Title: Embracing health in older age: older people matter

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Key Points

- There is an increasing prevalence of chronic oral disease in older adults and access to care is challenging for those who are semi- or fully-dependent
- As the discussion on “universal healthcare” progresses, priorities for dealing with the oral disease burden need to be set
- Greater collaboration between professional and patient stakeholders is needed to co-design dental care strategies for discussion with policymakers

Abstract

Introduction: The proportion of older adults over 65 years of age is increasing across the UK and Republic of Ireland and projected to reach 25% of the population by 2050. There is a high prevalence of dental disease in older adults and this is complicated by medical and social circumstances. *Aim*: The aim of this paper is to describe the oral health challenges that older people present and provide an overview of recent studies that have sought to promote oral health in older adults. *Discussion*: The oral health needs of older people have changed considerably over the last twenty years, with most now dentate or partially dentate with a high burden of repair and replacement of restored and missing teeth. This presents an unprecedented burden to the health system, and continued reliance on the existing curative model of oral healthcare is not realistic. There is an urgent need to shift the focus away from treatment to prevention of disease across the lifecourse. Barriers to care for older adults, particularly those who are medically compromised or living in care homes, include mode of remuneration and lack of confidence among primary care dentists to provide domiciliary care to older patients. There is a need for more inter-professional care for older adults, which requires an integrated effort between the stakeholders, including healthcare funders, professionals and patient advocacy groups as we prepare to meet these challenges. Recently developed training initiatives to upskill the dental workforce and develop evidence for care in nursing homes are presented in this paper. *Conclusion:* There is an urgent imperative to educate and empower the population to further reduce the prevalence of dental disease across the life course. More work is needed to develop the future workforce to manage care needs of an increasingly diverse older adult population.

Introduction

The number of older people [i.e., over 65 years of age] in England and Wales now exceeds 11 million, in Scotland this figure is over one million and in Northern Ireland close to 350,00.[1-3] This represents 18.6%, 20.3% and 18.1% of the total respective populations. Over the next twenty-five years these proportions are expected to rise further, exceeding 25% by 2050. In the Republic of Ireland, the number of people aged 65 years and over is estimated to have risen by over 40% between 2013 and 2023, from 569,000 to 806,000, and is expected to double again to 1.6 million by 2051.[4] As life expectancy has increased in many countries, the burden of chronic disease has also grown. The global focus on health policy direction has gradually transitioned from improving life expectancy to promotion of "healthy" aging.[5] In so doing, a key policy objective is to reduce the burden of chronic disease by taking a life course perspective to health promotion and ultimately improve population health among older adults.

Older people are a heterogenous population group and can be differentiated into: "young-old" and "old-old" based on their age, "healthy" or " medically compromised" based on their general health, "strong" or "frail" based on their physical condition, "advantaged" or " disadvantaged" based on their economic status, "community-based" or "in residential care" based on their residence, "independent" or "dependent" based on their self-care ability, "dentate" or "edentulous" based on the possession of any natural teeth. Age in itself should not determine care pathways, and patients' medical and social circumstances are important determinants of oral health and treatment outcomes. For instance, a patient can be chronologically advanced in years but living independently and in good health. The type of oral healthcare for this type of patient is going to be quite different when compared to a medically compromised, dependent patient of similar age. Increasing age does not necessarily mean increasing dependence and many people over the age of 65 independently live full and active lives. Although the likelihood of having a disability increases with age, there is growing evidence of the differences between chronological and biological ageing and how the latter is expressed.[6] This means that dental public health approaches to promote ageing well must account for the range of people that are included within this age cohort. A 'one size fits all' strategy is not appropriate and policies should be tailored to account for these differences in biological ageing, risk factors, levels of independence and contexts. The majority of older people live completely independently, but some will experience increasing levels of dependence, which requires them to be either cared for at home, be part of a sheltered housing initiative or, be cared for in a care

home. The proportion of dependent older people living in care homes is relatively small (2.5-3.0%)[1-4], when compared to the number of people cared for within their own home. Older people may have substantive care duties for a partner or spouse. In England and Wales, half a million people provide 50+ hours of unpaid care. Equally, approaching one third of older people live alone and have limited social supports.[1] This makes the oral health needs of older people and the development of policies to promote ageing well, a matter of priority for dental public health.[7,8]

The aim of this paper is to describe the oral health challenges that older people (defined as 65 years and over) present and provide an overview of the recent empirical studies conducted in the United Kingdom that have sought to promote oral health in this heterogenous population group.

The burden of oral conditions in older adults

The oral health needs of older people have changed considerably over the last twenty years.[9] The prevalence of edentulousness has dramatically fallen, and the majority of older adults are now either dentate or partially dentate. This creates a number of challenges including: 1. Increasing prevalence of dental coronal and root surface caries, chronic periodontal disease and toothwear[10]; 2. Cumulative impacts of repair and replacement of restored teeth; 3. Diminished oral health related quality of life associated with untreated oral disease and extensive toothloss[11,12]; 4. Increasing oral health inequalities at a population level.[13] This presents a formidable challenge and unprecedented burden to the health system, and continued reliance on the existing curative model of oral healthcare is not realistic. There is an urgent need to shift the focus away from treatment to prevention of disease across the lifecourse, and as the discussion on “universal healthcare” progresses, priorities for dealing with the high disease burden in older adults need to be set.

Despite the relatively high levels of older people who are fit and well, the prevalence of chronic medical conditions in this population group does increase with age. Levels of coronary vascular disease, respiratory diseases and diabetes are increasing and have an associated social gradient, which means that many older people with high levels of oral health need, also have high levels of underlying morbidity due to the common risk factors, including poverty, smoking and diet.[9] In terms of dental disease, the Adult Oral Health Survey 2023 reported that 44% of dentate adults aged 65-74 years and 43% of those aged 75 years and older had tooth decay affecting the dentine.[14] Overall, there were large

increases in the prevalence of decay since the previous national survey in 2009, particularly among those aged 65-74 years (from 21% in 2009 to 44% in 2023, an increase of 23 percentage points). When older people enter residential care due to a loss of independence, these figures increase further, such that oral health needs amongst residents can approach three times the levels found in their community dwelling peers.[15] Treatment of dental disease and tooth loss in older adults should take into account the patient's capacity for self-care and maintenance. Alternatives to complex care may provide a functional rather than complete dentition, with lower burden of maintenance than complex restorative care. For instance "minimal intervention dentistry" [MID] has been promoted for older adults, particularly those with special care needs .[16] A review of relevant studies has indicated positive outcomes for oral health and patient acceptance of MID and the use of atraumatic restorative treatment [ART][17]. Risk stratification and early implementation of primary prevention strategies [e.g. tailored oral hygiene advice; appropriate use of high concentration fluoride toothpastes or varnishes or 38% silver diamine fluoride] are known to reduce caries incidence in older adults with moderate to high risk of root caries.[18]

However, successful scaling up of primary prevention strategies is predicated on timely interaction between dental care professionals and the older adults. As our population ages, there is an urgent need to develop patient-centred, prevention focussed services to replace the "disease treatment" model of care. There is a need to better understand the factors which influence demand for care among older adults, and, their experience with dental services. Costs of dental care are certainly a potential barrier, but this is not the dominant barrier for all older adults. A number of authors have published studies which suggest that cost-related non-attendance is relatively low in older adults.[19,20] However, for older adults with lower levels of educational attainment, lower socio-economic status and high burden of chronic disease, concern regarding cost of care was indeed a barrier to seeking dental care.[21] Beaven and Marshman conducted a scoping review of barriers and facilitators of accessing oral healthcare for older adults in the UK.[22] In addition to costs of care, further barriers included fear/dental anxiety, mobility issues and logistic challenges accessing dental surgeries, negative perceptions of dental services, lack of awareness of dental health and lack of perceived need to see an oral healthcare professional. Current evidence suggests that reducing the cost of dental care alone will not be sufficient to increase older adults attendance for dental care.

Access to care for older adults

Care pathways for older adults should be based on four principles, namely “Acceptability”, “Accessibility”, “Affordability” and “Appropriate care”. This has been discussed in greater detail in the proposed “Seattle care pathway” for securing oral health in older adults.[23] The level of dependency of older adults influences the accessibility to dental care. So called “robust” older adults, namely, those who are medically fit and well and live independently, expect to be guided by healthcare professionals and be equal stakeholders in clinical decision making about their care.[24] They also have a strong preference for conservative and restorative dental care as opposed to extraction of teeth. Semi-dependent older adults (I.e., those who need some assistance with daily tasks, including transport to and from dental appointments] may experience barriers to dental care and may not be able to maintain complex restorations if provided. Those adults whose medical and social circumstances mean they become fully-dependent have major challenges in accessing dental care and have a high burden of dental disease.

As the population ages and needs become more complex, ideally, there should be a shared care approach across primary and specialist care.[8] However, evidence suggests that those with multiple co-morbid conditions experience challenges accessing dental care in primary care/general dental practice settings.[25-27] The medical and social circumstances of such patients warrant multi-disciplinary input and co-ordinated inter-professional care. This is not well catered for in current service delivery and remuneration models of primary dental care, and older adults with co-morbidities often rely on the community services as “special care” needs patients. Many older adults report concern about cost of care, challenges in travelling to appointments and influence of previous negative experiences with dental care.[22] There is also concern among primary care dentists about their confidence and capability to undertake dental treatment for older adults with medical conditions[28] and for those in residential care.[29]

Further work is needed to design a system with sufficient enablers and facilitators that would increase accessibility and acceptability to oral health care services. As health systems try to shift the needle away from treatment towards prevention of disease, work is needed to create a value proposition for this among older adults. Experience elsewhere would suggest that willingness to pay [WTP] for prevention oriented primary care is mixed. More affluent and better educated older adults are more willing to pay than those in lower socio-economic groups with high disease burden, but much less than market rate for prevention and dental check-ups .[30,31]

The level of remuneration for care of older adults with co-morbid conditions and special needs is another potential barrier to access and provision of good quality care. It is debatable whether current remuneration mechanisms are adequate or appropriately incentivise primary care dentists to provide patient centred, prevention oriented oral healthcare. Remuneration for primary dental care has largely been driven by treatment of disease [eg, fee per item payments]. Some countries have tried to reduce the impact of financial cost on access to care of older adults, but there are limited evaluations of such policies. For example, direct transfers to low-income adults in Japan found no positive impact on dental attendance, while a discount of co-payments (i.e. an indirect economic approach) increased oral health service utilisation and did this primarily for dental check-ups among the same population. [32,33] In Singapore, universal government dental care financial subsidies for adults born on or before 1949 has substantially increased the odds of regular dental attendance.[34] This is particularly the case for better educated and those on the upper tiers of socio-economic status. The WHO (2023) has called for oral health to be included in future universal insurance schemes and there is a need to determine how best to achieve this for older adults and thus lower the cost of care.[35]

A further key question that needs to be addressed: when does dental care for an older adult go beyond the scope of primary care and fall into the remit of “special needs”, whereby dental care is complicated by medical and/or social circumstances? The recently updated EU Directive on minimum training and requirements for dental practitioners (EU Commission, 2024) specifically refer to the need for training in “gerodontology” and “interprofessional collaborative care”.[36] It is debatable whether graduating dentists have sufficient training in care of patients with special care needs given the densely packed nature of the undergraduate curriculum in dental schools.[37] This is an area which requires an integrated effort between the stakeholders, including dental schools, regulators, healthcare funders, professional representative bodies and patient advocacy groups as we prepare to meet the challenges of a rapidly growing and more diverse older population. There are examples in the UK of additional training initiatives to equip dentists to provide domiciliary care for older adults with special needs. In Scotland, this is through enhanced skills practitioner – domiciliary care training, whereby the taught element for this is organised through NHS Education for Scotland via the Turas portal and skills mentoring by specialist clinicians in the public dental service.[38] Further efforts are needed to scale up skills and workforce capacity [both healthcare and social care] along these lines as the population ages[8].

The role of Telehealth

There has been growing interest in the use of technology to deliver healthcare and education, and this accelerated during the COVID-19 pandemic. "Teledentistry" is defined as "the remote provision of dental care, advice, or treatment through the medium of information technology, rather than through direct personal contact with any patient(s) involved".[39] . Teledentistry may increase access to healthcare advice and education for older adults, particularly those who are semi- or fully-dependant. A recent scoping review suggests that teledentistry has worked reasonably well when used for teleconsultations and advice, but there are too few studies as yet to make firm recommendations on its implementation and use.[40] There are a number of logistical challenges to consider and address when developing policy for the use of technology for dental services. The WHO has published an implantation guide for mobile technologies for oral health.[41] This document provides guidance on use of mobile technologies for improving health literacy, training, detection and surveillance.

Recent initiatives for older semi-dependant and dependant adults

Guidelines have been developed by a number of authorities to foster longer, healthier lives and 'ageing well'. More broadly, the World Health Organisation has sought to: 1. Change how we think, feel and act towards older people; 2: Develop communities that foster the abilities of older people; 3. Deliver person-centred integrated care; and 4. Provide older people with access to quality long-term care when required.[8,35] Specifically for oral health, the European College of Gerodontology and the European Geriatric Medicine Society, identified three main policy areas: education for healthcare providers, health policy action plans, and citizen empowerment and involvement.[42]

What appears to be missing is an explicit recognition of the NHS services needed as older people transition between independence and dependence. Whilst older people are still able to attend local NHS dental service provision, "Delivering Better Oral Health" recognises the increased risk of dental disease for 'mentally and physically frail older people'.[43] The SDR in Scotland gives an enhanced capitation payment for all registered patients over the age of 65, and the ability to claim an additional payment when an appointment takes at least double the time it would usually take for a patient of the same age, under the Additional Support Needs capitation payment. However, in both current contract consultation processes for England and Wales, there is no explicit recognition of the additional surgery time that older people may require and how General Dental Services should be better linked to Community Dental Services, to manage an older

person's transition to care as they lose their independence and are either cared for at home or cared for within a home. There have been efforts in Scotland to address this in the "Caring for Smiles (dependent older people)" initiative (Box 1).[44] In this programme, there is a prompt for staff to consider individual abilities "prompt-encourage-support", so that those who can look after their own mouth care are prompted to do so, those who need a bit more encouragement are given this and then moving on to support and recognising when that move from independence to dependence occurs.

Little is known about the oral health needs of those being cared for at home, but the oral health needs and service provision within care homes is characteristically poor.[8,45,46] To this end, there have been a number of initiatives across the United Kingdom to promote oral health in care homes. Public Health England developed a toolkit and guidance on commissioning better oral health for vulnerable older people[47,48] and the National Institute for Clinical and Care Excellence produced NG48.[49] A number of population-based programmes have been in place for a number of years in both Scotland (Caring for Smiles (dependent older people))[44] and Wales [Gwên am Byth] [50]. Both offer training and support to improve the oral health of residents. In Wales, they ensure an up-to-date mouth care policy is in place in each care home and that residents have a mouth care assessment and individual care plans to ensure timely access to appropriate dental care and treatment when required. However, a common problem with many of these guidelines is the weak evidence base, when compared to other population cohorts. For example, NG48 has not been updated since 2016. This issue was highlighted recently by a review of the literature.[51] The 30 included trials in this review had a low certainty of evidence, poor study quality and imprecision. The same lack of evidence was found by Stark *et al*[52] who found 'a clear gap in the research around interventions designed to be used by community nurses to improve oral health care for people receiving care in their own homes'. There is a lot of work still to do to strengthen the evidence base for this care. However, there are a lot of positives from these programmes, including the large number of health & social care staff they have engaged with.

To ensure future approaches are grounded in the perspectives of older people as they lose their independence, co-design approaches have been used to explore appropriate interventions.[52-56] All have shown the importance of ensuring any resources 'fit' with the context and link to the values and beliefs of the staff who deliver them. In both a care home environment and for those living at home, lack of formal dental training, lack of time

and the opportunity cost of providing oral care versus other pressing health needs have all been highlighted as barriers to oral care.[56-58]

FINCH was a randomised clinical trial of an investigative product[59,60], and looked at the feasibility of fluoride varnish and 2800ppm fluoride toothpaste in six mixed residential and nursing care homes. Residents were risk assessed based on dependency, dentition status and self-care abilities and randomised at care home level to a fluoride intervention. Clinical dental assessments were undertaken at 3 data points over the intervention delivery period. 118 residents across six care homes participated in the programme, which was interrupted due to the Covid19 pandemic, with only 56 (50%) of the 113 that received the interventions recruited residents completing the 12-month preventative programmes. Despite the challenges in retention of participants, this study provides evidence of the efficacy of non-invasive, professionally applied high fluoride regimes in dependent older adults with high risk of dental decay.

In the TOPIC study[61], 22 care homes took part in a pragmatic cluster randomised controlled feasibility study across London and Northern Ireland. A complex intervention co-designed with care home staff and based on NG48 consisted of: a care home staff training package; Oral Health Assessment Tool administered by trained care home staff; and a support worker assisted twice daily tooth-brushing regimen with 1500 ppm fluoride toothpaste. One-hundred-and-nineteen residents from 22 care homes were recruited and 82 residents from 19 care homes completed the study (retention: 86% for care homes and 69% for residents). Twenty residents were lost to follow-up and another 17 withdrew throughout the study. Data completion rates ranged between 88% and 97% at baseline and between 91% and 96% at the 12-month follow-up. Intervention fidelity records showed high completion rates for oral care plans (90%), and lower rates for weekly oral hygiene records (73%) and the OHAT (61%).

Two further large-scale trials are about to formally report at the time of writing: SENIOR and REFLECT[62,63]. SENIOR was a pragmatic cluster-randomised controlled trial to determine whether Dental Therapists (DTs) and Dental Nurses (DNs) could improve the oral health of dentate older adults over 65 years-of-age residing in care homes. 48 care homes and 268 residents were recruited across London, Northern Ireland, Northwest of England and Wales. DTs in the active arm provided routine dental care and DNs professionally administered fluoride varnish, oversaw the use of high-strength fluoride

toothpaste (5,000ppm), supervised toothbrushing and acted to facilitate the delivery of oral health messages in the setting, using materials developed from TOPIC based on NICE guidelines. This was compared to 'treatment as usual' in the control arm. SENIOR showed no statistically significant effect in the Primary Outcome Measure (plaque levels), but some of the Secondary Outcome Measures appeared to favour the preventive intervention .[64]

REFLECT was a pragmatic randomised controlled trial involving adults aged 50 years and above attending NHS dental practices identified by their dentist as having high risk of dental caries. 1,200 participants were targeted from 60 dental practices in England, Scotland and Northern Ireland. Participants in the active intervention arm were provided with 5,000ppm toothpaste. Early data from this study are expected to be available shortly.

Future Directions

Given the significant care need burden with a rapidly aging population, there is an urgent imperative to educate and empower the population to further reduce the prevalence of dental disease across the life course. There is still a lot of work to be done but there are examples referred to in this paper where efforts have been made to develop relationships with a range of organisations and services, and spreading the message of the importance good oral care for oral health and general health. Ideally, the dental professional stakeholders will work more collaboratively with patient stakeholders to co-design care pathways and implementation strategies for discussion with policymakers. This becomes particularly important when developing care priorities to ensure that preventive dental care is appropriately catered for in any future universal health coverage schemes.

Further efforts are needed to improve access to care for older adults, especially those with special needs and who are semi- or fully dependent. Leveraging technology such as tele-dentistry for virtual consultations and advice and use web - based applications for health promotion may provide additional access possibilities for prevention initiatives. More work is needed to develop the workforce model to manage care needs of an increasingly diverse older adult population, in tandem with models of care delivery and remuneration systems that are fit for the purpose of improving population oral health of older adults.

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Ethics Declaration

None of the authors have any conflicts of interest to declare.

Author contributions statement

FA and PB drafted the manuscript; LD provided detail of the Caring for Smiles (dependent older people) initiative; GT, GMcK and RP provided details of the TOPIC, SONIC and FINCH studies. All authors contributed to drafts of the manuscript and approved the final submitted version.

Figure legends

Box 1: “Caring for Smiles (dependent older people)” initiative in Scotland

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