



Valediction

Peter G Robinson

This issue marks another series of big changes for *Community Dental Health*. Whilst the cliché tells us that there is nothing permanent except change, Darwin realised that it's "not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change". We're heeding Darwin's words, even though his star never rose as high as publishing in this journal.

The world of academic journals is especially susceptible to such shifts. Open Access (OA) publishing makes research findings freely available, with researchers paying to publish their work, rather than expecting readers to cough up for the privilege. Many research funders require data to be openly accessible in this way. Of course, this is a new funding model, but for the last ten years we have allowed authors to choose OA publication.

There are also more academics submitting more papers, with a particular rise in manuscripts from outside of Europe. This growth is accompanied by an increase in the number of journals. Unfortunately, predatory journals have emerged that do not adhere to standards of ethics or peer review and there are now parallel concerns about the integrity of some researchers; and that's before we think about Artificial Intelligence. In this context, the need for *CDH* to maintain its standing as a high-quality journal demands more work and a better prepared Editorial Board and referees.

In addition, driven by a centralisation of publishing and their need to minimise costs, libraries now subscribe to packages of journals from academic publishers rather than to individual titles. A small journal from a non-academic publisher is an easy target in libraries' spending reviews, and we have seen our revenue from institutional subscribers fall by 30% in the last ten years. Naturally, printing and postage costs have continued to increase, and we have been mindful of our energy and paper use. Putting the journal in fewer libraries means that fewer academics can read it and then think of submitting their work to us. Reassuringly, *CDH* has thrived despite all these challenges; the journal's ranking for the number of times we are cited has risen to its highest level ever.

Over the last eight years *CDH* has responded radically to this mutable environment by:

- Using the growing number of submissions to drive quality, by only publishing the very best papers.
- Publishing the journal online only
- Strengthening our links with the European Association for Dental Public Health and El Sociedad Española de Epidemiología y Salud Pública Oral (SESPO, The Spanish Association of Dental Epidemiology and Oral Public Health).

- Prioritising systematic and critical reviews to maintain the quality and relevance of our content
- Raising our visibility on social media and using editorials as provocative reviews
- Reducing manuscript turnaround times so that mean time from submission to publication has fallen from 21 months in 2012 to only 8.5 months (papers go online 3 months ahead of publication).
- Making our content more accessible to members and opening our archive so that anyone can access all papers more than 3 years old

As already noted, *CDH* can only enhance its standing by being able to anticipate and shift in such a volatile world. One way to do that is to engage with a dedicated academic publisher. Our current publishers (*This is DB*) are a marketing agency working on project management, printing, design, IT, marketing and logistics, as well as academic publishing. This broad range of activities brings many skills relevant to *CDH*, but it is now time for us to move to a specialist publisher. From the next issue onwards, *CDH* will be published by Sage, who will help us be proactive and will market the journal to libraries as part of a suite.

The final change is to welcome a new Editor from 2025. *CDH* has been very lucky to recruit Dr Wael Sabbah, of King's College, London. Wael has been a long-standing and energetic member of our Editorial Board and is a vastly experienced researcher. *CDH* will be in excellent hands.

This then, will be my last issue as Editor. It has been an enormous privilege to act in this capacity for the last eight years. As a junior academic I remember being in awe of my predecessors, so this has been one of the proudest parts of my career. It's also been fulfilling to support less experienced colleagues with their work and to see the journal develop amidst everything else that's been going on.

Such a busy tenure would not have been possible without fantastic support. In one guise or another, *This is DB* has published *CDH* since its foundation, 40 years ago. Throughout my time, Dennis and Jo, our friends there, have been unfailingly positive, responsive and kind. I wish them all good fortune for the future. Although practically unseen to most people, Jan Vicary has been a force of nature as our Editorial Assistant. She has kept the journal (and me!) on track with her proactive, alert and smart work and I am immensely grateful for all that she has done. Lastly, our Editorial Board have been a great sounding board and a source of wise advice. Some of them are standing down at the same time as me. Here's to plenty of cycling and fishing.

Tooth-loss related masticatory and aesthetic experiences among middle-aged and older adult Danes

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Objective: To determine whether tooth loss relates to patient experiences of masticatory or aesthetic problems and is a useful measure of oral health and treatment needs and to compare experiences of tooth loss among middle-aged and older Danes. **Basic research design:** Cross sectional online- and telephone interview questionnaire study. **Participants:** 1,060 Danish citizens aged 40 years or older. **Main outcome measures:** Experiences of difficulties eating/enjoying food or smiling/showing of teeth due to tooth related problems within the last 6 months. Data analysis used tests of proportions and ordinal logistic regression. **Results:** Half the participants had a full or almost full dentition. Among those with tooth loss, 21-44% reported difficulties eating/enjoying food. In ordinal logistic regression, difficulties eating were associated with being younger, having fewer teeth and having visibly missing teeth. Being unwilling to smile or show one's teeth was associated with being younger, having fewer teeth, having lower socioeconomic position and having visibly missing teeth. Wearing a prosthesis did not ameliorate eating difficulties or unwillingness to smile. **Conclusions:** Tooth loss is a meaningful measure of oral health but cannot stand alone. Many adults with even substantial tooth loss did not experience functional or aesthetic problems. Tooth loss is associated with negative masticatory and aesthetic experiences among middle-aged than older adults. Removable prostheses were not associated with better functional or esthetic outcomes.

Keywords: Tooth loss, Patient Reported Outcome Measures, Middle aged, Aged

Introduction

There is worldwide population growth among middle-aged and elderly adults (United Nations, 2019). Adults also retain more teeth, which both improves their chances for better oral function, but also increases their risk of more dental disease (Müller *et al.*, 2017), adding to the need for oral health care. Furthermore, evidence of interactions between oral and general health (Holmstrup *et al.*, 2017), difficulties in providing optimal care for patients burdened by complex drug regimens and multimorbidity (Wastesson *et al.*, 2018), and knowledge of the detrimental effect of poor oral health on quality of life (Øzhayat *et al.*, 2016), all point to greater need for oral health care for middle-aged and older adults.

The number of natural retained teeth (or its reciprocal, tooth loss) has traditionally and normatively been considered an important indicator of oral health. Tooth loss can be measured using self-reports (Quirino *et al.*, 2013) but does not tell health care planners anything about the need for dental care. Attention to subjective measures of oral health and treatment need, by including the patient's perspective, has added useful knowledge about Oral Health Related Quality of Life (OHRQoL). Tooth loss is associated with worse OHRQoL and the location and distribution of lost teeth affect the severity of the impairment (Gerritsen *et al.*, 2010).

Danish adults have good oral health, with the highest number of functional dentitions in the world (Guarnizo-Herreño *et al.*, 2013). Unfortunately, not everyone has a full dentition free from disease, especially among socially vulnerable middle-aged and elderly citizens (Guarnizo-Herreño *et al.*, 2013; 2019). Studies of patient-reported outcomes and symptoms among the middle-aged and elderly suggest that poor oral health negatively affects life, especially in social contexts (Øzhayat *et al.*, 2016; Rosing *et al.* 2019), and that several factors influence that relationship (Rosing *et al.*, 2019; Øzhayat, 2013). However, existing data are based on small and selected populations and have conflicting findings on the best indicators of oral health and treatment needs.

The two main indications for treatment of tooth loss are aesthetic and masticatory impairments. It thus makes sense to focus on these experiences. However, middle-aged adults may perceive aesthetic issues differently from older people, as aesthetic norms may be affected by socially constructed cohort effects. Conversely, masticatory issues may be seen as individual experiences isolated from social influence and therefore expected to be more similar across age-groups. Comparisons of whether elderly and middle-aged adults perceive tooth loss related issues similarly have, however, to our knowledge not been carried out.

Food insecurity and periodontitis in US adults

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Objectives: To determine the relationship between food insecurity and periodontitis among adults in the United States (US). **Methods:** Secondary analysis of the 2009–2014 National Health and Nutrition Examination Survey data. The sample included 6,108 US participants aged ≥ 30 years in a probability weighted sample. Periodontitis status was measured in full-month oral examinations at 6 sites per tooth for clinical attachment loss and periodontal probing depth. Food insecurity was assessed by the 18-item US Food Security Survey Module. **Results:** Controlling for covariates, multiple logistic regression showed that periodontitis was associated with low food security (adjusted odds ratio (aOR)=1.30, 95% CI: 1.08–1.57). Risk factors for periodontitis included HbA1c $\geq 7\%$ (aOR=1.74, 95% CI: 1.26–2.40), seeking emergency dental care (aOR=1.36, 95% CI: 1.19–1.55), smoking status, racial minorities, low income, and older age. Protective factors for periodontitis were annual dental visit (aOR=0.52, 95% CI: 0.43–0.64), health insurance (aOR=0.66, 95% CI: 0.54–0.80), female gender, and college education. **Conclusions:** Food insecurity was associated with a higher risk of periodontitis among US adults. Having enough food to eat is a basic human right and would improve well-being.

Keywords: periodontal disease, United States, glycemic control, adult, food security, health surveys

Introduction

Periodontal disease, which encompasses all conditions from gingivitis to advanced periodontitis, results from infections and inflammation of the gums and bone around the teeth. Left untreated, periodontal disease can progress to periodontitis, leading to loss of bone and tooth. Periodontal disease affects close to half of all adults who are 30 years old and older in the United States (US), with 8% of them having periodontitis (Eke *et al.*, 2018).

The social and economic determinants of oral health are well documented (Braveman and Gottlieb, 2014). For example, individuals of lower socioeconomic status (Hwang *et al.*, 2011), racial minorities (Williams *et al.*, 2021), those lacking dental insurance are less likely to have regular dental checkups (Darmawikarta *et al.*, 2014). Although the mechanisms are not well understood, recent research points to a link between food insecurity (the inability to access an adequate diet for an active and healthy life) and oral health (Lee *et al.*, 2023; Testa *et al.*, 2022). There are reasons to expect food insecurity to be related to periodontitis. First, food insecurity is associated with inadequate access to dental care in children, including dental checkups (Anil and Anand, 2017), which may be due to a lack of economic resources needed to access necessary dental services. Second, food insecurity may be an indicator of deprivation, which may not be adequately accounted for in existing studies.

The aim of this study is to determine the relationship between food insecurity and periodontitis. Only one recent study has examined this association and focused on middle-aged and older adults in the US and South Korea, which found an association only for middle-aged adults in the US. However, there are a few limitations from that

study that we attempt to improve on. First, we expanded the analysis to all adults older than 30 years and used additional years of data. Second, we included additional covariates to reduce the risk that they confounded this relationship. Given the many negative consequences of periodontitis on health, it is important to have a better understanding of its determinants, especially given that food insecurity affects 12.8% of households in the US (Rabbitt *et al.*, 2023).

Method

Data for this study came from the 2009–2014 National Health and Nutrition Examination Survey (NHANES), a publicly available dataset with a cross-sectional, multistage, probability cluster design to produce a sample representing the US civilian noninstitutionalized population (Bahanan *et al.*, 2021). Sampling weights were used in regression analyses to account for the complex design (Eke *et al.*, 2018).

The study sample includes 6,108 US participants aged ≥ 30 years who received periodontal examinations and completed the food security questionnaire. The dental examination was performed by trained and calibrated dentists in mobile examination centers (MEC) (Eke *et al.*, 2018). Participants were listwise excluded if they had incomplete information on one or more variables of interest to this study.

Our main outcome of interest was a binary variable indicating periodontitis. Participants were classified as having periodontitis if their measurement of clinical attachment loss and periodontal pocket depth met the criteria of the case definition set by the Centers for Disease Control and Prevention and the American Academy of

Demographic factors associated with oral health behaviour in children aged 5–17 years in Algeria

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Objectives: Oral health plays an important role in determining quality of life, general health, and well-being in both children and adults. The wide variation in oral health status around the world is determined by multiple factors, including oral health behaviour (OHB). The aim of this study was to explore the association of some demographic factors with OHB in children aged 5 to 17 in Algeria. **Methods:** Secondary analysis of cross-sectional data involving all children aged 5 to 17 in the Multiple Indicator Cluster Survey database, conducted in 2018–2019 (MICS-6), i.e., 17019 children (8882 boys and 8137 girls). Using a logistic regression model, we assessed the contribution of different demographic, economic, and geographical factors to children's OHB. **Results:** The overall prevalence of good oral hygiene practices was 9.32% (8.30% for boys and 10.36% for girls). The main factors associated with good OHB were gender (OR=1.27 [95% CI = 1.135–1.437]), residence (OR=0.641 [0.553–0.742]), geographical area particularly in the southern and highlands regions (OR=0.369; [0.28–0.48]), older age, mother's level of education (OR=2.61 [2.12–3.21]), employment status, and economic level (OR=3.30 [2.64–4.12]). **Conclusions:** The identification of factors related to OHB in children is of great interest in developing countries such as Algeria, to adopt planned and targeted health promoting interventions for children, adolescents, and parents.

Keywords: Algeria, Children, Oral health, Associated factors, MICS6

Introduction

Oral health plays an important role in determining quality of life, general health, and well-being in both children and adults. It enables them to perform essential functions and influences their self-confidence, their ability to form social bonds, and their ability to work without pain and discomfort (World Health Organization (WHO), 2022).

Although most oral diseases such as dental caries and gingival conditions are preventable, they are the most widespread in the world in general and in Africa in particular. In 2019, oral diseases affected around 43.7% of the population in the African Region of the World Health Organization (WHO), 2022).

The wide variation in oral health status around the world is determined by multiple factors, including demographic structure, levels of oral health behaviour (OHB), dental programs, oral and accessibility to dental health professionals (Fiorillo, 2019).

Good OHB in children not only helps to prevent dental diseases such as cavities but also promotes the healthy development of teeth and gums (WHO, 2022). This crucial stage in children's growth requires an educational and preventive approach involving parents, educators, and dental health professionals. By understanding the importance of a balanced diet, optimal brushing practices and the appropriate choice of dental products, parents can play an essential role in preserving their children's oral health (Thilakarathne, 2023; Al Subait *et al.*, 2016). Tooth brushing should start as soon as the first tooth erupts, generally from the age of six months. Brushing twice a day with fluoride toothpaste reduces the risk of tooth decay

by 14% (American Dental Association Council, 2014). Fluoride plays a fundamental role in the prevention of dental caries and is also used therapeutically to inactivate incipient caries lesions. The effect of fluoride is mainly achieved by topical application, which is further enhanced when accompanied by good oral hygiene, particularly in children (Toumba *et al.*, 2019).

However, oral health behaviours appear to mediate the effect of broad demographic factors in the aetiology of oral disease. Consequently, studying the demographic determinants of OHB in children is of crucial importance in understanding the disparities that may exist in oral health within the child population. By examining these determinants, we aim to identify the factors influencing dental care behaviour to devise and target interventions.

In Algeria, a study carried out by the National Institute of Public Health (INSP) in 2013 on the oral health status of Algerian children revealed that 36.3% of children under 15 had poor oral hygiene (INSP, 2014). Few recent studies have analysed the determining factors in the practice of oral hygiene in Algeria. Most of these studies, which have focused on schoolchildren or adolescents, have been conducted at regional level (Tahari, 2023). Given that the MICS survey reports are limited to descriptive analyses, this study aimed to explore the association between some demographic, economic, and geographical factors (gender, mother's level of education, geographical area of residence, wealth index, etc.) with OHB of children aged 5 to 17 in Algeria. Knowing and mastering these factors will help us to understand the disparities that may exist in oral health within the child population and will also help better target oral health promotion strategies.

Integrating health screening for non-communicable diseases into dental services: what do we know?

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This narrative review describes the impetus for health screening for non-communicable diseases in dental settings and highlights important considerations for evaluating such interventions. Real world cases are presented that showcase health screening interventions implemented in the UK. Non-communicable diseases including diabetes and cardiovascular disease are a global public health challenge. They are largely preventable by implementing lifestyle changes such as healthy eating and participation in physical activity, regular health screening for disease prevention, and/or early initiation of treatment. Hypertension case finding and control is one of the key five areas of focus for adult health, and oral health and diabetes are two of five key clinical areas for children and young people where efforts should be focused to intervene, improve outcomes and reduce inequalities. Links between oral and chronic diseases have been discussed in recent years. Therefore, screening for diabetes and cardiovascular disease has become of greater relevance to the dental profession. There is emerging evidence indicating that screening for the risk factors of cardiovascular diseases and diabetes in dental settings shows promise for improving health outcomes and may offer a cost-effective preventive approach for the detection of diabetes. Real-world services implementing health screening in dental settings have highlighted possibilities for the future and highlight the potential for the role of the dental team in detecting chronic diseases.

Keywords: dental public health, clinical outcomes, Screening

Introduction

Globally, the epidemic of non-communicable chronic diseases (NCDs) is one of the greatest threats to public health (World Health Organisation, 2019). NCDs, including diabetes and cardiovascular disease, are largely preventable by implementing lifestyle changes such as healthy eating and physical activity, regular health screening for disease prevention, and/or early initiation of treatment. Therefore, health screening forms a critical part of the public health response to chronic disease management in the population by detecting disease at an early or asymptomatic stage, with the aim of improving health outcomes and reducing associated health care costs.

In the United Kingdom (UK), the number of children and adults living with chronic diseases, such as diabetes and cardiovascular disease, is increasing (Ng *et al.*, 2024) and preventing chronic diseases at all stages of life is important for reducing related morbidity and mortality. For example, age at diagnosis of type II diabetes (T2DM) predicts survival and cardiovascular risks and has implications for determining the timing and intensity of risk factor interventions for clinical decision making. Preventing/delaying T2DM onset in younger individuals is key to improving long term health outcomes (Sattar *et al.*, 2019). In England, almost three-quarters of people aged under 40 years who are diagnosed with T2DM are also living with obesity (NHS England, 2023). Overall, in England, 63.8% adults and 37.7% of 10–11-year-old children are living with overweight or obesity which can adversely impact their health and wellbeing (Baker, 2023).

Key screening outcomes for the risk factors associated with chronic disease include blood glucose and/or HbA1c, cholesterol, triglycerides, blood pressure, and assessment of height and weight for the calculation of body mass index and height to waist ratio. Screening for these outcomes also typically forms part of the National Health Service (NHS) Health Check offered by general practices to assess cardiovascular health and overall well-being of patients aged ≥ 40 years (Tanner *et al.*, 2022).

Oral diseases such as dental caries and periodontal disease are also associated with NCDs (Herrera *et al.*, 2023; Doughty *et al.*, 2023; Public Health England, 2019; Holm *et al.*, 2016; Daley, 2022; Taylor, Manz and Borgnakke, 2004; Sanz *et al.*, 2018). In 2023, Doughty *et al.* published a call to action to recognise the potential that dental professionals have to be involved in screening for chronic disease following the NHS Health Check approach (Doughty *et al.*, 2023). However, despite increasing evidence demonstrating the opportunities for health screening in dental settings and the relationship between oral and general health, limited real-world health screening and engagement of the wider dental profession has taken place.

To date, researchers have explored the potential for health screening to be offered to patients seen in dental settings to identify conditions such as obesity, diabetes, atrial fibrillation, hypercholesterolaemia, hypertension, metabolic syndrome, HIV and HPV (Doughty *et al.*, 2023; Obaid Hassan *et al.*, 2023; Conway *et al.*, 2016; Suarez-Durall *et al.*, 2019; Doke *et al.*, 2021). This narrative review presents the rationale for health screening



Unmet Dental Care Needs of The Low-Income Elderly in South Korea: Applying the Andersen behavioural model

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Objective: Retirement reduces income and increases dental care needs for the elderly, but there are few studies on unmet dental care needs among the low-income elderly. This study aimed to identify actors associated with unmet dental care needs of low-income elderly people in South Korea. **Method:** Secondary analysis of 2020 KNHANES data relating to 1,016 elderly individuals (65+) below median income. **Results:** Unmet dental care needs were higher for women at 28.9% ($p < 0.001$), those with a middle school education at 28.5% ($p < 0.05$), individuals who rated their health as “poor” at 31.3%, those reporting feelings of depression at 44.8% ($p < 0.001$), individuals who rated their oral health as “poor” at 36.2% ($p < 0.001$), and those who experienced toothache at 37.2% ($p < 0.001$). In regression analysis women (Risk Ratio = 1.59, 95% CI 1.09-2.32), people with depression (RR = 2.29, 95% CI 1.01-5.15), those who perceived their oral health as “poor” (3.20, 95% CI 1.90-5.32) and those toothache (1.88, 95% CI 1.27-2.76) had higher unmet dental needs. **Conclusion:** Substantial unmet dental care needs exist among the low-income retired elderly. Comprehensive public oral health policies and community programs are needed for this population group.

Keywords: oral health, public policy, South Korea, unmet dental care needs, the low-income elderly, KNHANES

Introduction

The elderly experience lower income due to retirement, while their need for dental care increases. As of 2020, the income poverty rate among South Korean seniors was 40.4%, approximately three times higher than the OECD average, and the highest among OECD countries (OECD, 2023). Also, the dental health coverage rate was only 33.2% in 2021, which is about half of national rate, leading to out-of-pocket expenses for the elderly (Jung Wook and Ho Joong, 2019). This greatly impacts the utilization of dental services among the elderly, who are more vulnerable to diseases. Oral health should be maintained as part of general health (Brennan *et al.*, 2008; Malecki *et al.*, 2015; Rosa, 2020). It is a prerequisite for general health, making the accessibility of dental services a global public health issue and a community health challenge to (Jonathan *et al.*, 2018; Mohamadi-Bolbanabad *et al.*, 2021).

Unmet dental needs are higher among women, those with lower income or educational levels (Rosa, 2020; Xianhua and Hee-jung, 2018), those experiencing more stress or depression (Capurro and Davidsen, 2017), poorer subjective health, activity limitations, poorer subjective oral health status, and those who have experienced toothache (Alkhalwaldeh *et al.*, 2023). However, these studies investigated adults or the elderly as a whole. In particular, information about income-poor seniors, who are more likely to have unmet dental care needs, are lacking. Therefore, this study aimed to identify actors associated with unmet dental care needs among low-income elderly people in South Korea. The purpose was to identify intervention strategies for unmet dental care utilization this

population group by applying the Andersen behavioural model (Andersen and Newman, 1973), which predicts individual healthcare utilization based on predisposing, enabling, and need factors.

Method

This was a secondary analysis of 2020 Korea National Health and Nutrition Examination Survey (KNHANES) data. KNHANES assesses health behaviours, chronic disease prevalence, and dietary and nutrition intake of 7,359 individuals aged one year and older in the Korean population, of whom 1,712 individuals were aged 65 and older. The income-poor elderly were defined as those with disposable income below 50% of the median income, as suggested by the OECD. Thus, this analysis included only the first and second income quintiles, representing 1,016 the income-poor elderly people. “Experience of unmet dental care needs,” was determined by the question, “In the past year, did you need a dental examination or treatment but were unable to receive it?” Responses of “yes” and “no” were used as the dependent variable, excluding non-responses. Subjective needs of this type are commonly used to evaluate access to healthcare services as they incorporate personal and social factors (Andersen and Newman, 1973; Moon and Kang, 2016). The independent variables were classified according to the Andersen behavioural model into predisposing, enabling and need factors. Predisposing factors included gender, age, marital status, and education level. Age was categorized as early elderly individuals aged 65-74 and 75 and older. Marital status was classified as married with spouse, married without spouse, and unmarried. Education level was divided into elementary school or below, middle

The effect of virtual reality for anxiety and pain in dentistry: A systematic review and meta-analysis

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Objectives: This study aimed to assess the impact of virtual reality (VR) on reducing anxiety and pain in dental patients across all age groups and dental procedures. **Methods:** Systematic review with comprehensive search of PubMed and Cochrane Library databases for randomized controlled trials (RCTs) comparing VR interventions with non-VR methods in dental settings up to April 2024. The selection followed the PRISMA-P guidelines. Inclusion criteria were based on the PICOS framework, focusing on studies involving dental patients of any age, utilizing VR during dental treatments, and reporting outcomes on anxiety and pain. Data extraction and quality appraisal were performed independently by two reviewers using the ROB-2 tool and GRADE methodology. Meta-analyses used a random-effects model. **Results:** Twenty-seven studies met the inclusion criteria, encompassing several dental treatments. In meta-analysis VR reduced anxiety in children (SMD -1.44, 95% CI -2.24 to -0.63) but not adults (SMD -0.35, 95% CI -1.11 to 0.4). For pain reduction, VR was effective in both children (SMD -1.11, 95% CI -1.65 to -0.57) and adults (SMD -0.59, 95% CI -1.187 to -0.001). Heterogeneity was high across studies, and evidence quality ranged from low to moderate. **Conclusions:** VR is a promising intervention for reducing anxiety and pain in children during dental procedures. Its effectiveness in adults is limited to pain reduction. High heterogeneity and risk of bias suggest that findings should be interpreted with caution. Further research is needed to standardize VR content and explore its varying impacts across different age groups and dental procedures.

Keywords: meta-analysis, technology, virtual reality, dental anxiety, dental pain, digital health

Introduction

One challenge that dental patients face before even visiting the clinic is the fear of pain and anxiety (McNeil *et al.*, 2001). Fear-related behaviors in dentistry can affect the quality and the treatment process and may lead to patients discontinuing treatment (McNeil *et al.*, 2001). Patients who experience considerable pain tend to delay their dental visit until it becomes essential, which can further increase their fear of treatment (Hoffman *et al.*, 2001). Ultimately, these negative emotions can intensify the patient's pain and anxiety (Cimpean and David, 2019). The fear of dentistry is the fifth most common fear and is more prevalent among younger than older individuals (Sweta *et al.*, 2019). In general, one-third of children aged 2 to 6 years experience dental anxiety (Sun *et al.*, 2024).

Managing fear and anxiety can also create an unpleasant experience for dentists. If patients do not cooperate, it prolongs the treatment duration and increases the use of resources, leading to dissatisfaction for both the dentist and the patient (Brahm *et al.*, 2012; Moore and Brødsgaard, 2001). The relationship between the dentist and the patient, influenced by the patient's fear and anxiety, can result in incorrect diagnoses (Eli, 1993). Furthermore, avoiding dental treatment due to stress leads to poor oral health, decay, and tooth loss (Van Wijk and Hoogstraten, 2003). Another consequence is sleep disturbance, which negatively impacts social interactions and workplace relationships and stems from reduced self-confidence (Cohen *et al.*, 2000).

Managing and treating dental fear and anxiety involves a variety of approaches. Therapeutic and psychological methods include psychotherapy, pharmacotherapy, singly or in combination (Appukuttan, 2016). The design and architecture of the dental office also impact patients' anxiety (Bare and Dundes, 2004; Lehrner *et al.*, 2000, 2005). Furthermore, establishing a close and trustworthy relationship between the dentist and the patient is crucial (Marci *et al.*, 2007). Other techniques for managing dental anxiety include relaxation (Biggs *et al.*, 2003), guided imagery (Hofmann *et al.*, 2010), biofeedback (Weinstein and Milgrom, 2009), hypnotherapy (Montgomery *et al.*, 2000), acupuncture (Müller *et al.*, 2023), and techniques to increase patient control (American Academy of Pediatric Dentistry, 2015). While these methods are diverse, many drawbacks include physical risks and being time-consuming. On the other hand, the distraction technique is considered a safe and affordable option for healthcare professionals (Rath and Khandelwal, 2019).

The American Academy of Pediatric Dentistry (2015) has identified various techniques for managing and treating fear and anxiety in children including communication, the tell-show-do (TSD) method, voice control, parental presence, and distraction. Distraction diverts the patient's attention from unpleasant experiences. One distraction technique is virtual reality (VR); an active method requiring the patient's participation (Addab *et al.*, 2022; Asokan *et al.*, 2020). Although uniform definition of VR is lacking (Bhardwaj and Bhardwaj, 2016; Mandal, 2013;



Barriers to oral health care for persons with disabilities: An overview of systematic reviews

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Background: Nearly one billion individuals globally live with disabilities, facing greater risk of dental issues. Systematic reviews have identified barriers to oral health care for persons with disabilities (PWDs), but a comprehensive synthesis to inform health-policy guidelines is lacking. This overview addresses this gap by summarizing the key barriers to oral health care access for PWDs. **Objectives:** (1) summarize key findings on the barriers PWDs encounter in seeking dental and oral healthcare, (2) evaluate the influence of disabilities on accessibility to dental and oral health services, and (3) identify facilitators to improve access and inform future health policy. **Methods:** Systematic review of systematic reviews of both cross-sectional and evaluative studies that identified barriers to oral health care access for PWDs. A comprehensive search of databases was conducted from inception to 24 February 2024, using specific keywords and Boolean operators. Data extraction and quality assessment were performed using AMSTAR 2 to ensure transparency and reliability. **Results:** Five systematic reviews were included. These reviews highlighted financial constraints, provider reluctance, access difficulties, systemic barriers, and patient-related factors as major obstacles. Methodological variations across reviews were noted, affecting the transparency and reliability of findings. **Conclusion:** Barriers to oral health care access for PWDs include financial, provider-related, access-related, systemic, and patient-related factors. Addressing these barriers, particularly in developing countries, should be a priority for future research and interventions.

Keywords: health disparities, oral health care, persons with disabilities, access to dental care, barriers to access

Introduction

According to the World Health Organization, approximately 1.3 billion people, or about 16% of the global population, live with significant disabilities. This number is rising due to the aging population and an increase in chronic health conditions. Disability is a natural aspect of the human experience, with most individuals likely to encounter temporary or permanent disabilities at some point. The occurrence of disability results from the interaction between a person's health conditions and contextual factors, including environmental and personal influences (WHO, 2022).

Oral healthcare is often considered a personal responsibility rather than a public health priority, leading to systemic neglect of oral health in many healthcare systems (Ozar, 2006; Wang *et al.*, 2020). Furthermore, persons with disabilities (PWDs) often do not receive priority in accessing healthcare, exacerbating their health disparities (Leal Rocha *et al.*, 2015; Lim *et al.*, 2021). PWDs typically have worse oral health and more susceptibility to dental diseases than the general population. Disparities in oral health are evident and vary depending on the type of disability (Zhou *et al.*, 2017; Uliana *et al.*, 2024; Bensi *et al.*, 2020; Costa Silva-Freire *et al.*, 2022; Rondón-Avalo *et al.*, 2024). These disparities stem not only from the impact of disability but also from greater unmet dental needs than the general population (Carter *et al.*, 2022; Scambler and Curtis, 2019).

Primary barriers refer to the main or most significant obstacles that individuals face when trying to access a service or resource. In the context of oral health care for PWDs, these barriers can include physical accessibility, such as the lack of ramps, elevators, or accessible examination chairs. Communication barriers might include difficulties in understanding or being understood due to communication impairments. Additionally, there may be issues with the availability of specialised dental services or practitioners trained to handle the specific needs of PWDs. Financial barriers, such as high costs or insufficient insurance coverage can also impede access to necessary dental care.

Accessibility, as defined by Levesque *et al.* (2013), refers to the ability of individuals to identify, seek, reach, obtain, and engage with healthcare services that meet their needs. Accessibility is a multidimensional concept encompassing several aspects: approachability, acceptability, availability/accommodation, affordability, and appropriateness. Physical access, which refers to the ability to enter and use healthcare facilities and equipment promptly, falls under the dimension of availability/accommodation. Service availability highlights the presence and capacity of healthcare services to meet the needs of various populations, while affordability addresses the financial feasibility of accessing services, considering factors such as insurance coverage and out-of-pocket costs. Awareness relates to approachability, which involves knowing about the availability of services and

Dentin hypersensitivity and quality of life in patients with chronic systemic disease

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Objectives: To assess the potential impact of dentin hypersensitivity on the quality of life in people with chronic systemic diseases. **Methods:** We included 252 volunteers, 18 years or older, with ≥ 6 teeth, and under outpatient medical follow-up for systemic chronic diseases. Short Form Health Survey 36 (SF-36) was used to assess quality of life (QoL); Oral Health Impact Profile-14 (OHIP-14) and Dentine Hypersensitivity Experience Questionnaire (DHEQ-15) were used for oral health-related quality of life (OHRQoL). Dentin hypersensitivity pain was assessed using an evaporative and tactile test, and pain assessment was performed using a numerical rating scale and a verbal rating scale. Medical information was obtained from anamnesis forms and the hospital digital medical records. **Results:** Of 252 participants, 60% had dentin hypersensitivity. There was a negative impact on the QoL/OHRQoL of individuals with dentin hypersensitivity regarding the vitality, mental health, physical functioning, and bodily pain dimensions of SF-36, and the functional limitation, physical pain, physical disability, and psychological disability dimensions of OHIP-14. Dentin hypersensitivity appeared to exert an indirect influence on QoL. **Conclusion:** Dentin hypersensitivity negatively impacts the quality of life in patients with chronic systemic diseases.

Keywords: quality of life, oral health, chronic disease, dentin hypersensitivity, patient health questionnaire

Introduction

Dentin hypersensitivity is characterized by short and intense pain caused by exposed dentin due to external stimuli, without any association with other forms of dentin pathology (Cartwright, 2014). This clinical phenomenon has the potential to affect the functional, psychological well-being, social dynamics, and overall pain and discomfort experience of an individual, which has a negative impact on their overall quality of life (QoL) and oral health-related quality of life (OHRQoL) (Goh *et al.*, 2016). The prevalence of dentin hypersensitivity varies considerably, ranging from 1% to 92% (Favaro Zeola *et al.*, 2019). This variation is due to factors such as the population studied, recruitment methods used, specific study environments and various diagnostic criteria used (Cartwright, 2014; Favaro Zeola *et al.*, 2019). Furthermore, the prevalence of this condition has increased, which has been attributed to more gingival recession, treatments associated with periodontitis, teeth whitening procedures, orthodontic interventions, and the increased retention of vital or minimally restored teeth over an individual's lifetime (Cartwright, 2014; Favaro Zeola *et al.*, 2019; Goh *et al.*, 2016).

Chronic systemic diseases present a substantial clinical challenge, contributing to more fatalities and disabilities than other disease categories (Vos *et al.*, 2020). Typically characterized by gradual progression and prolonged duration, chronic systemic diseases require ongoing medical interventions (Megari, 2013). This prevalence is increasing, which has been associated with advances in health

management and medical technologies, enhanced access to care, and the advent of novel medications (Sprangers *et al.*, 2000). The spectrum of chronic systemic diseases includes cardiovascular, respiratory, endocrine, renal, immunological, hematologic, mental health disorders, arthritis, osteoporosis, and cancer (Vos *et al.*, 2020). The impact of chronic systemic diseases on QoL is profound, as they compromise the general well-being of individuals, exerting adverse effects on physical, mental, psychological, and social dimensions (Megari, 2013; Vu *et al.*, 2022).

With the steady rise in life expectancy and advances in health policy, chronic systemic diseases and non-carious cervical lesions that predispose to dentin hypersensitivity have all become more common (Favaro Zeola *et al.*, 2019). Although dentin hypersensitivity and chronic systemic diseases both negatively affect QoL (Megari, 2013; Goh *et al.*, 2016; Vu *et al.*, 2022), no study has linked these conditions. However, both independently reduce physical, emotional, and social well-being, suggesting a potentially compounded effect when they occur together. Chronic systemic diseases often necessitate medications and lifestyle changes that may exacerbate oral health issues including dentin hypersensitivity. Similarly, dentin hypersensitivity impairs daily activities, such as eating and speaking, further affecting oral health-related QoL. This study aimed to explore the combined impact of dentin hypersensitivity and chronic systemic diseases on QoL. By examining this overlap, we sought to provide insights that could improve the clinical management of patients with both conditions.

A qualitative exploration of barriers and facilitators to inclusion of dentistry in a regional shared health care record

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Objectives: To explore stakeholders' perceived barriers and facilitators to the inclusion of dental services in the Great North Care Record (GNCR) by identifying the stakeholders, exploring their perspectives and using the findings to inform integration of dental services in GNCR. **Methods:** Qualitative online interview study with inductive thematic analysis. **Results:** Twelve stakeholders identified through purposive sampling participated. Five key themes were identified: information accuracy, efficiency, safety and security, value of records and optimal GNCR design. Inclusion of dentistry in GNCR was favoured to improve information accuracy and efficiency. However, participants raised concerns about how information accessed would be handled safely and worries about intraprofessional criticism within dentistry. Others saw a real value in including dentistry in the GNCR. **Conclusions:** This study demonstrates support for the inclusion of primary care dentistry in the GNCR, provided that the data are used responsibly, and that the system aids information safety and efficiency.

Keywords: *qualitative research, data sharing, oral health services*

Introduction

Health and care services are increasingly provided by a broad range of different intra- and inter-organisational teams, and the National Health Service in the United Kingdom is no exception. The sharing of clinical information between teams can help to prevent deficiencies in quality of care that can arise when patient care is shared or transferred between providers, through aiding communication, sharing results from clinical investigations and procedures and adding detail to patient histories (Coleman, 2003).

The Great North Care Record (GNCR) is a regional shared healthcare record that allows health and care professionals to view and contribute to patient records across North Cumbria and the North East of England. GNCR was introduced in line with NHS England's intentions to join up health and care data for professionals to make faster and better decisions for their patients based on a more complete health data (NHS England, 2018a, 2018b). Currently this sharing of data integrates the care of approximately 3.6 million people in the region with records being accessible in a range of settings: hospitals, general medical practice, mental health services, ambulances, adult social care and out of hours emergency services (Great North Care Record, 2022).

Whilst tertiary (hospital-based) dental care services in the North East and Cumbria can access the GNCR information, primary and secondary dental services, as well as out-of-hours dental services, cannot access or contribute to the GNCR. The inclusion of dental services in the GNCR could offer benefits to both patients and staff, as outlined above.

The option for one-way inclusion of dentistry, whereby dental teams could view the shared healthcare records or

two-way inclusion, whereby dental records would also form part of the shared records, is possible, though it remains unclear what stakeholders' perceptions of these approaches would be. For these reasons, it is of paramount importance to explore the views of all stakeholders to understand the barriers and facilitators to the integration of dentistry into the GNCR.

The aim of this study was to explore stakeholders' perceived barriers and facilitators to the inclusion of oral healthcare in the Great North Care Record. The specific objectives were as follows:

- Identify relevant stakeholders in the inclusion of dentistry in the GNCR
- Explore their perceptions on the potential integration of dental services into the GNCR
- Identify barriers and facilitators to integration of dental services into the GNCR through qualitative analysis
- Use these themes to inform future integration of dental services into the GNCR

Methods

This study used online qualitative interviews with inductive thematic analysis (Braun and Clarke, 2021). This manuscript has been written in accordance with the consolidated criteria for reporting qualitative research (COREQ) checklist (Tong, Sainsbury, and Craig, 2007).

Ethical review and approval was provided by Newcastle University Ethics Committee (reference: 27696/2022).

An initial discussion between members of the research team identified the key stakeholder groups who would have an interest in dentistry being included in the GNCR. Participants were purposively sampled from these stakeholder groups, including dental professionals

Ethnic Inequalities in the Functional Dentition Among British Adults: A Multilevel Analysis

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Objective: To explore the role of socioeconomic factors, area deprivation and behaviours in explaining ethnic differences in the functional dentition among East London adults using multilevel modelling. **Methods:** Data from a community-based health survey in East London included information on 1898 adults aged between 16 to 65 years old and belonging to 9 ethnic groups. Supervised questionnaires gathered information on demographic characteristics, socioeconomic indicators, dental behaviours and area deprivation (IMD 2007). A functional dentition was defined as having all 6 anterior plus at least 4 posterior contacts in clinical examination. **Results:** The multilevel logistic regression showed that Black Africans were 75% (95%CI: 1.21-2.52) and Black Caribbean 77% (95%CI: 1.05-2.98) more likely to have a non-functional dentition than White British participants in fully adjusted models. Other factors associated with a non-functional dentition were older age and no educational attainment. **Conclusion:** Black adults are at greater risk of non-functional dentition independently from sociodemographic characteristics, oral health-related behaviours and area-level characteristics. Proportionate universalism could be effective in reducing these health gaps.

Keywords: functional dentition, ethnic inequalities, multilevel approach

Introduction

In the United Kingdom (UK), ethnic inequalities in oral health are difficult to elucidate because they vary according to the condition studied, and minority ethnic groups do not necessarily exhibit worse oral health than the host population (Arora *et al.*, 2016; Delgado-Angulo *et al.*, 2016a,b; Delgado-Angulo *et al.*, 2019). Despite the decline in the prevalence of tooth loss, ethnic inequalities persist (Kassebaum *et al.*, 2014). A national study showed that Asian groups were less likely to have lost all their teeth (Delgado-Angulo *et al.*, 2019) whereas a population survey in East London showed that Asian and Black groups had fewer missing teeth than White British adults (Delgado-Angulo *et al.*, 2016a). Furthermore, the 2009 Adult Dental Health Survey reported that Asian adults were less likely to have a non-functional dentition when compared to White adults, but no differences were noted between Black and White adults (Arora *et al.*, 2016).

It has been suggested that ethnic inequalities are related to several factors that are specific to ethnic minorities, including socioeconomic and behavioural factors (Arora *et al.*, 2016; Bastos *et al.*, 2018; Dressler *et al.*, 2005). These characteristics explain the observed differences between ethnic groups only to a certain extent (Celeste *et al.*, 2013; Delgado-Angulo *et al.*, 2019; Nazer and Sabbah, 2018), suggesting that other factors may underlie the differences. Area deprivation is one of those factors, as it has been reported that the circumstances of the area where people live may affect their health independently of individual socioeconomic position (Becares *et al.*, 2012; Diez Roux, 2016; Phelan and Link, 2015). Ethnic minorities are usually overrepresented in deprived areas,

often characterised by higher crime levels and poor physical environment characteristics (Diez Roux, 2016), a fact that contributes to exacerbate existent ethnic health inequalities (White *et al.*, 2012).

Tooth loss is believed to result from the cumulative interplay between determinants at different levels (Tiwari *et al.*, 2016). Hence, identifying the factors play a larger role in shaping ethnic inequalities is fundamental to inform the development of social and health policy to improve equity efforts and decrease disease burden. With that in mind, the aim of this study was to explore the role of socioeconomic factors, behaviours and the contribution of area deprivation in explaining ethnic differences in the functional dentition among English adults using a multilevel approach.

Method

This study used a secondary data analysis of the East London Oral Health Inequality (ELOHI) Study, which included adults aged between 16 to 65 years old who lived in Dagenham, Waltham Forest, or Redbridge and Barking between 2009 and 2010. These areas were selected because of their ethnically diverse and socially deprived populations, which aids the understanding of oral health inequalities. The study protocol was approved by the Outer Northeast London Research Ethics Committee (08/H0701/93) (Delgado-Angulo *et al.*, 2016a,b).

In multistage stratified random sampling, the sampling frame was a list of all the addresses stratified by the number of wards in Barking and Dagenham, Redbridge and Waltham Forest (17, 21 and 20 respectively). Fifty-five addresses per ward were randomly selected, 3193 in