751 billion$	133506	1000 or more	More than 100
Brazil	Partial (public preventive/ basic services + private complementary care)	Mixed with public dominance	1.9	17.5	14.4	Not available	2,186 billion$	3 713	1000 or more	More than 100
Mexico	Partial (public preventive/ basic services + private complementary care)	Mixed with public dominance	2.6	22.7	9.5	3	1,856 billion$	2 103	100-499	More than 100
Argentina	Partial coverage (public preventive/ basic services + private complementary care)	Mixed with public dominance	3	18.0	7.9	19	638 billion$	1 106	500-999	More than 100
Canada	Limited public coverage	Public dominance	1	24.7	7.7	44	2,244 billion$	12829	1000 or more	More than 100

Country	Dental care coverage	Oral health system	DMFT (at 12 years old)	% Periodontitis	% Edentulism	% of population supplied with fluoridated water	GDP (current US$) by capita	Total expenditure on dental healthcare in million	Global availability of dentistry personnel (per 1 million people)	Average consumption of sugars and sweeteners (g/person/day)
Japan	Partial with extensive mandatory coverage	Public dominance	0.63	20.6	11.7	Not available	4,028 billion$	28 734	500-999	76-100
China	Partial coverage, large out of pocket	Mixed	0.86	17.5	5.7	15	18,744 billion$	61 749	Fewer than 100	25 or less
India	Minimal public coverage, large out of pocket	Mixed with private dominance	1.6	21.8	4.0	5	3,910 billion$	64	Fewer than 100	51-75
South Korea	Partial (public preventive/ basic services + private complementary care)	Mixed with public dominance	1.8	18.2	5.1	Not available	1,875 billion$	7 255	100-499	76-100
Indonesia	Partial coverage (public preventive/ basic services + private complementary care)	Mixed with public dominance	1.4	19.6	5.6	Not available	1,396 billion$	267	Fewer than 100	26-50

Country	Dental care coverage	Oral health system	DMFT (at 12 years old)	% Periodontitis	% Edentulism	% of population supplied with fluoridated water	GDP (current US$) by capita	Total expenditure on dental healthcare in million	Global availability of dentistry personnel (per 1 million people)	Average consumption of sugars and sweeteners (g/person/day)
Nigeria	Very limited public coverage	Private dominant	1.76	25.1	1.7	0.01	188 billion$	137	Fewer than 100	26-50
Kenya	Very limited public coverage	Mixed with private dominance	0.4	20.6	1.6	Not available	116,7 billion$	0.03	Fewer than 100	26-50
Egypt	Very limited public coverage	Mixed with private dominance	0.4	14.2	7.8	Not available	389 billion$	329	100-499	76-100
South Africa	Very limited public coverage	Mixed with private dominance	1.12	24.8	8.4	Not available	401 billion$	2 286	100-499	76-100
Ethiopia	Very limited public coverage	Private dominance	1.3	18.7	1.8	Not available	Not available	0.1	Fewer than 100	25 or less

Table 1. Results extracted from the Oral Health Country/Area Profile Project (CAPP), complemented with information from the World Health Organisation (WHO), the FDI World Dental Federation, and additional international databases organized per continents in the world.

Countries showing DMFT values below 1 included France, Spain, Germany, the United Kingdom, Norway, Canada, Japan, China, Kenya, and Egypt. Higher DMFT values, above 2.6, were observed in Mexico, Argentina, and the United States. Regarding periodontal disease, lower prevalence values (≤16%) were reported in France, Spain, the United Kingdom, the United States, and Egypt, while higher prevalence values (≥25%) were observed in Germany, Norway, and Nigeria. Lower levels of edentulism (≤8%) were identified in countries such as Ethiopia, Kenya, Nigeria, Indonesia, South Korea, India, China, and Spain, whereas higher percentages were reported in Brazil, France, and the United Kingdom.

Differences were also observed across countries in relation to preventive and socioeconomic indicators. Higher levels of sugar consumption, wider coverage of water fluoridation, and greater availability of dental professionals varied substantially between countries. Similarly, large differences were observed in gross domestic product per capita and national expenditure on dental care. These variables showed heterogeneous patterns across regions and oral health care system models, as detailed in **Table 1**.

5. DISCUSSION

In this comparative analysis, the results highlighted substantial disparities in oral health outcomes between countries, reflected in differences in healthcare systems, epidemiological indicators, and preventive measures.

5.1 Association between oral health care system models and oral health outcomes

Publicly oriented healthcare systems tended to present lower DMFT values, suggesting a lower caries experience at the population level, while the prevalence of periodontitis appeared to be relatively evenly similar across public and private systems. Lower rates of edentulism were observed in several countries with predominantly private healthcare models. In contrast, higher prevalence values of periodontitis were reported in some private systems, whereas higher levels of edentulism were observed in certain countries with predominantly public healthcare systems, highlighting the complex relationship between healthcare financing models and oral health outcomes.

The analysis suggests that the type of healthcare system is related to different oral health indicators in a complex manner. Public healthcare systems appear to be associated with lower DMFT values, which may reflect broader access to preventive and basic dental care. In contrast, the prevalence of periodontitis does not appear to differ markedly between public and private systems, remaining relatively similar across models.

Edentulism rates, however, may reflect differences in access to restorative or prosthetic care, particularly among populations with the financial capacity to obtain such treatments. In some publicly funded systems, higher levels of edentulism were observed, suggesting that, despite universal coverage, access to more complex or costly interventions may be limited. Overall, these findings indicate that public systems tend to be more effective in promoting prevention and basic care, whereas private systems may limit tooth loss through greater access to advanced treatments. These general patterns address the main objective of the study, which was to examine how different oral health care systems relate to inequalities in oral health outcomes.

5.2 Influence of preventive strategies within oral health systems on outcomes and inequalities

Preventive strategies also appeared to be associated with differences in oral health outcomes. The findings suggest that oral health indicators are not determined solely by the type of healthcare system, but by how preventive measures are implemented within each model. Publicly oriented systems tended to present lower DMFT values, which may reflect broader access to preventive interventions, such as basic dental services, oral health education, and, in some settings, fluoridation policies. Overall, these observations highlight the relevance of population-based prevention approaches when examining variations in caries experience across countries.

However, the finding also show that lower levels of edentulism were observed in some countries with predominantly private healthcare systems, despite higher DMFT values. This may reflect differences in access to advanced restorative and prosthetic treatments for individuals who can afford them. In contrast, publicly funded systems, even when effective in prevention care, showed higher levels of edentulism in certain settings, suggesting that access to more complex or costly dental treatments may be limited.

Preventive factors such as sugar consumption and water fluoridation also appeared to play an important role in the observed patterns. Higher levels of sugar intake, reported in countries as the United States and Brazil, were associated with higher DMFT values, regardless of the type of healthcare system. This finding underscores the relevance of dietary factors when interpreting variations in caries experience across countries. In contrast, water fluoridation appeared to be more closely related to lowered levels of severe outcomes, such as edentulism, but may not be sufficient on its own to control DMFT levels in contexts exposure to other risk factors remain high.

Additionally, the availability of the dental workface may influence the interpretation of the results. Countries with a lower density of dental professionals, such as Nigeria, Kenya and Ethiopia, presented lower DMFT values and edentulism prevalence. These findings may reflect underdiagnosis and limited access to dental care services, rather than indicating better oral health at the population level.

To sum up, the results suggest that public systems tend to be associated with lower caries experience through broader preventive strategies, while private systems appear to be related

to lower levels of tooth loss due to greater access to advanced care. These observations indicate that improvements in oral health outcomes may require a combination of effective prevention and equitable access to treatment.

5.3 Influence of socioeconomic indicators on oral health outcomes

Socioeconomic indicators also appeared to be related to the differences observed across countries. Higher gross domestic product (GDP) per capita or increased national expenditure on oral health did not consistently correspond to more equitable oral health outcomes. For example, the United States presented high DMFT value despite its economic capacity. These observations suggests that system orientation, public coverage, and preventive focus may play an important role alongside economic factors. Conversely, some middle-income countries with strong preventive approaches showed oral health outcomes that were more favourable than those expected based solely on economic indicators, as illustrated by Norway's low DMFT value.

5.4 Alignment with existing literature

The results of this study are consistent with existing evidence indicating that healthcare systems relying predominantly heavily on private financing tend to display greater inequalities in access to dental care, while publicly regulated or mixed systems are generally associated with more equitable utilisation of health services (28,29). Previous research has also shown that countries implementing population-based preventive programs, such as community water fluoridation and other public health interventions, may contribute to reductions in oral health inequalities. These findings are in line with the patterns observed in the present analysis (30,31).

5.5 Limitations of the study

Several limitations should be considered when interpreting the findings of this study. First, the availability and quality of oral health data varied considerably across countries, which may limit cross-country comparability. Second, information on certain indicators, such as the proportion of the population supplied with fluoridated water and average sugar and sweetened consumption, was not available for all the countries included in the analysis. Third, the use of population-level secondary data rather than individual-level data prevents the establishment of causal relationships. Despite these limitations, the descriptive patterns identified provide valuable insight into how health system characteristics and preventive strategies may be related to oral health inequalities.

Overall, the findings of this study highlight the relevance of prevention-oriented and equity-focused oral health care systems when addressing global oral health inequalities. Strengthening public coverage, expanding preventive programmes, and integrating oral health within broader health policies may contribute to reducing disparities across countries. These observations support current international efforts aimed at promoting more accessible and equitable oral health care for all.

6. CONCLUSIONS

Health care systems appear to be related to oral health outcomes in different ways. Public systems with broader coverage tend to be associated with lower DMFT values, reflecting greater emphasis on prevention and basic dental care, while private systems are more frequently associated with lower levels of edentulism, likely due to increased access to advanced restorative and prosthetic treatments. In contrast, the prevalence of periodontitis appears to be less dependent on the type of health care system alone.

Oral health outcomes are influenced by both preventive strategies and access to care. Public systems tend to support population-based prevention and contribute to lower caries experience, while private systems may limit tooth loss through improved access to complex treatments for certain populations. High sugar consumption remains an important risk factor across all systems. Therefore, reducing oral health inequalities requires a combined approach that strengthens preventive strategies while ensuring equitable access to dental services.

7. SUSTAINABILITY

This review contributes to social sustainability by addressing global inequalities in oral health and access to preventive care. By comparing preventive strategies across countries with different healthcare systems, the study highlights approaches that may improve access to prevention and early treatment, thereby supporting overall health and well-being (32).

From an economic perspective, preventive oral health strategies are widely recognized as cost-effective. Focusing on prevention rather than late-stage treatment may reduce the economic burden of oral diseases on both healthcare systems and individuals by optimising resource allocation and limiting the need for complex and costly interventions. This approach supports the long-term financial sustainability of health care systems (17,34).

In terms of environmental sustainability, preventive dentistry can contribute to reducing the need for resource-intensive treatments that generate medical waste and consume significant materials and energy. Preventive measures, including oral health education and early interventions, may decrease the consumption of dental materials and clinical waste production. Promoting prevention-oriented oral health systems therefore aligns with more environmentally responsible health care practices (24).

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