Approaches for adult nursing and residential care homes on promoting oral health, preventing dental health problems and ensuring access to dental treatment

Draft Review 3: Barriers and Facilitators

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APPENDICES (in separate document)

EXECUTIVE SUMMARY

1 Introduction

1.1 Aim

To review the evidence about approaches, activities and interventions that promote oral health, prevent dental problems and ensure access to treatment for adults in care home settings.

1.2 Review question

What helps and hinders approaches to promote and protect oral health and access to dental check-ups and treatment in care homes?

1.3 Background

According to Age UK (2014) calculations, in April 2012 there were 431,500 adults in residential care of whom approximately 414,000 (95%) were aged 65 or over. The 2011 Census reported there were 172,000 people aged 85 years or over living in care homes. Of these individuals, 103,000 were living in a care home without nursing and 69,000 in a care home with nursing.

While the majority of care home residents are older people, there is a cohort of those aged 18-65, who are in residential care because their physical or mental health prohibits them living independently. From the Age UK data, it might be assumed that there were 17,500 such individuals in care, but Emerson et al. (2013) stated that the number of people with learning disabilities in residential care in England at 31 March 2012 was over 36,000 of whom just under 6000 were aged 65 or over.

Successive Adult Dental Health Surveys have shown that people are keeping their teeth for longer (Fuller et al. 2011). The ravages of dental decay in the early to mid-twentieth century, together with the then prevailing attitude to oral health meant that many people had all of their teeth extracted when young. However, as attitudes to dentistry changed, the availability of dental care increased, dental technology improved and most importantly fluoridated toothpaste became widely available, the proportion of adults in England who were edentate (no natural teeth) has fallen by 22 percentage points from 28 per cent in 1978 to 6 per cent in 2009 (Fuller et al. 2011). Even amongst those aged 85 years or older, 72% still had some of their own teeth, the average number being 14 teeth (Fuller et al 2011).

Together these trends mean that in the coming years, not only will there be more older people, a proportion of whom will live in care, the vast majority will have some or indeed all of their own teeth. In part, that many have retained their own teeth is as a result of dental treatment and restorative care. Complex and expensive dental work including crowns, prostheses, implants and bridges are likely to become increasingly prevalent in care home residents. This poses a much greater preventive and dental care challenge than that associated with the older person who has lost all their own teeth and who may or may not be wearing a complete denture (British Dental Association, 2012).

Cognitive and physical disabilities may preclude effective mouth care and this is especially so in those in residential care who may be totally dependent on carers to assist with or clean their teeth and/or dentures. As a result the incidence of oral diseases in care home residents tends to increase (Naorungroj 2013). This may happen prior to individuals entering residential care and may be exacerbated by medications that cause dry mouths (SA Dental Service 2009).

The National Institute for Health and Care Excellence (NICE) has been asked by the Department of Health to develop a public health guideline for carers working in health and social residential care settings (including nursing homes and residential care homes) on effective approaches to promoting oral health, preventing dental health problems and ensuring access to dental treatment when needed.. This review is the third of three reviews developed by this team to inform the guidance. It considers barriers and facilitators. Review 1 examined the effectiveness of interventions and Review 2 considered best practice, as defined by local, national and international guidance documents.

2 Methods

A systematic review of quantitative and qualitative research to address the above question was undertaken. A wide range of databases and websites was searched systematically, supplemented by identification of grey literature[2]. Searches were carried out to identify relevant studies in the English language published between 1995 and September 2014. A range of supplementary methods including a call for evidence by NICE, contacting authors, reference list checking and citation tracking were also utilised to identify additional research.

[2] Technical or research reports, doctoral dissertations, conference papers and official publications.

Quantitative and qualitative research that reported the views and perspectives of service users and providers were included. To ensure a high degree of applicability to UK settings, inclusion was restricted to the following countries/regions: the USA, Canada, Western Europe, Australia and New Zealand. Applicable countries were identified by oral health experts in the review group and agreed with NICE.

Study selection was conducted independently in duplicate. Critical appraisal was carried out using appropriate checklist from the methods for the development of NICE public health guidance (NICE 2012). Critical appraisal and data extraction of all documents were undertaken by one reviewer and checked by a second, with 10% of papers being considered independently in duplicate, and any differences resolved by discussion.

A narrative summary of the evidence was completed and is presented with a table of findings.

3. Results

Sixty three studies (reported in 67 papers) were included. These provided data that met the inclusion criteria for this review.

Study designs comprised 45 cross sectional surveys, 15 qualitative studies (one of which employed mixed methods), and three intervention studies (one randomised controlled trial, one controlled before and after study and one uncontrolled before and after study) incorporating findings on participant views.

In general, study quality was moderate to high with 16 studies deemed to have high quality (++), 37 studies being of moderate quality (+) and 10 studies of low quality (−).

The majority of studies were based in elderly care homes with just two studies in homes for adults with disabilities.

From analysis of the included studies, 11 major themes emerged. These themes, which are detailed in Evidence Statements (ES) 1-11 below were broadly grouped into views on the importance of:

- Care home staff skills, knowledge and attitudes (ES 1-3)
- Care home organisation, policy and resources (ES 4-5)
- Professional dental team involvement, resources and attitudes (ES 6-7)
- Support from family, friends and other residents (ES 8)
- Residents' behaviour, health, attitudes and access to resources (ES 9-11)

4. Evidence Statements

Evidence Statement 1: Care home staff knowledge and skills in oral health care

Knowledge and/or skills to provide oral hygiene care amongst care home staff was considered to influence oral health care of residents in 33 studies[1-33]. 10 qualitative studies [4 (++)[11,15,22,32], 5 (+)[3,4,10,13,21]), 1 (-)[12]], 20 cross-sectional surveys [4 (++)[16,23,25,31], 12 (+)[1,2,5,7-9,14,18,20,24,28,33], 4 (–)[6,17,29,30]], two controlled before and after [1 (++)[26], 1 (+)[27]]and one (+) uncontrolled before and after study[19].

Of these, 16 studies[3,7,9-12,15-25,33] described the presence or improvement of knowledge and skills as a facilitator for care and 31[2-31,33] described its absence as a barrier to care. Knowledge and skills that were considered helpful were care techniques and strategies for providing care when faced with difficult and resistant behaviours.

A lack of knowledge and skills amongst care home staff was described as a barrier to care home residents **accessing professional dental care** in nine studies[1,6,9,12,14,15,20,24,29]. Sufficient or improved dental or oral health knowledge and skills was considered to enable dental care access in six studies[2,10,13,16,20,24] . Oral health knowledge and skills relevant to dental care access included the identification of oral health conditions and how to access dental services.

The evidence is applicable to care homes in the UK since three studies were conducted in the UK[6,24,33] and the remainder were in countries with similar settings.

[1] Chalmers et al. Australia 2001 (+); [2] Chung et al. Switzerland 2000;[3] Dharamsi et al. Canada 2009 (+); [4] Finkleman et al. Canada 2013 (+); [5] Forsell et al. Sweden 2010 (+); [6] Gately et al. UK 2011 (–); [7] Jablonski et al. USA 2009 (+); [8] Jobman et al. USA 2012 (+); [9] Johnson and Lange USA 1999 (+); [10] Lindqvist et al. Sweden 2013 (+); [11] MacEntee et al. Canada 1999 (++); [12] Maramaldi and Cadet, USA 2014 (–); [13] McKelvey et al. New Zealand 2003 (+); [14] Nunez et al. USA 2011 (+); [15] Paley et al. Australia 2009 (++); [16] Paulsson et al. Sweden 2003 (++); [17] Pyle et al. USA 2005 (–); [18] Rabbo et al. Germany 2010 (+); [19] Reed et al. Canada 2006 (+); [20] Schembri and Fiske Malta & Gozo 2005 (+); [21] Sonde et al. Sweden 2011 (+); [22] Tham and Hardy Australia 2013 (++); [23] Thole et al. USA 2010 (++); [24] Turner et al. UK 2009 (+); [25] Vanobbergen and De Visschere Belgium 2005 (++); [26] Wårdh et al. Sweden 2000 (++); [27] Wårdh et al. Sweden 2002a (+); [28] Wårdh et al. Sweden 2012 (+); [29] Webb et al. USA 2013a (–); [30] Webb et al. USA 2013b (–) ; [31] Willumsen et al.Norway 2012 (++); [32] Yoon et al. Canada 2011a (++); [33] Young et al. UK 2008 (+)

Evidence Statement 2: Attitudes of care home staff to oral health

Forty six studies contained views on the attitudes of care home staff and their influence on oral health care for residents[1-45]. 13 qualitative studies [4 (++)[17,23,25,34], 8 (+)[6,7,16,20,33,20,42,45],
1 (-)[18]], 29 cross-sectional surveys [5 (++)[24,26,35,37,43], 18 (+)[2,3,4,5,9,12-15,21,22,28,31,32,36,41,44,46], 6 (–)[10,11,19,27,30,38]], one survey within a (++) RCT[8], one (+) mixed methods[1], one (++) controlled before and after study[39] and one (+) uncontrolled before and after study[29].

Negative attitudes amongst care home staff, were described as barriers to the provision of oral care for residents in 36 studies[2,4,6-11,13-16,18,20,22-27,29,32-46]. Negative attitudes included a dislike of oral care provision to residents, a sense of violation of the resident, difficulty and a lack of priority or willingness to undertake oral health care.

Positive attitudes or the absence of negative attitudes were described in 21 studies as being facilitators of oral care[2,5,6,10,13,15,16,18,23-25,27,29,31-34,36,37,45,46].

Attitudes in relation to **dental care access** were a theme in 17 studies[1,3,4,11,12,15,17-19,21-23,25,28,30,36,45]. Negative attitudes were identified as a barrier to dental care access in all 17 studies[1,3,4,11,12,15,17-19,21-23,25,28,30,36,45]. These included a low sense of priority towards dental treatment and difficulties in finding and getting residents to dental care. Positive attitudes or a lack of negative attitudes associated with dental care access were identified in 12 of these studies.[1,3,12,15,18,21,23,25,28,30,36,45]. Facilitators included finding it easy to access dental care, and a sense of importance of dental care.

The evidence is applicable to care homes in the UK since eight studies were conducted in the UK[1,10-12,25,31,36,46] and the remainder were in countries with similar settings.

[1] Belsi et al. UK 2013 (+); [2] Chalmers et al. USA 1996 (+);[3] Chalmers et al. Australia 2001 (+); [4] Chung et al. Switzerland 2000 (+); [5] Cornejo-Ovalle et al. Spain 2013 (+); [6] Dharamsi et al. Canada 2009 (+); [7] Finkleman et al. Canada 2013 (+); [8] Fjeld et al. Norway 2014 (++); [9] Forsell et al. Sweden 2010 (+); [10] Frenkel UK 1999 (–); [11] Gately et al. UK 2011 (–); [12] Hally et al. UK 2003 (+); [13] Jablonski et al. USA 2009 (+); [14] Jobman et al. USA 2012 (+); [15] Johnson and Lange USA 1999 (+); [16] Lindqvist et al. Sweden 2013 (+); [17] MacEntee et al. Canada 1999 (++); [18] Maramaldi and Cadet USA 2014 (–); [19] Matear and Barbaro Canada 2006 (–); [20] McKelvey et al. New Zealand 2003 (+); [21] Nitschke et al. Germany 2010 (+); [22] Nunez et al. USA 2011 (+); [23] Paley et al. Australia 2009 (++); [24] Paulsson et al. Sweden 2003 (++); [25] Pratelli and Gelbier UK 1998 (++); [26] Pyle et al. USA 1999 (++); [27] Pyle et al. USA 2005(–); [28] Rabbo et al. Germany 2010 (+); [29] Reed et al. USA 2006 (+); [30] Reznick and Matear Canada 2002 (–); [31] Simons et al. UK 1999 (+); [32] Smith et al. USA 2010 (+); [33] Sonde et al. Sweden 2011 (+); [34] Tham and Hardy Australia 2013 (++); [35] Thole et al. USA 2010 (++); [36] Turner et al. UK 2009 (+); [37] Vanobbergen and De Visschere Belgium 2005 (++); [38] Vergona USA 2005

(–); [39] Wårdh et al. Sweden 2000 (++); [40] ; Wårdh et al. Sweden 2002a (+) [41] Wårdh et al. Sweden 2012 (+); [42] Wårdh and Wikstrom Sweden 2014 (+); [43] Willumsen et al. Norway 2012 (++); [44] Wolden et al. Norway 2006 (+); [45] Yoon and Steele Canada 2012 (+); [46] Young et al. UK 2008 (+)

Evidence Statement 3: Oral health education and training for care home staff

Eighteen studies described **training in oral health as relevant to oral health care**[1-18]. Four qualitative studies [2 (++)[8,12], 2 (+)[2,7])], 13 cross-sectional surveys [2 (++)[17,18], 5 (+)[1,2,6,11,14], 6 (–)[4,5,9,13,15,16]] and one (+) uncontrolled before and after study[10].

Inadequate, absent or a lack of **regular oral health care education** was described as a barrier to good oral care in 15 studies[1-8,11-18]. Oral health and care training was regarded as a facilitator in six studies[2,3,5,9,10,12]. Both theoretical and hands-on practical education was advocated. Training to overcome the specific barrier of **resistant behaviour** was highlighted in six studies[3,6,12,13,15,18].

A lack of oral care training for care home staff was also considered a barrier for **dental care service access** for residents in six studies[5,8,11,12,16,17] because staff were unable to recognise the importance of oral care, and therefore do anything about it.

The evidence is applicable to care homes in the UK since three studies were conducted in the UK[4,5,17] and the remainder were in countries with similar settings.

[1]Chung et al. Switzerland 2000 (+); [2] Cornejo-Ovalle et al. Spain 2013 (+);[3] Dharamsi et al. Canada 2009 (+); [4]Frenkel UK 1999 (–); [5] Gately et al. UK 2011 (–); [6] Jobman et al. USA 2012 (+); [7] Lindqvist et al. Sweden 2013 (+); [8] Paley et al. Australia 2009 (++); [9] Pyle et al. USA 2005 (–); [10] Reed et al. USA 2006 (+); [11] Smith et al. USA 2010 (+); [12] Tham and Hardy Australia 2013 (++); [13] Vergona USA 2005 (–); [14] Wårdh et al. Sweden 2012 (+); [15] Webb et al. USA 2013a (–); [16]Webb et al. USA 2013b (–); [17] White et al. UK 2009 (++); [18]Willumsen et al. Norway 2009 (++)

Evidence Statement 4: Care home organisation and policies for oral health care

37 studies described views on how **care home organisation and policies** affect oral health and dental care[1-37]. 13 qualitative studies [5 (++)[10,15,17,24,35], 7 (+)[3,4,8,12,23,31,36], 1 (–)[11]], 21 cross-sectional surveys [4 (++)[16,26,33,34], 12 (+)[1,2,6,7,13,14,19,21,22,25,30,37], 5 (–)[5,9,18,27,32]], two controlled before and after studies [1 (++)[28], 1 (+)[29]] and one (+) uncontrolled before and after study[20].

Organisation and policies included **care home routines and organisational policies** (36 studies)[1-29,31-37] and **communication and accountability** (22 studies) [2,3,6,8,10,19-31,33,34,36,37].

32 studies related these factors to oral care[1-12,15-20,22,23,25-37] and 24 related them to dental treatment care access[2,4-6,9,10,12-15,17-19,21-25,27-29,31-33].

Care home routines that included oral care and organisational policies that ensured regular oral care and dental checks were associated with improved oral care. Having good communication and clear accountability to ensure that policies were followed was associated with improved care and the absence of this was a barrier to care.

The evidence is applicable to care homes in the UK since 8 studies were conducted in the UK[5,6,9,13,17,25,33,37] and the remainder were in countries with similar settings.

[1] Chalmers et al. USA 1996 (+); [2] Chung et al. Switzerland 2000 (+);[3] Dharamsi et al. Canada 2009 (+); [4] Finkleman et al. Canada 2013 (+); [5] Frenkel UK 1999 (–); [6] Hally et al. UK 2003 (+); [7] Jablonski et al. USA 2009 (+); [8] Lindqvist et al. Sweden 2013 (+); [9] Longhurst UK 2002 (–); [10] MacEntee et al. Canada 1999 (++); [11] Maramaldi and Cadet USA 2014 (–); [12] McKelvey et al. New Zealand 2003 (+); [13] Monaghan & Morgan UK 2010 (+); [14] Nitschke et al. Germany 2010 (+); [15] Paley et al. Austarlia 2009 (++); [16] Paulsson et al. Sweden 2003 (++); [17] Pratelli and Gelbier UK 1998 (++); [18] Pyle et al. USA 2005 (–); [19] Rabbo et al. Germany 2010 (+); [20] Reed et al. USA 2006 (+); [21] Schembri and Fiske Malta and Gozo 2005 (+); [22] Smith et al. USA 2010 (+); [23] Sonde et al. Sweden 2011 (+); [24] Tham and Hardy Australia 2013 (++); [25] Turner et al. UK 2009 (+); [26] Vanobbergen and De Visschere Belgium 2005 (++); [27] Vergona USA 2005 (–); [28] Wårdh et al. Sweden 2000 (++); [29] Wårdh et al. Sweden 2002a (+); [30] Wårdh et al. Sweden 2012 (+); [31] Wårdh and Wikstrom Sweden 2014 (+);[32] Webb et al. USA 2013b (–); [33] White et al. UK 2009 (++); [34] Willumsen et al. Norway 2012 (++); [35] Yoon et al. Canada 2011a (++); [36] Yoon and Steele Canada 2012 (+); [37] Young et al. UK 2008 (+)

Evidence Statement 5: Care home resources and infrastructure for oral health care

44 studies described views on how **resources and infrastructure in the home** influenced oral health and care for residents[1-44]. 12 qualitative studies [5 (++)[16,20,22,29,42], 6 (+)[6,7,14,28,36,43], 1 (–)[17]], 27 cross-sectional surveys [5 (++)[2,21,30,39,40], 16 (+)[3,4,5,9,11,12,13,18,19,24,26,27,31,35,41,44], 6 (–)[10,15,23,32,37,38]], 1 (+) mixed methods[1], 1 (++) RCT with CSS data[8], 2 controlled before and after studies [1 (++)[33], 1 (+)[34]] and 1 (+) uncontrolled before and after study[25].

Of these studies 39 related care home resources and infrastructure to oral care **within the care home**[1,3-10,12,13,16-30,32-38,40-44] and 24 related this to **dental care treatment** access[2,6,13,15,17-24,26,27,29,31-34,36,37,39,42,43].

Resources and infrastructure considered to facilitate oral health and care included the presence of an **oral health care aide or champion**[16,34,36,42], **financial resources** to support the delivery of oral care[1,3,4,5,7,16,17,19,20,24,26,27,32,34,35-37], sufficient **equipment and facilities** within the care home[4,6-8,10,12,13,16,18-20,22-26,28-30,33,34,41], **staff time** for oral care[1,3-7,9,10,13,14,16,17,19-28,30,32-36,38,40,43,44] and transport to dental care services[1,4,5,7,11,16,18-20,22,26,29,37].

In general, the evidence is applicable to care homes in the UK since nine studies were conducted in the UK[1,10,11,15,18,22,31,39,44] and the remainder were in countries with similar settings. However, only one UK study[1] identified financial resources as a theme.

[1] Belsi et al. UK 2013 (+); [2] Brister et al. USA 2008 (++);[3] Chalmers et al. USA 1996 (+); [4] Chalmers et al. Australia 2001 (+); [5] Chung et al. Switzerland 2000 (+); [6] Dharamsi et al. Canada 2009 (+); [7] Finkleman et al. Canada 2013 (+); [8] Fjeld et al. Norway 2014 (++); [9] Forsell et al. Sweden 2010 (+); [10] Gately et al. UK 2011 (–); [11] Hally et al. UK 2003 (+); [12] Jablonski et al. USA 2009 (+); [13] Johnson and Lange USA 1999 (+); [14] Lindqvist et al. Sweden 2013 (+); [15] Longhurst UK 2002 (–); [16] MacEntee et al. Canada 1999 (++); [17] Maramaldi and Cadet USA 2014 (–); [18] Monaghan and Morgan UK 2010 (+); [19] Nunez et al. USA 2011 (+);[20] Paley et al. Australia 2009 (++); [21] Paulsson et al. Sweden 2003 (++); [22] Pratelli and Gelbier UK 1998 (++); [23] Pyle et al. USA 2005 (–); [24] Rabbo et al. Germany 2010 (+); [25] Reed et al. USA 2006 (+); [26] Schembri and Fiske Malta and Gozo 2005 (+); [27] Smith et al. USA 2010 (+); [28] Sonde et al. Sweden 2011 (+); [29] Tham and Hardy Australia 2013 (++); [30] Thole et al. USA 2010 (++); [31] Turner et al. UK 2009 (+); [32] Vergona USA 2005 (–); [33] Wårdh et al. Sweden 2000 (++); [34] Wårdh et al. Sweden 2002a (+); [35] Wårdh et al. Sweden 2012 (+); [36] Wårdh and Wikstrom Sweden 2014 (+); [37] Webb et al. USA 2013a (–); [38] Webb et al. USA 2013b (–); [39] White et al. UK 2009 (++); [40] Willumsen et al. Norway 2012 (++); [41] Wolden et al. Norway 2006 (+); [42] Yoon et al. Canada 2011a (++); [43] Yoon and Steele Canada 2012 (+); [44] Young et al. UK 2008 (+)

Evidence Statement 6: Involvement of the dental team with the care home

Twenty studies[1-20] discussed the **attitudes of the dental team** to caring for adults in residential care. Eight qualitative studies [4 (++)[9,13,15,17], 4 (+)[10,18-20]] and twelve cross-sectional surveys [2 (++)[2,6], 10 (+)[1,3-5,7,8,11,12,14,16]].

Ten studies report an apparent **unwillingness or lack of interest** from members of the dental health team in providing care in residential settings[1,3,4,6,7,11,13,16,17]. This is variously seen as inconvenient[1,12], unappealing[4,6,7,12] and/or time-consuming[4,7,9,11]. Conversely, a positive attitude to dental care in a residential setting was a facilitator of dental team involvement[6,12].

The need for a range of **additional education** relevant to care home populations was identified by members of the dental team in nine studies[1,3,4,6-8,12,17].

The involvement of dental practice staff as **member of the healthcare providing team** was seen as a facilitator of oral health in five studies [9,14,18-20], and its lack as a barrier in one study.[5]

The evidence is applicable to care homes in the UK since two studies were conducted in the UK[7,15] and the remainder were in countries with similar settings.

[1]Antoun et al. New Zealand 2008 (+); [2]Arpin et al. Canada 2008 (++); [3]Chalmers et al. Australia 2001 (+); [4]Chowdhry et al. Canada 2011 (+); [5]Chung et al. Switzerland 2000 (+); [6]Dickinson et al. USA 2012 (++); [7]Hally et al. UK 2003 (+); [8]Hopcraft et al. Australia 2008 (+); [9]MacEntee et al. Canada 1999 (++); [10]McKelvey et al. New Zealand 2003 (+); [11]Nitschke et al. Germany 2005 (+); [12]Nunez et al. USA 2011 (+); [13]Paley et al. Australia 2009 (++); [14]Pickard and Ablah USA 2005 (+); [15]Pratelli and Gelbier UK 1998 (++); [16]Smith et al. USA 2010 (+); [17]Tham and Hardy Australia 2013 (++); [18]Wårdh et al. Sweden 2003 (+); [19]Wårdh and Wikstrom Sweden 2014 (+); [20]Yoon and Steele Canada 2012 (+)

Evidence Statement 7: Dental service provision to care homes

33 studies described views on **dental service provision** to care homes[1-33]. 7 qualitative studies [4 (++)[16,19,21,27], 3 (+)[6,9,33])], 25 cross-sectional surveys [3 (++)[7,28,32], 15 (+)[1,3-5,8,12-14,17,18,20,23,25,26,30], 7 (–)[10,11,15,22,24,29,31]] and one (+) mixed methods study[2].

The **access to, availability and convenience** of dental services was considered to facilitate oral health and care (often expressed as their absence being a barrier to care) in the majority of studies[2,3,6,8,9-12,14-16,18,19,21,23-32].

Similarly, a specific barrier was identified by the dental team as **the ability to provide domiciliary care**; often a complex mixture of lack of time, funding & suitable equipment, and the specialist care and communication issues with the care population[1-3,7,11-27,29,31-33]. The **bureaucracy and paperwork** required to provide services was identified as a specific factor[2,4,16] as was the **lack of renumeration** or incentives for care provision[1-5,12,15,16,18-20,24-26].

The evidence is applicable to care homes in the UK since 8 studies were conducted in the UK[2,10,11,12,15,17,21,32] and the remainder were in countries with similar settings.

[1] Antoun et al. New Zealand 2008 (+); [2] Belsi et al. UK 2013 (+);[3] Chalmers et al. Australia 2001 (+); [4] Chowdhry et al. Canada 2011 (+); [5] Chung et al. Switzerland 2000 (+); [6]Dharamsi et al. Canada 2009 (+); [7] Dickinson et al. USA 2012 (++); [8] Dounis et al. USA 2012 (+); [9] Finkleman et al. Canada 2013 (+); [10] Frenkel UK 1999 (–); [11] Gately et al. UK 2011 (–); [12] Hally et al. UK 2003 (+); [13] Hopcraft et al. Australia 2008 (+); [14] Johnson and Lange USA 1999 (+); [15] Longhurst UK 2002 (–); [16] MacEntee et al. Canada 1999 (++); [17] Monaghan and Morgan UK 2010 (+); [18] Nunez et al. USA 2011 (+); [19] Paley et al. Australia 2009 (++); [20] Pickard and Ablah USA 2005 (+);[21] Pratelli and Gelbier UK 1998 (++); [22] Pyle et al. USA 2005 (–); [23] Rabbo et al. Germany 2010 (+) ; [24]Reznick and Matear Canada 2002 (–); [25]Schembri and Fiske Malta and Gozo 2005 (+); [26]Smith et al. USA 2010 (+); [27]Tham and Hardy Australia 2013 (++); [28] Vanobbergen and De Visschere Belgium 2005 (++); [29]Vergona USA 2005 (–); [30] Wårdh et al. Sweden 2002a (+); [31] Webb et al. USA 2013a (–); [32] White et al. UK 2009 (++); [33]Yoon and Steele Canada 2012 (+)

Evidence Statement 8: External resources to support care home residents' oral health

External factors for example support from relatives and friends were considered to improve oral health, care, and access to professional dental services in 8 studies[1-8]. 5 qualitative studies [4 (++) [2,5,6,8], 1 (+) [1]], 3 cross-sectional surveys [2 (+) [4, 7], 1 (–) [3]].

7 studies[2-8] related the influence of external factors to dental care treatment access and oral care.

Support from family members, friends or other residents was considered a facilitator of good oral health care in three studies[1,5,].

There were contrary views as regards to the importance of oral health care of residents in 3 studies[2,4,5].

The evidence is applicable to care homes in the UK since one study was conducted in the UK[7] and the remainder were in countries with similar settings.

[1]Finkleman et al. Canada 2013 (+), [2]MacEntee et al. Canada 1999 (++), [3]Matear and Barbaro Canada 2006 (–), [4]Nunez et al. USA 2011 (+), [5]Paley et al. Australia 2009 (++), [6]Tham and Hardy Australia 2013 (++), [7]Turner et al. UK 2009 (+), [8]Yoon et al. Canada 2011 (++)

Evidence Statement 9: Resident's behaviour, attitude and perception to their oral health

Forty studies described resident's negative behaviour, attitude and perception as a barrier to oral health care. 10 qualitative studies [4 (++)[17,21,22,28], 6 (+)[7,8,16,18,27,39]], 25 cross-sectional surveys [3 (++)[1,29,37], 18 (+)[3-6,10,12-15,19,20,23,25,26,30,34,38,40], 4 (–)[11,31,35,36]], two controlled before and after study [1 (++)[32], 1 (+)[33]], one (++)[9] randomised controlled trial, one (+)[2] mixed method and one (+)[24] uncontrolled before and after study.

Resident's behaviour was regarded as a barrier in all the studies. Examples of such behaviour includes not reporting pain or discomfort[1,17,19,25,28], use of adaptive techniques[8], resistive or challenging behaviour[1-40], a lack of check-up routines[21,28] and not asking for help with oral care or treatment[1,5,8,12,17,18,19,23,25,26,28,32,33,35-37].

Resident's negative attitude or perception was also identified as a barrier to oral health care in 20 studies[1,2,3,8,9,15-17,19-23,28,32-35,37,38].

The evidence is applicable to care homes in the UK since seven studies were conducted in the UK[2,11,12,22,26,30,40] and the remainder were in countries with similar settings.

[1]Arpin et al. Canada 2008 (++), [2]Belsi et al. UK 2013 (+), [3]Chalmers et al. USA 1996 (+), [4]Chalmers et al. Australia 2001 (+), [5]Chowdhry et al. Canada 2011 (+), [6]Chung et al.

Switzerland 2000 (+), [7]Dharamsi et al. Canada 2009 (+), [8]Finkleman et al. Canda 2013 (+), [9]Fjeld et al. Norway 2014 (++), [10]Forsell et al. Sweden 2010 (+), [11]Gately et al. UK 2011 (-), [12]Hally et al. UK 2003 (+), [13]Jablonski et al. USA 2009 (+), [14]Jobman et al. USA 2012 (+), [15]Johnson and Lange USA 1999 (+), [16]Lindqvist et al. Sweden 2013 (+), [17]MacEntee et al. Canada 1999 (++), [18]McKelvey et al. New Zealand 2003 (+), [19]Nitschke et al. Germany 2010 (+), [20]Nunez et al. USA 2011 (+), [21]Paley et al. Australia 2009 (++), [22]Pratelli and Gelbier UK 1998 (++), [23]Rabbo et al. Germany 2010 (+), [24]Reed et al. USA 2006 (+), [25]Schembri and Fiske Malta and Gozo 2005 (+), [26]Simons et al. UK 1999 (+), [27]Sonde et al. Sweden 2011 (+), [28]Tham and Hardy Australia 2013 (++), [29]Thole et al. USA 2010 (++), [30]Turner et al. UK 2009 (+), [31]Vergona USA 2005 (-), [32]Wårdh et al. Sweden 2000 (++), [33]Wårdh et al. Sweden 2002a (+), [34]Wårdh et al. Sweden 2012 (+), [35]Webb et al. USA 2013a (-), [36]Webb et al. USA 2013b (-), [37]Willumsen et al. Norway 2012 (++), [38]Wolden et al. Norway 2006 (+), [39]Yoon and Steele 2012 (+), [40]Young et al. UK 2008 (+)

Evidence Statement 10: Effect of resident's health and mobility on their oral health

Poor health and mobility amongst residents was a barrier to oral health care in 24 studies[1-24]. 10 cross-sectional surveys [1 (++)[18], 10 (+)[2,3,6-8,12,14,16,19,24], 3 (-)[5,21,22]], 8 qualitative [4(++)[10,13,15,18], 4 (+)[4,9,11,17]], 1 (+) mixed methods[1], and 1 (++) controlled before and after study[20].

9 studies[3,4, 11,13,16,17,18,19,21] described **poor general health** as a factor, which prevented residents from receiving good oral health care. In 17 studies[2,5,6,9,10,11,12,14,15,17,18,19,20,21,22,23,24], **cognitive decline** was considered a barrier to oral health due to difficulty in managing resident's behaviour. Other health conditions and hygiene were considered to be more important than oral health care in 8 studies[4-9,16,18]. 5 studies[1, 13,18,19,21], identified residents' mobility as a barrier to oral health care and accessing dental services.

The evidence is applicable to care homes in the UK since five studies were conducted in the UK[1,5,6,15,19] and the remainder were in countries with similar settings.

[1]Belsi et al. UK 2013 (+), [2]Chalmers et al. Australia 2001 (+), [3]Chowdhry et al. Canada 2011 (+), [4]Finkleman et al. Canada 2013 (+), [5]Gately et al. UK 2011 (-), [6]Hally et al. UK 2003 (+), [7]Hopcraft et al. Australia 2008 (+), [8]Johnson and Lange USA 1999 (+), [9]Lindqvist et al. Sweden 2013 (+), [10]MacEntee et al. Canada 1999 (++), [11]McKelvey et al. New Zealand 2003 (+), [12]Nunez et al. USA 2011 (+), [13]Paley et al. Australia 2009 (++), [14]Pickard et al. USA 2005 (+), [15]Pratelli and Gelbier UK 1998 (++), [16]Schembri and Fiske Malta and Gozo 2005 (+), [17]Sonde et al. Sweden 2011 (+), [18]Tham and Hardy Australia 2013 (++), [19]Turner et al. UK 2009 (+), [20]Wårdh et al. Sweden 2000 (++), [21]Webb et al. USA 2013 (-), [22]Webb et al. USA 2013b (-), [23]Willumsen et al. Norway 2012 (++), [24]Wolden et al. Norway 2006 (+)

Evidence Statement 11: Oral health care resources available to residents

The availability of **oral care resources for residents** was considered to influence oral health care in 10 studies[1-10]. 3 qualitative studies [2 (++)[9,6] and 1 (+)[4]], 5 cross-sectional surveys [1 (++)[1], 3(+)[3,5,8,] 1 (–)[10]], one (+) mixed-methods study[2], and one (+) uncontrolled before and after study[7].

Of these, 2 studies[6,9] described the previous and current **access to dental care** as a facilitator for good oral health care, and 8 studies[1-6,9,10]suggested that a corresponding lack of access acted as a barrier. 2 studies[6,9] described access to domiciliary dental care as a facilitator for good oral health care and four studies[5,6,9,10] identified a corresponding lack of access to domiciliary dental care as a barrier.

Resource-related barriers that were identified included **access to dental products** such as toothbrushes and paste[7,8]; the **financial costs** of care and treatment[1,3-6,10] and the **difficulties of travel** to access services[2,6,9].

The evidence is applicable to care homes in the UK since one study was conducted in the UK[2] and the remainder were in countries with similar settings. However, financial concerns were not identified in the UK study.

[1] Arpin et al. Canada 2008 (++); [2] Belsi et al. UK 2013 (+); [3] Chalmers et al. Australia 2001 (+); [4] Finkleman et al. Canada 2013 (+); [5] Nunez et al. USA 2011 (+); [6]Paley et al. Australia 2009 (++); [7]Reed et al. USA 2006 (+); [8]Schembri and Fiske Malta and Gozo 2005 (+); [9]Tham and Hardy Australia 2013 (++); [10]Webb et al. USA 2013a (–)

5. Discussion

The themes, from the quantitative and qualitative views research identified in this review, showed remarkable consistency across an estimated 17,000 voices from a wide range of population groups, settings, geographic and time periods.

The evidence identified also complemented the findings from the two earlier reviews carried out by this review group (on intervention effectiveness and best practice), notably in terms of the value of care home organisation and policies (including protocols and care plans, monitoring and the provision of appropriate oral care products), education and training of carers, and access to professional dental care.

Strengths and limitations of this review

This review was built on a comprehensive search strategy. The literature search included a thorough attempt to identify relevant published and unpublished studies.

Eleven UK-based studies were identified and the remaining 52 studies had direct applicability to UK settings.

The quality of studies overall was judged as moderate to high with 84% of studies deemed to be of high or moderate quality. The views of a wide range of relevant groups were largely consistent across populations settings and study designs.

Views presented in virtually all the included studies related to care of the elderly, with only two studies focusing on other adult populations. Both these studies related to the oral care of adults with learning difficulties.

There was very little evidence, with no clear findings, relating to variations by gender or other demographic factors.

Abbreviations

CBA	Controlled before and after (study)
CSS	Cross sectional survey
DH	Department of Health
F	Fluoride
GDP	General Dental Practitioner
GP	General Practitioner
MHRA	Medicines and Healthcare Regulatory Agency
MM	Mixed methods (study)
NHS	National Health Service
NICE	National Institute for Health and Care Excellence
RCT	Randomised controlled trial
QS	Qualitative Study
UBA	Uncontrolled before and after (study)

1 Introduction

1.1 Aim

To review the evidence about approaches, activities and interventions that promote oral health, prevent dental problems and ensure access to treatment for adults in care home settings.

1.2 Review question

What helps and hinders approaches to promote and protect oral health and access to dental check-ups and treatment in care homes?

1.3 Background and understanding

Care Home Residents - Demographics

The demographics of people living in care homes at any point in time are difficult to quantify precisely. According to Age UK (2014) calculations, in April 2012 there were 431,500 adults in residential care of whom approximately 414,000 (95%) were aged 65 or over. The 2011 Census reported there were 172,000 people aged 85 years or over living in care homes. Of these individuals, described by the Office for National Statistics (ONS) as the “oldest old”, 103,000 were living in a care home without nursing and 69,000 in a care home with nursing.

While the majority of care home residents are older people, there is a cohort of those aged 18-65, who are in residential care because their physical or mental health prohibits them living independently. From the Age UK data, it might be assumed that there were 17,500 such individuals in care, but Emerson et al. (2013) stated that the number of people with learning disabilities in residential care in England at 31 March 2012 was over 36,000 of whom just under 6000 were aged 65 or over. A previous report (Emerson et al. 2012) noted that that the proportion of residential care use by learning disabled adults aged 65 or over was increasing (from 11.3% in 2005/06 to 15.8% in 2011/12).

It is therefore apparent that the characteristics of those living in care homes are heterogeneous and their needs, wants and ability, both physical and cognitive, will vary significantly. Policies designed to encourage more independent living for people with learning disabilities in group and halfway houses, and to support older people to live in their own homes mean that numbers of people in residential care have decreased slightly. However, the evidence also suggests higher levels of care are being required by those in residential homes (ONS 2013; ONS 2014).

Care Home Residents – Demographic trends

Successive Adult Dental Health Surveys have shown that people are keeping their teeth for longer (Fuller et al. 2011). The ravages of dental decay in the early to mid-twentieth century, together with the then prevailing attitude to oral health meant that many people had all of their teeth extracted when young. However, as attitudes to dentistry changed, the availability of dental care increased, dental technology improved and most importantly fluoridated toothpaste became widely available, the proportion of adults in England who were edentate (no natural teeth) has fallen by 22 percentage points from 28 per cent in 1978 to 6 per cent in 2009 (Fuller et al. 2011).

The most recent figures from the Office for National Statistics (ONS 2014) indicate that the numbers of people aged 65 or over in the UK continues to rise and is currently 11.1 million or 17.4% of the UK population. The biggest percentage rise is in the population aged 85 or older and the 2011 census (ONS 2013), found 1.25 million people aged 85 or older; almost a 25% increase from the 2001 census. In 2009, some 72% of those "oldest old" still had some of their own teeth, the average number being 14 teeth (Fuller et al 2011).

Together these trends mean that in the coming years, not only will there be more older people, a proportion of whom will live in care, the vast majority will have some or indeed all of their own teeth. In part, that many have retained their own teeth is as a result of dental treatment and restorative care. Complex and expensive dental work including crowns, prostheses, implants and bridges are likely to become increasingly prevalent in care home residents. This poses a much greater preventive and dental care challenge than that associated with the older person who has lost all their own teeth and who may or may not be wearing a complete denture (British Dental Association, 2012).

Oral disease and care home residents

Dental caries and periodontal disease are to a large degree preventable. However, failure to maintain good oral hygiene, a diet rich in sugars and inadequate exposure to fluoride increase disease risk. Poor oral health can have a significant impact on the management of medical conditions, general health status, ability to eat and quality of life (Weening-Verbree et al. 2013). In addition, Azarpazhooh & Leake (2006) undertook a systematic review of associations between oral health and respiratory disease. The presence of oral pathogens, dental decay and poor oral hygiene were all identified as potential risk factors for pneumonia.

A Cochrane review (Brady et al. 2006) looked at the oral health of stroke patients in residential care and identified a lack of rigorous evidence on the topic, but stated that

oral healthcare interventions "can improve staff knowledge and attitudes, the cleanliness of patients' dentures and reduce the incidence of pneumonia."

In a systematic review Miegel & Wachtel (2009) identified a number of barriers to good oral health in care homes. These included lack of oral health education of care providers (including staff training); care provider attitudes to the oral health of residents; oral health policy and documentation; lack of oral health resources in terms of equipment and staff time and a failure to undertake oral health assessments. Wårdh et al. (2012) identified dislike or fear of providing oral care particularly when combined with lack of adequate training or time to complete the task to be an issue for caregivers. These problems are exacerbated where the older person has dementia, communication or behaviour difficulties, or resists care (Jablonski et al. 2011).

Cognitive and physical disabilities may preclude effective mouth care and this is especially so in those in residential care who may be totally dependent on carers to assist with or clean their teeth and/or dentures. As a result the incidence of oral diseases in care home residents tends to increase (Naorungroj 2013). This may happen prior to individuals entering residential care and may be exacerbated by medications that cause dry mouths (SA Dental Service 2009).

The National Institute for Health and Care Excellence (NICE) has been asked by the Department of Health to develop a public health guideline for carers working in health and social residential care settings (including nursing homes and residential care homes) on effective approaches to promoting oral health, preventing dental health problems and ensuring access to dental treatment when needed.. This review is the third of three reviews developed by this team to inform the guidance. It considers barriers and facilitators. Review 1 examined the effectiveness of interventions and Review 2 considered best practice, as defined by local, national and international guidance documents.

2 Methods

The review was conducted using methods outlined in the NICE Manual: *Methods for the development of NICE public health guidance.*[3]

2.1 Literature search

A wide range of databases and websites were searched systematically; supplemented by grey literature[4] searches. Searches were carried out to identify research as to what helps and hinders approaches to promote and protect oral health, and access to dental check-ups and treatment in care homes .

The following types of evidence were sought for inclusion: quantitative and qualitative research that reported the views and perspectives of service users and providers, in the English language and published between January 1995 and September 2014.

For the search, a strategy was developed in Ovid Medline (see Appendix 1) and was adapted to all other databases listed below.

Databases

AMED (Allied and Complementary Medicine) - Ovid
ASSIA (Applied Social Science Index and Abstracts) - Proquest
CINAHL (Cumulative Index of Nursing and Allied Health Literature) - EBSCO
Embase - Ovid
Health Management Information Consortium (HMIC) - Ovid
MEDLINE and MEDLINE in Process - Ovid
OpenGrey http://www.opengrey.eu/
Social Care Online http://www.scie-socialcareonline.org.uk/

Websites

Australian Research Centre for Population Oral Health
http://www.adelaide.edu.au/arcpoh/
British Society of Gerodontology
British Society for Disability and Oral Health
Clinical trial registers:

- WHO ITCRP http://www.who.int/ictrp/en/
- Clinicaltrials.gov http://www.clinicaltrials.gov/

Electronic Theses Online Service (EThOS) http://ethos.bl.uk
European Association of Dental Public Health http://www.eadph.org/

[3] http://publications.nice.org.uk/methods-for-the-development-of-nice-public-health-guidance-third-edition-pmg4
[4] Technical or research reports, doctoral dissertations, conference papers and official publications.

Health Evidence Canada http://www.healthevidence.org/
International Association of Dental Research (IADR)
National Oral Health Conference
http://www.nationaloralhealthconference.com/
NICE Evidence Search https://www.evidence.nhs.uk/
Public Health England https://www.gov.uk/government/organisations/public-health-england
Public Health Wales http://www.wales.nhs.uk/sitesplus/888/home
Scottish Public Health network http://www.scotphn.net/
Social Care Institute for Excellence (SCIE) http://www.scie.org.uk/
US National Guideline Clearing House http://www.guideline.gov/
Australian Clinical Practice Guidelines Portal http://www.clinicalguidelines.gov.au/
New Zealand Guidelines Group http://www.health.govt.nz/about-ministry/ministry-health-websites/new-zealand-guidelines-group
Public Health Agency of Canada http://www.phac-aspc.gc.ca/dpg-eng.php

In addition a variety of supplementary methods were employed to identify additional research:

- For included documents, reference lists were checked and citation tracking was undertaken in Web of Science and Scopus databases.
- The electronic table of contents of three key journals were searched: *Special Care in Dentistry*, *The Journal of Disability and Oral Health* and *Gerodontology*.
- Experts in the field and authors of included papers were contacted to identify additional research and 'sibling' studies.
- A call for evidence was issued by NICE.

Results of all searches were combined in a Reference Manager 12 database.

2.2 Inclusion and exclusion criteria

The following inclusion criteria were used

Inclusion	**Population** Adults in care homes with or without nursing provision, including people staying for rehabilitation or respite care. The term 'care homes' covers homes that provide 24 hour residential care. This may include adults living in community hospitals that provide long term-care.

	Activities: • Conducting assessments of individual oral health, for example on entry to a care home and in response to changing oral health needs. • Maintaining access to dental services, including those offered by local salaried dental services, general dental practice and coordinating other health care services. For example joining up oral health services with other health initiatives provided in care home settings (such as services offered by GPs, vision testing, social services, podiatry). • Staff training about oral health (including understanding the effect of oral health on general health and wellbeing). • Increasing access to fluoride for people living in care homes. For example, by providing free fluoride toothpaste or gels, providing fluoride supplements, or by dental health care professionals offering fluoride varnish applications in care homes. • Providing oral health education and information about promoting and maintaining oral health (for example the role of diet, techniques for brushing teeth and maintaining healthy dentures). • Providing resources to improve oral hygiene for people living in care homes (as appropriate), for example providing a range of toothbrushes including electric toothbrushes. • Managing transitions if oral function deteriorates or a person's usual diet has to change. • Considering the effect of diet, alcohol and tobacco on the oral health of people living in care homes. **Outcomes:** • Changes in: . The oral health of people living in care homes. For example, by identifying earlier the incidence and prevalence of tooth decay, periodontal disease, oral discomfort including pain and oral cancer. Also, for example, leading to a change in nutritional status among people living in care homes. . Modifiable risk factors, including the use of fluoride toothpaste, fluoride supplements, fluoride varnishes, frequency and quality of oral hygiene practices, and access to or visits from dental services. . Policies or procedures in care homes. . Knowledge and attitudes of care home managers and staff, and other health and social care professionals. . Resident's quality of life, including social and emotional wellbeing. . People's knowledge and ability to improve and protect their

	oral health. . People's oral health behaviours. • Adverse events or unintended consequences •
Exclusion	• Adults living independently in the community. • Adults in hospitals providing secondary or tertiary care for example acute hospitals or specialised units. • Adults in prison. • Children and young people under 18 years. • Water fluoridation. • Specialised oral health interventions, including dental clinical procedures, treatments or medicines. • Concentration of fluoride in fluoride products such as toothpastes and supplements. • Specific techniques or instruction for carers to help people with their oral hygiene (for example, techniques to remove dentures, clean the mouth, brush teeth, or perform a range of oral hygiene tasks). • Interventions with an indirect oral health outcome only (eg bacterial count or pneumonia incidence).

Given the large number of studies identified, it was agreed with NICE that included papers would be restricted to those conducted in the UK, Western Europe, North America and Australia/New Zealand. This ensured high levels of applicability.

2.3 Study selection

After de-duplication and removal of clearly irrelevant citations (e.g. papers not related to oral health, animal studies), selection at both title/abstract and full text stages was undertaken independently by two reviewers using the inclusion and exclusion criteria. Any disagreements at either stage were resolved by recourse to a third reviewer. Papers excluded at full text are reported in Appendix K with the reason for exclusion.

2.4 Quality assessment

Critical appraisal was carried out using appropriate checklist from the methods for the development of NICE public health guidance (NICE 2012).

Quantitative cross-sectional studies were assessed using a modified version of the Correlation Studies checklist (NICE 2012). The modified checklist contains an additional question relating to piloting of survey items and highlights questions that are only applicable to either correlation studies or cross-sectional surveys. Other checklists were used without modification.

Studies were assessed by one reviewer and checked by a second, and disagreements resolved by discussion. Ten percent of the studies were double assessed. Each study was rated ('++', '+' or '–') to indicate its quality. Appendices B-D provide a summary of the validity ratings for each element of the included studies.

++	All or most of the checklist criteria have been fulfilled, and where they have not been fulfilled the conclusions are very unlikely to alter.
+	Some of the checklist criteria have been fulfilled, and where they have not been fulfilled, or are not adequately described, the conclusions are unlikely to alter.
–	Few or no checklist criteria have been fulfilled and the conclusions are likely or very likely to alter.

2.5 Data extraction – characteristics and methodology

Evidence was extracted directly into the Evidence Table format agreed with NICE (Appendix A). Each data extraction form was completed by one reviewer and checked for accuracy by another. Ten percent of the documents were extracted independently by two reviewers.

Where possible, data were selected and characterised using PROGRESS-Plus to identify disadvantaged populations (Oliver et al. 2008). PROGRESS is an acronym for: Place of Residence, Race/Ethnicity, Occupation, Gender, Religion, Education, Socioeconomic Status, and Social Capital. Plus represents additional categories such as Age, Disability, and Sexual Orientation.

2.6 Data Synthesis

A synthesis of views regarding barriers and facilitators was guided by the NICE manual (NICE 2012, Section 5.4) and Dixon Woods (2004).

A broad synthesis of the included evidence was performed. Analysis was conducted in stages (method), and themes were generated from data. Qualitative nVivo software was used to highlight and retrieve coded text in order to assist analysis. Views and opinions gathered from cross-sectional questionnaires and mixed methods studies were analysed thematically and integrated with the key findings from qualitative studies.

Findings are summarised in concise narrative summaries and evidence statements, supported by the Evidence Table (Appendix A). The statements indicate the message given by the evidence and the applicability of the results to the UK.

Conceptual framework

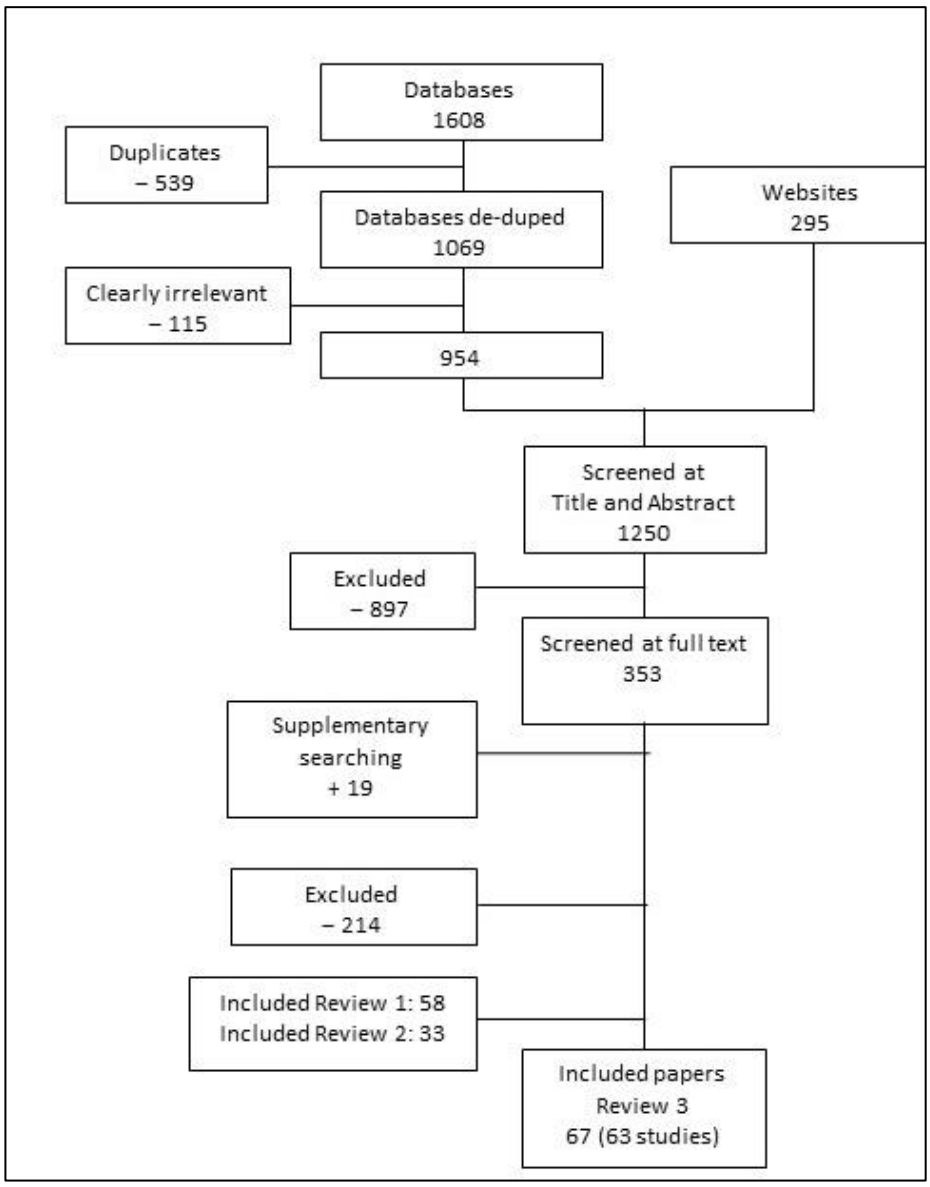
A conceptual framework was developed and refined based on the results of the review. The framework identifies and maps key factors that act as barriers/facilitators to the provision of oral care. These are mapped for specific groupings: residents, carers, care homes and dental teams. See Figure 1 on page 56.

3 Results

3.1 Search results

The search strategy identified 1,608 citations from database searching of which 654 were excluded as duplicates or clearly irrelevant (e.g. animal studies or no mention of oral health). 1,250 citations (954 from the database searches and 295 from web site searching) were reviewed in title and abstract and 353 in full text. Full details are provided in the flow diagram below.

Sixty three studies (reported in 67 papers) were included. These provided data that met the inclusion criteria for this review.



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3.2 Applicability and quality of studies

Studies are summarised in Table 1 (Page 50) and Appendix A (Page 66)

Eleven studies were based in the UK and the remainder were in countries with applicable care settings: 19 in the USA, nine in Canada, eight in Sweden, 4 in Australia, 3 each in Germany and Norway, two in New Zealand and one each in Belgium, Malta/Gozo, Spain and Switzerland. Applicable countries were identified by oral health experts in the review group and agreed with NICE.

Study designs comprised 45 cross sectional surveys, 15 qualitative studies (one of which employed mixed methods), and three intervention studies (one randomised controlled trial, one controlled before and after study and one uncontrolled before and after study) incorporating findings on participant views.

In general, study quality was was moderate to high with 16 studies deemed to have high quality (++), 37 studies of moderate quality (+) and 10 studies of low quality (−).

The majority of studies related to oral care for the elderly with only two studies focusing on other adult populations. Both studies related to the oral care of adults with learning difficulties.

4 Findings

From analysis of the included studies, 11 major themes emerged with consistency across population groups, different care homes, dates and geographical settings.

These themes, which are detailed in Evidence Statements (ES) 1-11 below were broadly grouped into views on the importance of:

- Care home staff skills, knowledge and attitudes (ES 1-3)
- Care home organisation, policy and resources (ES 4-5)
- Professional dental team involvement, resources and attitudes (ES 6-7)
- Support from family, friends and other residents (ES 8)
- Residents' behaviour, health, attitudes and access to resources (ES 9-11)

A brief summary of the individual studies is provided in Table 1 (p. 50) with more detailed information in Appendix A (p. 66).

Care home staff knowledge and skills: Oral health care

A recognition of the need for oral health knowledge and skills in care home staff was a major theme, and identified in 33 studies (see Evidence Statement 1).

Thirty two of the studies were in elderly care homes while one, a (++) cross sectional survey (Thole et al. 2010), was in a care home in the USA for adults with disabilities.

This view, describing knowledge as a facilitator of good oral care or its absence as a barrier, was reported across a wide range of settings and groups including single-voice studies of carers (Dharamsi et al. 2009, Forsell et al. 2010, Gately et al. 2011, Jablonski et al. 2009, Jobman et al. 2012, Thole et al. 2010, Vanobbergen and De Visschere 2005, Wårdh et al. 2012, Young et al. 2008), nurses and physicians (Paulsson et al. 2003, Wårdh et al. 2000, Yoon et al. 2011a), care home managers (Maramaldi and Cadet 2014, Pyle et al. 2005, Rabbo et al. 2010, Schembri and Fiske 2005) and residents (Finkleman et al. 2013, Reed et al. 2006).

> *'We're hesitant to go ahead with cleaning [residents'] tongue or brushing teeth for those [residents] who have loose teeth or a bad gag [reflex]. If the resident's gum bleeds, we don't know what to do.'* Carer [Dharamsi *Canada* 2009]

Nine of the studies specifically identified the importance of knowledge in care home staff in supporting the access to dental care by residents (Chalmers et al. 2001, Gately et al. 2011, Johnson and Lange 1999, Maramaldi and Cadet 2014, Nunez et al. 2011, Paley et al. 2009, Schembri and Fiske 2005, Turner et al. 2009, Webb et al. 2013a)

'Dentists also perceived more than DONs [Directors of Nursing]. that families and residents were not interested in dental care, that nursing home staff had a lack of knowledge about dental care, that nursing home staff and time constraints were problematic, and that residents' medical problems and obtaining consent for treatment were problematic.' [Nunez *USA* 2011]

Evidence Statement 1: Care home staff knowledge and skills in oral health care

Knowledge and/or skills to provide oral hygiene care amongst care home staff was considered to influence oral health care of residents in 33 studies[1-33]. 10 qualitative studies [4 (++)[11,15,22,32], 5 (+)[3,4,10,13,21]), 1 (-)[12]], 20 cross-sectional surveys [4 (++)[16,23,25,31], 12 (+)[1,2,5,7-9,14,18,20,24,28,33], 4 (–)[6,17,29,30]], two controlled before and after [1 (++)[26], 1 (+)[27]]and one (+) uncontrolled before and after study[19].

Of these, 16 studies[3,7,9-12,15-25,33] described the presence or improvement of knowledge and skills as a facilitator for care and 31[2-31,33] described its absence as a barrier to care. Knowledge and skills that were considered helpful were care techniques and strategies for providing care when faced with difficult and resistant behaviours.

A lack of knowledge and skills amongst care home staff was described as a barrier to care home residents **accessing professional dental care** in nine studies[1,6,9,12,14,15,20,24,29]. Sufficient or improved dental or oral health knowledge and skills was considered to enable dental care access in six studies[2,10,13,16,20,24]. Oral health knowledge and skills relevant to dental care access included the identification of oral health conditions and how to access dental services.

The evidence is applicable to care homes in the UK since three studies were conducted in the UK[6,24,33] and the remainder were in countries with similar settings.

[1] Chalmers et al. Australia 2001 (+); [2] Chung et al. Switzerland 2000;[3] Dharamsi et al. Canada 2009 (+); [4] Finkleman et al. Canada 2013 (+); [5] Forsell et al. Sweden 2010 (+); [6] Gately et al. UK 2011 (–); [7] Jablonski et al. USA 2009 (+); [8] Jobman et al. USA 2012 (+); [9] Johnson and Lange USA 1999 (+); [10] Lindqvist et al. Sweden 2013 (+); [11] MacEntee et al. Canada 1999 (++); [12] Maramaldi and Cadet, USA 2014 (–); [13] McKelvey et al. New Zealand 2003 (+); [14] Nunez et al. USA 2011 (+); [15] Paley et al. Australia 2009 (++); [16] Paulsson et al. Sweden 2003 (++); [17] Pyle et al. USA 2005 (–); [18] Rabbo et al. Germany 2010 (+); [19] Reed et al. Canada 2006 (+); [20] Schembri and Fiske Malta & Gozo 2005 (+); [21] Sonde et al. Sweden 2011 (+); [22] Tham and Hardy Australia 2013 (++); [23] Thole et al. USA 2010 (++); [24] Turner et al. UK 2009 (+); [25] Vanobbergen and De Visschere Belgium 2005 (++); [26] Wårdh et al. Sweden 2000 (++); [27] Wårdh et al. Sweden 2002a (+); [28] Wårdh et al. Sweden 2012 (+); [29] Webb et al. USA 2013a (–); [30] Webb et al. USA 2013b

(–) ; [31] Willumsen et al.Norway 2012 (++); [32] Yoon et al. Canada 2011a (++); [33] Young et al. UK 2008 (+)

Attitudes amongst care home staff : oral health care

The importance of the attitudes of care home staff in influencing oral care and health of residents was a major theme, identified in 46 studies (see Evidence Statement 2).

All but one of the studies were in elderly residential care. The other study, a (++) cross sectional survey (Thole et al. 2010), was in a home in the USA for adults with disabilities.

This view, describing positive attitude as a facilitator of good oral care or its absence as a barrier, was reported across a wide range of settings and groups including single-voice studies of carers (Chalmers et al. 1996, Cornejo-Ovalle et al. 2013, Dharamsi et al. 2009, Fjeld et al. 2014, Forsell et al. 2010, Frenkel 1999, Gately et al. 2011, Jablonski et al. 2009, Jobman et al. 2012, Pyle et al. 1999, Reed et al. 2006, Reznick and Matear 2002, Thole et al. 2010, Vanobbergen and De Visschere 2005, Wårdh et al. 2012, Wolden et al. 2006, Young et al. 2008), nurses (Paulsson et al. 2003, Wårdh et al. 2000), care home managers (Belsi et al. 2013, Johnson and Lange 1999, Maramaldi and Cadet 2014, Pratelli and Gelbier 1998, Pyle et al. 2005, Rabbo et al. 2010, Smith et al. 2010, Vergona 2005) and residents (Finkleman et al. 2013, Reed et al. 2006, Simons et al. 1999).

> *'…the care providers expressed specific barriers to providing consistent and thorough oral hygiene/ care to their residents. The most frequently expressed barriers were: 'fear that a patient may bite me', 'the patients refuse to open their mouths' and 'patients' bad breath'.* Carer [Reed *USA* 2006]

> *'Findings indicate that while long-term administrators are committed to excellent oral care for their residents, competing demands for resources combined with a lack of incentives make oral health a low priority issue.'* [Maramaldi *USA* 2014]

Seventeen of the studies specifically identified the importance of dental team attitudes in supporting the access to dental care by residents (Belsi et al. 2013, Chalmers et al. 2001, Chung et al. 2000, Gately et al. 2011, Hally et al. 2003, Johnson and Lange 1999, MacEntee et al. 1999, Maramaldi and Cadet 2014, Matear and Barbaro 2006, Nitschke et al. 2010, Nunez et al. 2011, Paley et al. 2009, Pratelli and Gelbier 1998, Rabbo et al. 2010, Reznick and Matear 2002, Turner et al. 2009, Yoon and Steele 2012).

> *'Both dentists and DONs had similar views concerning the following described problems: dentists' disinterest in nursing home dentistry, financial constraints of residents,*

residents' cognitive status and behavior problems, dentists' preference to treat residents at their dental office, transportation to dental office, insufficient training for dentists, and low financial reimbursement for dentists.' [Nunez *USA* 2011]

Evidence Statement 2: Attitudes of care home staff to oral health

Forty six studies contained views on the attitudes of care home staff and their influence on oral health care for residents[1-45]. 13 qualitative studies [4 (++)[17,23,25,34], 8 (+)[6,7,16,20,33,20,42,45], 1 (-)[18]], 29 cross-sectional surveys [5 (++)[24,26,35,37,43], 18 (+)[2,3,4,5,9,12-15,21,22,28,31,32,36,41,44,46], 6 (–)[10,11,19,27,30,38]], one survey within a (++) RCT[8], one (+) mixed methods[1], one (++) controlled before and after study[39] and one (+) uncontrolled before and after study[29].

Negative attitudes amongst care home staff, were described as barriers to the provision of oral care for residents in 36 studies[2,4,6-11,13-16,18,20,22-27,29,32-46]. Negative attitudes included a dislike of oral care provision to residents, a sense of violation of the resident, difficulty and a lack of priority or willingness to undertake oral health care.

Positive attitudes or the absence of negative attitudes were described in 21 studies as being facilitators of oral care[2,5,6,10,13,15,16,18,23-25,27,29,31-34,36,37,45,46].

Attitudes in relation to **dental care access** were a theme in 17 studies[1,3,4,11,12,15,17-19,21-23,25,28,30,36,45]. Negative attitudes were identified as a barrier to dental care access in all 17 studies[1,3,4,11,12,15,17-19,21-23,25,28,30,36,45]. These included a low sense of priority towards dental treatment and difficulties in finding and getting residents to dental care. Positive attitudes or a lack of negative attitudes associated with dental care access were identified in 12 of these studies.[1,3,12,15,18,21,23,25,28,30,36,45]. Facilitators included finding it easy to access dental care, and a sense of importance of dental care.

The evidence is applicable to care homes in the UK since eight studies were conducted in the UK[1,10-12,25,31,36,46] and the remainder were in countries with similar settings.

[1] Belsi et al. UK 2013 (+); [2] Chalmers et al. USA 1996 (+);[3] Chalmers et al. Australia 2001 (+); [4] Chung et al. Switzerland 2000 (+); [5] Cornejo-Ovalle et al. Spain 2013 (+); [6] Dharamsi et al. Canada 2009 (+); [7] Finkleman et al. Canada 2013 (+); [8] Fjeld et al. Norway 2014 (++); [9] Forsell et al. Sweden 2010 (+); [10] Frenkel UK 1999 (–); [11] Gately et al. UK 2011 (–); [12] Hally et al. UK 2003 (+); [13] Jablonski et al. USA 2009 (+); [14] Jobman et al. USA 2012 (+); [15] Johnson and Lange USA 1999 (+); [16] Lindqvist et al. Sweden 2013 (+); [17] MacEntee et al. Canada 1999 (++); [18] Maramaldi and Cadet USA 2014 (–); [19] Matear and Barbaro Canada 2006 (–); [20] McKelvey et al. New Zealand 2003 (+); [21] Nitschke et al. Germany 2010 (+); [22] Nunez et al. USA 2011 (+); [23] Paley et al. Australia 2009 (++); [24] Paulsson et al. Sweden 2003 (++); [25] Pratelli and Gelbier UK 1998 (++); [26] Pyle et al. USA 1999 (++); [27] Pyle et al. USA 2005(–); [28]

Rabbo et al. Germany 2010 (+); [29] Reed et al. USA 2006 (+); [30] Reznick and Matear Canada 2002 (–); [31] Simons et al. UK 1999 (+); [32] Smith et al. USA 2010 (+); [33] Sonde et al. Sweden 2011 (+); [34] Tham and Hardy Australia 2013 (++); [35] Thole et al. USA 2010 (++); [36] Turner et al. UK 2009 (+); [37] Vanobbergen and De Visschere Belgium 2005 (++); [38] Vergona USA 2005 (–); [39] Wårdh et al. Sweden 2000 (++); [40] ; Wårdh et al. Sweden 2002a (+) [41] Wårdh et al. Sweden 2012 (+); [42] Wårdh and Wikstrom Sweden 2014 (+); [43] Willumsen et al. Norway 2012 (++); [44] Wolden et al. Norway 2006 (+); [45] Yoon and Steele Canada 2012 (+); [46] Young et al. UK 2008 (+)

Oral care education and training for care home staff

The importance of oral health care training for care home staff was a theme in 18 studies (see Evidence Statement 3).

Support for education and training came from a range of interviewees, including mixed groups and the single voice studies of carers (Cornejo-Ovalle et al. 2013, Dharamsi et al. 2009, Frenkel 1999, Gately et al. 2011, Jobman et al. 2012, Wårdh et al. 2012, Webb et al. 2013b), care home managers (Pyle et al. 2005, Smith et al. 2010, Vergona 2005, Webb et al. 2013a, White et al. 2009) and residents (Reed et al. 2006).

> *'Training on this subject is of utmost importance in this institution as oral and denture care is almost non-existent.'* Carer [Gately et al. *UK* 2011]

Evidence Statement 3: Oral health education and training for care home staff

Eighteen studies described **training in oral health as relevant to oral health care**[1-18]. Four qualitative studies [2 (++)[8,12], 2 (+)[2,7])], 13 cross-sectional surveys [2 (++)[17,18], 5 (+)[1,2,6,11,14], 6 (–)[4,5,9,13,15,16]] and one (+) uncontrolled before and after study[10].

Inadequate, absent or a lack of **regular oral health care education** was described as a barrier to good oral care in 15 studies[1-8,11-18]. Oral health and care training was regarded as a facilitator in six studies[2,3,5,9,10,12]. Both theoretical and hands-on practical education was advocated. Training to overcome the specific barrier of **resistant behaviour** was highlighted in six studies[3,6,12,13,15,18].

A lack of oral care training for care home staff was also considered a barrier for **dental care service access** for residents in six studies[5,8,11,12,16,17] because staff were unable to recognise the importance of oral care, and therefore do anything about it.

The evidence is applicable to care homes in the UK since three studies were conducted in

the UK[4,5,17] and the remainder were in countries with similar settings.

[1]Chung et al. Switzerland 2000 (+); [2] Cornejo-Ovalle et al. Spain 2013 (+);[3] Dharamsi et al. Canada 2009 (+); [4]Frenkel UK 1999 (–); [5] Gately et al. UK 2011 (–); [6] Jobman et al. USA 2012 (+); [7] Lindqvist et al. Sweden 2013 (+); [8] Paley et al. Australia 2009 (++); [9] Pyle et al. USA 2005 (–); [10] Reed et al. USA 2006 (+); [11] Smith et al. USA 2010 (+); [12] Tham and Hardy Australia 2013 (++); [13] Vergona USA 2005 (–); [14] Wårdh et al. Sweden 2012 (+); [15] Webb et al. USA 2013a (–); [16]Webb et al. USA 2013b (–); [17] White et al. UK 2009 (++); [18]Willumsen et al. Norway 2009 (++)

Home organisation and policy: Oral health care

37 studies described views on how care home organisation and policies affect oral health and dental care (see Evidence Statement 4).

All the studies took place in elderly residential care settings.

The importance of care home organisational factors was shared across groups and included single voice studies of carers and nurses (Chalmers et al. 1996, Dharamsi et al. 2009, Frenkel 1999, Jablonski et al. 2009, Paulsson et al. 2003, Vanobbergen and De Visschere 2005, Wårdh et al. 2000, Wårdh et al. 2012, Webb et al. 2013b, Yoon et al. 2011a, Young et al. 2008), managers (Maramaldi and Cadet 2014, Monaghan and Morgan 2010, Pratelli and Gelbier 1998, Pyle et al. 2005, Rabbo et al. 2010, Schembri and Fiske 2005, Smith et al. 2010, Vergona 2005, White et al. 2009) and residents (Finkleman et al. 2013, Reed et al. 2006).

Care routines that included oral care and organisational policies that ensured regular oral care and dental checks were associated with improved oral care.

> *To date I can count on one hand the number of times a dentist has come to the home' and '. . . Why should prevention is better than cure only apply to the young?' Carer* [Frenkel *UK* 1999]

> *'When asked about the issues that dentists deal with when providing care to residents, the following themes arose. Challenges in providing outreach oral health services. Dentists reported that it was very difficult to provide oral health treatment within aged care services as the premises lack appropriate infrastructure. 'These aged care facilities should have a multi-purpose room for providing treatment. Need to be able to define what we need…in terms of size, space, amenities, power outlets. Need to sit and talk to the physios and everyone else who uses such spaces, especially those who do their hair'.* [Tham *Australia* 2013]

Having good communication and clear accountability to ensure that policies were followed was associated with improved care and the absence of this was a barrier to care.

> *'...only 22 (37%) labelled their residents dentures.'* [Hally *UK* 2003]

> *'The care providers expressed specific barriers to providing consistent and thorough oral hygiene/ care to their residents. The most frequently expressed barriers were: 'fear that a patient may bite me', 'the patients refuse to open their mouths' and 'patients' bad breath'. Also mentioned was the fact that oral health care was not specifically included in their job responsibilities and that there was insufficient time to brush teeth after every meal/or daily. Thus, both structural and attitudinal barriers to the provision of oral hygiene were reported.* [Reed *USA* 2006]

Evidence Statement 4: Care home organisation and policies for oral health care

37 studies described views on how **care home organisation and policies** affect oral health and dental care[1-37]. 13 qualitative studies [5 (++)[10,15,17,24,35], 7 (+)[3,4,8,12,23,31,36], 1 (–)[11]], 21 cross-sectional surveys [4 (++)[16,26,33,34], 12 (+)[1,2,6,7,13,14,19,21,22,25,30,37], 5 (–)[5,9,18,27,32]], two controlled before and after studies [1 (++)[28], 1 (+)[29]] and one (+) uncontrolled before and after study[20].

Organisation and policies included **care home routines and organisational policies** (36 studies)[1-29,31-37] and **communication and accountability** (22 studies) [2,3,6,8,10,19-31,33,34,36,37].

32 studies related these factors to oral care[1-12,15-20,22,23,25-37] and 24 related them to dental treatment care access[2,4-6,9,10,12-15,17-19,21-25,27-29,31-33].

Care home routines that included oral care and organisational policies that ensured regular oral care and dental checks were associated with improved oral care. Having good communication and clear accountability to ensure that policies were followed was associated with improved care and the absence of this was a barrier to care.

The evidence is applicable to care homes in the UK since 8 studies were conducted in the UK[5,6,9,13,17,25,33,37] and the remainder were in countries with similar settings.

[1] Chalmers et al. USA 1996 (+); [2] Chung et al. Switzerland 2000 (+);[3] Dharamsi et al. Canada 2009 (+); [4] Finkleman et al. Canada 2013 (+); [5] Frenkel UK 1999 (–); [6] Hally et al. UK 2003 (+); [7] Jablonski et al. USA 2009 (+); [8] Lindqvist et al. Sweden 2013 (+); [9] Longhurst UK 2002 (–); [10] MacEntee et al. Canada 1999 (++); [11] Maramaldi and Cadet USA 2014 (–); [12] McKelvey et al. New Zealand 2003 (+); [13] Monaghan & Morgan UK 2010 (+); [14] Nitschke et al. Germany 2010

(+); [15] Paley et al. Austarlia 2009 (++); [16] Paulsson et al. Sweden 2003 (++); [17] Pratelli and Gelbier UK 1998 (++); [18] Pyle et al. USA 2005 (–); [19] Rabbo et al. Germany 2010 (+); [20] Reed et al. USA 2006 (+); [21] Schembri and Fiske Malta and Gozo 2005 (+); [22] Smith et al. USA 2010 (+); [23] Sonde et al. Sweden 2011 (+); [24] Tham and Hardy Australia 2013 (++); [25] Turner et al. UK 2009 (+); [26] Vanobbergen and De Visschere Belgium 2005 (++); [27] Vergona USA 2005 (–); [28] Wårdh et al. Sweden 2000 (++); [29] Wårdh et al. Sweden 2002a (+); [30] Wårdh et al. Sweden 2012 (+); [31] Wårdh and Wikstrom Sweden 2014 (+);[32] Webb et al. USA 2013b (–); [33] White et al. UK 2009 (++); [34] Willumsen et al. Norway 2012 (++); [35] Yoon et al. Canada 2011a (++); [36] Yoon and Steele Canada 2012 (+); [37] Young et al. UK 2008 (+)

Care home resources and infrastructure: oral health care

The importance of care home and resources infrastructure was a major theme, identified in 44 studies (see Evidence Statement 5).

Thirty two of the studies were in elderly residential care while two, both (++) cross sectional survey (Brister et al. 2008, Thole et al. 2010), were in homes in the USA for adults with disabilities.

This theme was identified in 70% of all studies included in this review (44/63 studies) and across a very wide range of settings and groups, including carers, nurses, physicians, the dental team, care home managers, residents and their families.

Resources and infrastructure considered to support oral health and care included:

- the presence of an oral health care aide or champion
- sufficient equipment and facilities within the care home to support care, and
- transport to dental care services
- staff time for care

> *'A second important factor explaining some of the more effective oral health programs seemed to be the presence of a ''champion'' for oral health. Such a champion might be an insider, such as a staff member or administrator with a particular enthusiasm for oral health care, or an especially influential outsider, such as a local dentist or community oral hygienist.'* [Thorne 2001, Secondary analysis of MacEntee *Canada* 1999]

> *'Sixty-one per cent of the homes (20) did not provide toothbrushes, toothpastes or denture adhesives for the residents.'* [Schembri *Malta and Gozo* 2005]

'Despite the nursing staff accepting daily oral care provision as part of their responsibilities, workload constraints were described as a barrier that often relegated oral care to being a low priority: ''We know [oral care] is really important, but cleaning a diaper takes a little bit more priority than mouth care''' [Yoon *Canada* 2012]

The lack of financial resources to support health care was identified in 17 studies (Belsi et al. 2013, Chalmers et al. 1996, Chalmers et al. 2001, Chung et al. 2000, Finkleman et al. 2013, MacEntee et al. 1999, Maramaldi and Cadet 2014, Nunez et al. 2011, Paley et al. 2009, Rabbo et al. 2010 (+), Schembri and Fiske 2005, Smith et al. 2010, Vergona 2005, Wårdh et al. 2002, Wårdh et al. 2012, Wårdh and Wikstrom 2014, Webb et al. 2013a) but this was a theme in a single UK study only (Belsi et al. 2013).

'Transport was another issue, especially in relation to the costs it imposed on residents or, if unable to pay, to the care homes: "transport can be an issue…the care home needs to provide that if the residents have no money to pay the taxi. Normally they need to pay the transport themselves... the hospital can't provide that…" (M11)' Manager [Belsi *UK* 2013]

Evidence Statement 5: Care home resources and infrastructure for oral health care

44 studies described views on how **resources and infrastructure in the home** influenced oral health and care for residents[1-44]. 12 qualitative studies [5 (++)[16,20,22,29,42], 6 (+)[6,7,14,28,36,43], 1 (–)[17]], 27 cross-sectional surveys [5 (++)[2,21,30,39,40], 16 (+)[3,4,5,9,11,12,13,18,19,24,26,27,31,35,41,44], 6 (–)[10,15,23,32,37,38]], 1 (+) mixed methods[1], 1 (++) RCT with CSS data[8], 2 controlled before and after studies [1 (++)[33], 1 (+)[34]] and 1 (+) uncontrolled before and after study[25].

Of these studies 39 related care home resources and infrastructure to oral care **within the care home**[1,3-10,12,13,16-30,32-38,40-44] and 24 related this to **dental care treatment** access[2,6,13,15,17-24,26,27,29,31-34,36,37,39,42,43].

Resources and infrastructure considered to facilitate oral health and care included the presence of an **oral health care aide or champion**[16,34,36,42], **financial resources** to support the delivery of oral care[1,3,4,5,7,16,17,19,20,24,26,27,32,34,35-37], sufficient **equipment and facilities** within the care home[4,6-8,10,12,13,16,18-20,22-26,28-30,33,34,41], **staff time** for oral care[1,3-7,9,10,13,14,16,17,19-28,30,32-36,38,40,43,44] and transport to dental care services[1,4,5,7,11,16,18-20,22,26,29,37].

In general, the evidence is applicable to care homes in the UK since nine studies were conducted in the UK[1,10,11,15,18,22,31,39,44] and the remainder were in countries with similar settings. However, only one UK study[1] identified financial resources as a theme.

[1] Belsi et al. UK 2013 (+); [2] Brister et al. USA 2008 (++);[3] Chalmers et al. USA 1996 (+); [4]

Chalmers et al. Australia 2001 (+); [5] Chung et al. Switzerland 2000 (+); [6] Dharamsi et al. Canada 2009 (+); [7] Finkleman et al. Canada 2013 (+); [8] Fjeld et al. Norway 2014 (++); [9] Forsell et al. Sweden 2010 (+); [10] Gately et al. UK 2011 (–); [11] Hally et al. UK 2003 (+); [12] Jablonski et al. USA 2009 (+); [13] Johnson and Lange USA 1999 (+); [14] Lindqvist et al. Sweden 2013 (+); [15] Longhurst UK 2002 (–); [16] MacEntee et al. Canada 1999 (++); [17] Maramaldi and Cadet USA 2014 (–); [18] Monaghan and Morgan UK 2010 (+); [19] Nunez et al. USA 2011 (+);[20] Paley et al. Australia 2009 (++); [21] Paulsson et al. Sweden 2003 (++); [22] Pratelli and Gelbier UK 1998 (++); [23] Pyle et al. USA 2005 (–); [24] Rabbo et al. Germany 2010 (+); [25] Reed et al. USA 2006 (+); [26] Schembri and Fiske Malta and Gozo 2005 (+); [27] Smith et al. USA 2010 (+); [28] Sonde et al. Sweden 2011 (+); [29] Tham and Hardy Australia 2013 (++); [30] Thole et al. USA 2010 (++); [31] Turner et al. UK 2009 (+); [32] Vergona USA 2005 (–); [33] Wårdh et al. Sweden 2000 (++); [34] Wårdh et al. Sweden 2002a (+); [35] Wårdh et al. Sweden 2012 (+); [36] Wårdh and Wikstrom Sweden 2014 (+); [37] Webb et al. USA 2013a (–); [38] Webb et al. USA 2013b (–); [39] White et al. UK 2009 (++); [40] Willumsen et al. Norway 2012 (++); [41] Wolden et al. Norway 2006 (+); [42] Yoon et al. Canada 2011a (++); [43] Yoon and Steele Canada 2012 (+); [44] Young et al. UK 2008 (+)

Involvement of the dental team with the care home

Personnel-related factors for dental practice staff were described in twenty studies, capturing the views of dentists predominantly with some hygienists and therapists. Much of the focus was on the provision of oral care to elderly individuals, particularly in residential home settings.

In a number of papers dental team members expressed an unwillingness or lack of interest to provide care in residential settings (Antoun et al. 2008, Chalmers et al. 2001, Chowdhry et al. 2011, Dickinson et al. 2012, Hally et al. 2003, Nitschke et al. 2010, Nunez et al. 2011, Paley et al. 2009, Smith et al. 2010, Tham & Hardy 2013). Going to residential homes was seen by members of the dental team as inconvenient (Antoun et al. 2008, Nunez et al. 2011), unappealing (Chowdhry et al. 2011, Dickinson et al. 2012, Hally et al. 2003, Nunez et al. 2011) and/or time-consuming (Chowdhry et al. 2011, Hally et al. 2003, MacEntee et al. 1999, Nitschke et al. 2010). Conversely, a positive attitude to dental care in a residential setting was a facilitator of dental team involvement (Dickinson et al. 2012, Nunez et al. 2011).

The need for a range of additional education was identified by members of the dental team in several studies. General dental practitioners in three studies reported a need for more undergraduate (Antoun et al. 2008, Chalmers et al. 2001) and postgraduate (Hally et al. 2003) teaching in gerodontology and special care dentistry. In addition, two studies highlighted the need for more training in dealing with medically compromised individuals (Hopcraft et al. 2008) and complex medical conditions (Tham & Hardy 2013). In three studies dentists

reported a lack of necessary skills and understanding to deal with residents with cognitive impairments (Chalmers et al. 2001, Chowdhry et al. 2011, Nunez et al. 2011).

> *'Dentists are unfamiliar with residents with dementia…To care for debilitated patients takes specific skills – patience and kindness and ability to cope with confused/dementia patients; these patients can't be placed in a dental chair or be expected to sit'* (Chalmers et al. *Australia* 2001)

This question as to whether dentists had sufficient skill in this area was highlighted by care home staff in a fourth study (McKelvey et al. 2003).

Dental hygienists in two papers also discussed educational needs. Dickinson et al. (2012) identified that hygienists thought that taking on an expanded role in a residential setting was important, but required additional education. Pickard et al. (2005) identified a correlation between how adequate hygienists felt their education had been and the decision to work in a residential setting,

The role of hygienists as an integrated member of the healthcare providing team was seen as a facilitator of oral health in four studies (Pickard et al. 2005, Wårdh et al. 2003, Wårdh & Wickstrom 2014, Yoon & Steele 2012).

> *Dental hygienists working in long-term care felt that they were the ''knowledge experts in the mouth'' and that they held the primary responsibility for promoting health, both oral and general.* (Yoon & Steele *Canada* 2012)

Involvement of dental practice staff in the care home setting was seen as a positive in one additional study (MacEntee et al. 1999) and lack of communication by dental staff as a barrier in another (Chung et al. 2000).

Evidence Statement 6: Involvement of the dental team with the care home

Twenty studies[1-20] discussed the **attitudes of the dental team** to caring for adults in residential care. Eight qualitative studies [4 (++)[9,13,15,17], 4 (+)[10,18-20]] and twelve cross-sectional surveys [2 (++)[2,6], 10 (+)[1,3-5,7,8,11,12,14,16]].

Ten studies report an apparent **unwillingness or lack of interest** from members of the dental health team in providing care in residential settings[1,3,4,6,7,11,13,16,17]. This is variously seen as inconvenient[1,12], unappealing[4,6,7,12] and/or time-consuming[4,7,9,11]. Conversely, a positive attitude to dental care in a residential setting was a facilitator of dental team

involvement[6,12].

The need for a range of **additional education** relevant to care home populations was identified by members of the dental team in nine studies[1,3,4,6-8,12,17].

The involvement of dental practice staff as **member of the healthcare providing team** was seen as a facilitator of oral health in five studies [9,14,18-20], and its lack as a barrier in one study.[5]

The evidence is applicable to care homes in the UK since two studies were conducted in the UK[7,15] and the remainder were in countries with similar settings.

[1]Antoun et al. New Zealand 2008 (+); [2]Arpin et al. Canada 2008 (++); [3]Chalmers et al. Australia 2001 (+); [4]Chowdhry et al. Canada 2011 (+); [5]Chung et al. Switzerland 2000 (+); [6]Dickinson et al. USA 2012 (++); [7]Hally et al. UK 2003 (+); [8]Hopcraft et al. Australia 2008 (+); [9]MacEntee et al. Canada 1999 (++); [10]McKelvey et al. New Zealand 2003 (+); [11]Nitschke et al. Germany 2005 (+); [12]Nunez et al. USA 2011 (+); [13]Paley et al. Australia 2009 (++); [14]Pickard and Ablah USA 2005 (+); [15]Pratelli and Gelbier UK 1998 (++); [16]Smith et al. USA 2010 (+); [17]Tham and Hardy Australia 2013 (++); [18]Wårdh et al. Sweden 2003 (+); [19]Wårdh and Wikstrom Sweden 2014 (+); [20]Yoon and Steele Canada 2012 (+).

Dental service provision to care homes

Dental services provision was highlighted as being relevant to oral healthcare and dental healthcare services in care homes in 33 studies (see Evidence Statement 7).
The access to, availability and convenience of dental services was considered to facilitate oral health and care (often expressed as their absence being a barrier to care) in the majority of studies (24 studies in all).

> *'Most participants believed an appropriate solution to the lack of professional oral care was a regular, visiting dental professional. Caregivers and both high-care and low-care residents agreed this process could reduce any difficulties accessing off-site dental services and could be carried out within a familiar environment with timely, appropriate treatment.'* [Paley *Australia* 2009]

Specific barriers were identified as:

- the ability to provide domiciliary care; often a complex mixture of lack of time, lack of suitable equipment, the complex care and communication issues with the care population, and lack of financial renumeration
- the bureaucracy and paperwork required to provide services, and
- the lack of renumeration or incentives for care provision

'The reasons for not providing domiciliary care included lack of time, insufficient demand, poor domiciliary equipment, lack of emergency back-up, worries regarding quality of treatment while others felt it was the responsibility of the community service to provide such care.' [Hally *UK* 2003]

'Frustration was expressed by a dentist operating an on-site clinic on a fee-for-service basis about the amount of additional paperwork and time required of him by the facility's administration, and about the difficulty of getting dental specialists to provide diagnostic and treatment support. There was also frustration from the feeling that the usual dental fees in the community did not allow for the fact that "it takes longer to sit [the resident] in the chair, and it takes longer to get them out, and they have more needs, and they like to talk ... You don't make the same money compared to private practice."' [MacEntee *Canada* 1999]

Only one study reported a significant socioeconomic effect; Dounis et al (2012) found that women were more likely to go for check-ups than men.

Evidence Statement 7: Dental service provision to care homes

33 studies described views on **dental service provision** to care homes[1-33]. 7 qualitative studies [4 (++)[16,19,21,27], 3 (+)[6,9,33])], 25 cross-sectional surveys [3 (++)[7,28,32], 15 (+)[1,3-5,8,12-14,17,18,20,23,25,26,30], 7 (–)[10,11,15,22,24,29,31]] and one (+) mixed methods study[2].

The **access to, availability and convenience** of dental services was considered to facilitate oral health and care (often expressed as their absence being a barrier to care) in the majority of studies[2,3,6,8,9-12,14-16,18,19,21,23-32].

Similarly, a specific barrier was identified by the dental team as **the ability to provide domiciliary care**; often a complex mixture of lack of time, funding & suitable equipment, and the specialist care and communication issues with the care population[1-3,7,11-27,29,31-33]. The **bureaucracy and paperwork** required to provide services was identified as a specific factor[2,4,16] as was the **lack of renumeration** or incentives for care provision[1-5,12,15,16,18-20,24-26].

The evidence is applicable to care homes in the UK since 8 studies were conducted in the UK[2,10,11,12,15,17,21,32] and the remainder were in countries with similar settings.

[1] Antoun et al. New Zealand 2008 (+); [2] Belsi et al. UK 2013 (+);[3] Chalmers et al. Australia 2001 (+); [4] Chowdhry et al. Canada 2011 (+); [5] Chung et al. Switzerland 2000 (+); [6]Dharamsi et al. Canada 2009 (+); [7] Dickinson et al. USA 2012 (++); [8] Dounis et al. USA 2012 (+); [9] Finkleman et al. Canada 2013 (+); [10] Frenkel UK 1999 (–); [11] Gately et al. UK 2011 (–); [12] Hally et al. UK 2003 (+); [13] Hopcraft et al. Australia 2008 (+); [14] Johnson and Lange USA 1999 (+); [15] Longhurst UK

2002 (–); [16] MacEntee et al. Canada 1999 (++); [17] Monaghan and Morgan UK 2010 (+); [18] Nunez et al. USA 2011 (+); [19] Paley et al. Australia 2009 (++); [20] Pickard and Ablah USA 2005 (+);[21] Pratelli and Gelbier UK 1998 (++); [22] Pyle et al. USA 2005 (–); [23] Rabbo et al. Germany 2010 (+) ; [24]Reznick and Matear Canada 2002 (–); [25]Schembri and Fiske Malta and Gozo 2005 (+); [26]Smith et al. USA 2010 (+); [27]Tham and Hardy Australia 2013 (++); [28] Vanobbergen and De Visschere Belgium 2005 (++); [29]Vergona USA 2005 (–); [30] Wårdh et al. Sweden 2002a (+); [31] Webb et al. USA 2013a (–); [32] White et al. UK 2009 (++); [33]Yoon and Steele Canada 2012 (+)

External resources to support care home residents' oral health

Eight studies highlighted the importance of people external to care homes or dental teams as influencing oral care (see Evidence Statement 8).

Four of these studies were conducted in residential care facilities (Finkleman et al. 2013, MacEntee et al. 1999, Matear and Barbaro 2006, Paley et al. 2009), three were in both care facilities and dental clinics (Nunez et al. 2011, Tham and Hardy 2013, Turner et al. 2009), and one was based in a hospital (Yoon et al. 2011).

Three studies identified support from family members, friends or other residents as a facilitator of good oral health in residents. (Finkleman et al. 2013, Paley et al. 2009, Tham and Hardy 2013)

> *'Off-site dental visits were straightforward for low-care residents as they were generally mobile. Family members helped organise visits and transported them to the dentist or took dentures to a professional for repairs or maintenance. Others were assisted with transport by the facility but this was not as common as private arrangements'*. [Paley et al. *Australia* 2009]

There were contrary opinions as to the importance placed on oral health in 3 studies. In one of these studies (Paley et al. 2009), family members, residents or staff agreed it was important, while in two other studies (MacEntee et al. 1999, Nunez et al. 2011), family members did not consider it was important or it was perceived by dentists that residents and families were not interested in dental care.

> *'Physical exercise so that she is moving about so that she's not lying down, and, if she gets a cold, she's not going to get pneumonia and die? So although I say no [to the priority of dental care], I don't know what I would say yes to!"*
> *Family members were not always aware that there was a dentist attending the facility, probably, as we were told, because dentistry was not a high priority when they selected a facility, and the facility failed to mention it as an integral component of care'.*
> [MacEntee et al. *Canada* 1999]

Evidence Statement 8: External resources to support care home residents' oral health

External factors for example support from relatives and friends were considered to improve oral health, care, and access to professional dental services in 8 studies[1-8]. 5 qualitative studies [4 (++) [2,5,6,8], 1 (+) [1]], 3 cross-sectional surveys [2 (+) [4, 7], 1 (–) [3]].

7 studies[2-8] related the influence of external factors to dental care treatment access and oral care.

Support from family members, friends or other residents was considered a facilitator of good oral health care in three studies[1,5,].

There were contrary views as regards to the importance of oral health care of residents in 3 studies[2,4,5].

The evidence is applicable to care homes in the UK since one study was conducted in the UK[7] and the remainder were in countries with similar settings.

[1]Finkleman et al. Canada 2013 (+), [2]MacEntee et al. Canada 1999 (++), [3]Matear and Barbaro Canada 2006 (–), [4]Nunez et al. USA 2011 (+), [5]Paley et al. Australia 2009 (++), [6]Tham and Hardy Australia 2013 (++), [7]Turner et al. UK 2009 (+), [8]Yoon et al. Canada 2011 (++)

Residents' behaviour, attitude and perception to their oral health

Care home residents' attitudes and behaviours affected oral health and care; this was a major theme in 40 studies (see Evidence Statement 9).

One study was based in a home for adult with disabilities (Jobman et al. 2012), two studies were conducted in dental clinics alone (Arpin et al. 2008, Chowdhry et al. 2011), six studies included participants from care facilities and dental clinics or hospitals (Chalmers et al. 2001, Hally et al. 2003, Nunez et al. 2011, Tham and Hardy 2013, Turner et al. 2009, Yoon and Steele 2012), and the remaining 31 studies were conducted only in residential care facilities.

Residents' not reporting pain or discomfort was considered a barrier in five studies (Arpin et al. 2008, MacEntee et al. 1999, Nitschke et al. 2010, Schembri and Fiske 2005, Tham and Hardy 2013).

> *'They also reported that it was difficult for people with communication problems to report whether they were in pain or not and what the source of pain might be. 'I think one of the biggest things in aged care is communication. You know, a lot of times, you have patients that can't actually tell you what is going on for them, whether their mouth is sore or if they are having any problems. They can't communicate that to you''.* Nurses [Tham *Australia* 2013]

Residents were not willing to ask for help with oral care or treatment at times and this was identified as a barrier in 16 studies (Arpin et al. 2008, Chowdhry et al. 2011, Finkleman et al. 2013, Hally et al. 2003, MacEntee et al. 1999, McKelvey et al. 2003, Nitschke et al. 2010, Rabbo et al. 2010, Schembri and Fiske 2005, Simons et al. 1999, Tham and Hardy 2013, Wårdh et al. 2000, Wårdh et al. 2002b, Webb et al. 2013a, Webb et al. 2013b, Willumsen et al. 2012).

> *'One elderly woman in a facility with a fee-for-service dentist and an on-site clinic complained that "some people think just because you're asking some- thing, you're being disruptive or demanding ... it's not ... easy to ask for things ... It's demeaning." For this woman, weighing the importance of her own particular needs with those of others and the routine of the institution produced a troubling dilemma. Being dependent on the good will of staff for the overall quality of her life, she was aware of the importance of maintaining good relationships by limiting her demands'*. Resident [MacEntee et al. *Canada* 1999]

Twenty studies identified negative resident's attitude or perspective to their oral health as a barrier to oral care. (Arpin et al. 2008, Belsi et al. 2013, Chalmers et al. 1996, Finkleman et al. 2013, Fjeld et al. 2014, Johnson and Lange 1999, Lindqvist et al. 2013, MacEntee et al. 1999, Nitschke et al. 2010, Nunez et al. 2011, Paley et al. 2009, Pratelli and Gelbier 1998, Rabbo et al. 2010, , Tham and Hardy 2013, Wårdh et al. 2000, Wårdh et al. 2002b, Wårdh et al. 2012, Webb et al. 2013a, Willumsen et al. 2012, Wolden et al. 2006)

> *'The main reason they had not used oral health services for over 5 years was not economic, but an absence of perceived need for these services'* Residents [Arpin et al. *Canada* 2008]

> *'The attitudes of residents towards oral care often included comments such as, 'if there is no pain I don't go to the dentist' or 'if not broken leave it alone''*. [Finkleman et al. *Canada* 2013]

Evidence Statement 9: Resident's behaviour, attitude and perception to their oral health

Forty studies described resident's negative behaviour, attitude and perception as a barrier to oral health care. 10 qualitative studies [4 (++)[17,21,22,28], 6 (+)[7,8,16,18,27,39]], 25 cross-sectional surveys [3 (++)[1,29,37], 18 (+)[3-6,10,12-15,19,20,23,25,26,30,34,38,40], 4 (–)[11,31,35,36]], two controlled before and after study [1 (++)[32], 1 (+)[33]], one (++)[9] randomised controlled trial, one (+)[2] mixed method and one (+)[24] uncontrolled before and after study.

Resident's behaviour was regarded as a barrier in all the studies. Examples of such behaviour includes not reporting pain or discomfort[1,17,19,25,28], use of adaptive techniques[8], resistive or challenging behaviour[1-40], a lack of check-up routines[21,28] and not asking for help with oral

care or treatment[1,5,8,12,17,18,19,23,25,26,28,32,33,35-37].

Resident's negative attitude or perception was also identified as a barrier to oral health care in 20 studies[1,2,3,8,9,15-17,19-23,28,32-35,37,38].

The evidence is applicable to care homes in the UK since seven studies were conducted in the UK[2,11,12,22,26,30,40] and the remainder were in countries with similar settings.

[1]Arpin et al. Canada 2008 (++), [2]Belsi et al. UK 2013 (+), [3]Chalmers et al. USA 1996 (+), [4]Chalmers et al. Australia 2001 (+), [5]Chowdhry et al. Canada 2011 (+), [6]Chung et al. Switzerland 2000 (+), [7]Dharamsi et al. Canada 2009 (+), [8]Finkleman et al. Canda 2013 (+), [9]Fjeld et al. Norway 2014 (++), [10]Forsell et al. Sweden 2010 (+), [11]Gately et al. UK 2011 (-), [12]Hally et al. UK 2003 (+), [13]Jablonski et al. USA 2009 (+), [14]Jobman et al. USA 2012 (+), [15]Johnson and Lange USA 1999 (+), [16]Lindqvist et al. Sweden 2013 (+), [17]MacEntee et al. Canada 1999 (++), [18]McKelvey et al. New Zealand 2003 (+), [19]Nitschke et al. Germany 2010 (+), [20]Nunez et al. USA 2011 (+), [21]Paley et al. Australia 2009 (++), [22]Pratelli and Gelbier UK 1998 (++), [23]Rabbo et al. Germany 2010 (+), [24]Reed et al. USA 2006 (+), [25]Schembri and Fiske Malta and Gozo 2005 (+), [26]Simons et al. UK 1999 (+), [27]Sonde et al. Sweden 2011 (+), [28]Tham and Hardy Australia 2013 (++), [29]Thole et al. USA 2010 (++), [30]Turner et al. UK 2009 (+), [31]Vergona USA 2005 (-), [32]Wårdh et al. Sweden 2000 (++), [33]Wårdh et al. Sweden 2002a (+), [34]Wårdh et al. Sweden 2012 (+), [35]Webb et al. USA 2013a (-), [36]Webb et al. USA 2013b (-), [37]Willumsen et al. Norway 2012 (++), [38]Wolden et al. Norway 2006 (+), [39]Yoon and Steele 2012 (+), [40]Young et al. UK 2008 (+)

Resident's general health and mobility: Influence on oral health care

Resident's poor health and mobility was considered a barrier in 24 studies (see Evidence Statement 10). Nine of the studies identified poor general health of residents as a factor which prevented residents from receiving good oral health care. (Chowdhry et al. 2011, Finkleman et al. 2013, McKelvey et al. 2003, Paley et al. 2009, Schembri and Fiske 2005, Sonde et al. 2011, Tham and Hardy 2013, Turner et al. 2009, Webb et al. 2013)

> *'So, that's one thing I am ashamed of, of my teeth…As I said, that's my only sorrow because, believe me or not I had great teeth and now with sickness, I couldn't have them done anymore'.* [Tham *Australia* 2013]

Cognitive health decline was a barrier to oral health and care in 16 studies. Cognitive health was often associated with resistant and uncooperative behaviour, which is difficult to manage. (Chalmers et al. 2001, Gately et al. 2011, Hally et al. 2003, Lindqvist et al. 2013, MacEntee et al. 1999, McKelvey et al. 2003, Nunez et al. 2011, Pickard and Ablah 2005,

Pratelli and Gelbier 1998, Sonde et al. 2011, Tham and Hardy 2013, Turner et al. 2009, Wårdh et al. 2000, Webb et al. 2013, Webb et al. 2013b, Wolden et al. 2006)

> *'A person with dementia may not open his or her mouth however much you urge them, which makes it really difficult. You learn some tricks, and get some tips from the dental hygienists about what to do, but it is not easy…'* Care manager [Lindqvist *Sweden* 2013]

Health conditions were prioritised over and above oral healthcare in eight studies (Finkleman et al. 2013, Gately et al. 2011, Hally et al. 2003, Hopcraft et al. 2008, Johnson and Lange 1999, Lindqvist et al. 2013, Schembri and Fiske 2005, Tham and Hardy 2013)

> *'Oral hygiene has pretty low priority compared with personal hygiene and dealing with medication. Lots of the elderly residents already have eating problems and illnesses, so if they have mouth problems, too, that just complicates everything. If that happens, you need to tackle it. In a position like mine, there's so much to do…'* Medically responsible nurse [Lindqvist *Sweden* 2013].

In five studies, residents' mobility was also a barrier to oral healthcare and getting patients to dental treatment care services. (Belsi et al. 2013, Paley et al. 2009, Tham and Hardy 2013, Turner et al. 2009, Webb et al. 2013).

> *'Most aged care facility clients are frail and it is a huge effort to transport them and wait hours in a central hospital…….'* [Webb *USA* 2013]

Evidence Statement 10: Effect of resident's health and mobility on their oral health

Poor health and mobility amongst residents was a barrier to oral health care in 24 studies[1-24]. 10 cross-sectional surveys [1 (++)[18], 10 (+)[2,3,6-8,12,14,16,19,24], 3 (-)[5,21,22]], 8 qualitative [4(++)[10,13,15,18], 4 (+)[4,9,11,17]], 1 (+) mixed methods[1], and 1 (++) controlled before and after study[20].

9 studies[3,4, 11,13,16,17,18,19,21] described **poor general health** as a factor, which prevented residents from receiving good oral health care. In 17 studies[2,5,6,9,10,11,12,14,15,17,18,19,20,21,22,23,24], **cognitive decline** was considered a barrier to oral health due to difficulty in managing resident's behaviour. Other health conditions and hygiene were considered to be more important than oral health care in 8 studies[4-9,16,18]. 5 studies[1, 13,18,19,21], identified residents' mobility as a barrier to oral health care and accessing dental services.

The evidence is applicable to care homes in the UK since five studies were conducted in the UK[1,5,6,15,19] and the remainder were in countries with similar settings.

[1]Belsi et al. UK 2013 (+), [2]Chalmers et al. Australia 2001 (+), [3]Chowdhry et al. Canada 2011 (+), [4]Finkleman et al. Canada 2013 (+), [5]Gately et al. UK 2011 (-), [6]Hally et al. UK 2003 (+),

[7]Hopcraft et al. Australia 2008 (+), [8]Johnson and Lange USA 1999 (+), [9]Lindqvist et al. Sweden 2013 (+), [10]MacEntee et al. Canada 1999 (++), [11]McKelvey et al. New Zealand 2003 (+), [12]Nunez et al. USA 2011 (+), [13]Paley et al. Australia 2009 (++), [14]Pickard et al. USA 2005 (+), [15]Pratelli and Gelbier UK 1998 (++), [16]Schembri and Fiske Malta and Gozo 2005 (+), [17]Sonde et al. Sweden 2011 (+), [18]Tham and Hardy Australia 2013 (++), [19]Turner et al. UK 2009 (+), [20]Wårdh et al. Sweden 2000 (++), [21]Webb et al. USA 2013 (-), [22]Webb et al. USA 2013b (-), [23]Willumsen et al. Norway 2012 (++), [24]Wolden et al. Norway 2006 (+)

Oral health care resources available to residents

The availability (or corresponding lack of) of oral health care resources for residents arose as a significant theme, and was identified in ten studies (see Evidence Statement 11).

All studies were in elderly residential care settings.

Specific resource related barriers identified for residents were access to dental products such as toothbrushes, paste and denture adhesives (Reed et al. 2006, Schembri and Fiske 2005), the financial costs of care and treatment (Arpin et al. 2008, Chalmers et al. 2001, Finkleman et al. 2013, Nunez et al. 2011, Paley et al. 2009, Webb et al. 2013a); though neither of these were identified in UK-based studies.

> *'Sixty-one per cent of the homes (20) did not provide toothbrushes, toothpastes or denture adhesives for the residents.'* [Schembri *Malta and Gozo* 2005]

> *'Three residents indicated that dental care by a professional was costly and one male low-care resident believed that others in the facility did not want to pay for the services, although they knew it was necessary for dental treatment.'* [Paley *Australia* 2009]

The difficulties of travel to access dental services were also identified (Belsi et al. 2013, Paley et al. 2009, Tham and Hardy 2013).

> *'Limited mobility (p=0.01) and transport issues (p=0.01) were more significant barriers for nursing homes, whereas fear (p=0.02) was a more significant barrier for residential homes (Figure 1).'* Care home managers [Belsi *UK* 2013]

> *'Physical access to the dentist's surgery could be problematic. Difficulties such as organising appropriate transport for wheelchair- bound or immobile residents and the physical restrictions of the surgery environment were barriers to physical access. ……. ''The logistics, she has to get out there...You have to call a taxi, it has to be a maxi taxi and to be able to get into the doors of the dentist…And it would be very hard to put*

mum in a dentist's chair so she would have to stay in the wheelchair.'' Family caregiver' [Paley *Australia* 2009]

Evidence Statement 11: Oral health care resources available to residents

The availability of **oral care resources for residents** was considered to influence oral health care in 10 studies[1-10]. 3 qualitative studies [2 (++)[9,6] and 1 (+)[4]], 5 cross-sectional surveys [1 (++)[1], 3(+)[3,5,8,] 1 (–)[10]], one (+) mixed-methods study[2], and one (+) uncontrolled before and after study[7].

Of these, 2 studies[6,9] described the previous and current **access to dental care** as a facilitator for good oral health care, and 8 studies[1-6,9,10]suggested that a corresponding lack of access acted as a barrier. 2 studies[6,9] described access to domiciliary dental care as a facilitator for good oral health care and four studies[5,6,9,10] identified a corresponding lack of access to domiciliary dental care as a barrier.

Resource-related barriers that were identified included **access to dental products** such as toothbrushes and paste[7,8]; the **financial costs** of care and treatment[1,3-6,10] and the **difficulties of travel** to access services[2,6,9].

The evidence is applicable to care homes in the UK since one study was conducted in the UK[2] and the remainder were in countries with similar settings. However, financial concerns were not identified in the UK study.

[1] Arpin et al. Canada 2008 (++); [2] Belsi et al. UK 2013 (+); [3] Chalmers et al. Australia 2001 (+); [4] Finkleman et al. Canada 2013 (+); [5] Nunez et al. USA 2011 (+); [6]Paley et al. Australia 2009 (++); [7]Reed et al. USA 2006 (+); [8]Schembri and Fiske Malta and Gozo 2005 (+); [9]Tham and Hardy Australia 2013 (++); [10]Webb et al. USA 2013a (–)

Table 1: Overview of included studies

Study & papers	Summary	Population
1. Antoun et al. 2008 (+) (CSS)	Survey questionnaire. To determine beliefs about oral health, willingness to provide care and barriers to treatment.	New Zealand, GDPs. N=437
2. Arpin et al. 2008 (++) (CSS)	Survey questionnaire. Resident's perception of oral health problems and use of dental services.	Canada, Residential and long term care residents. N=152
3. Belsi et al. 2013 (+) (MM/QS)	39-item questionnaire, 11 follow up semi-structured interviews. To determine views on provision of dental care and barriers to care.	UK, Care home mangers. N=152
4. Brister et al. 2008 (++)(CSS)	Enrolment and claims files. To determine the utilization of dental services.	USA, Adults with developmental disabilities in a Residential care facility. N=1423
5. Chalmers et al. 1996 (+)(CSS)	30-item questionnaire and 65 structured interviews. Factors associated with oral care.	USA, Nurse aides. N=488
6. Chalmers et al. 2001 (+)(CSS)	Questionnaire. Attitudes and problems encountered with provision of dental care.	Australia, Dentists (N=413) and nursing home directors of nursing(N=97)
7. Chowdhry et al. 2011 (+)(CSS)	Survey questionnaire. Perceptions and attitudes to care.	Canada, Dentists. N=251
8. Chung et al. 2000 (+)(CSS)	Questionnaires. Attitudes to oral health care issues.	Switzerland, Care home managers (N=65), caregivers (N=169) and physicians (N=18).
9. Cornejo-Ovalle et al. 2013 (+)(CSS)	Questionnaires. Frequency of toothbrushing and denture cleaning	Spain, Caregivers. N=196
10. Dharamsi et al. 2009 (+)(QS)	Survey, 26 semi-structured interviews, audit. Enablers and barriers to provision of mouth care.	Canada, LTC staff. N=90
11. Dickinson et al. 2012 (++)(CSS)	Questionnaire. Preparedness and willingness to treat elderly.	USA, Dental hygienists. N=175
12. Dounis et al. 2012 (+)(CSS)	Survey questionnaire. Perceptions of oral health status and access to dental care.	USA, Residents in assisted living facilities. N= 70
13. Finkleman et al. 2013 (+)(QS)	Interviews/Questionnaire. Impact of dental services on residents and their oral health.	Canada, Residents in LTC. N=61
14. Fjeld et al. 2014	Questionnaires. Benefit of electric toothbrush.	Norway, Nursing home,

(++)(RCT with CSS)		Caregivers. N=152
15. Forsell et al. 2010 (+) (CSS)	Questionnaire. Attitudes and perception towards oral hygiene.	Sweden, Nursing home staff. N= 42
16. Frenkel 1999 (–) (CSS)	Questionnaire. Care home staff attitudes, practices and critical comments on oral health care of dependent clients.	UK. Nursing home N=22, Care home staff N= 416
17. Gately et al. 2011 (-) (CSS)	Questionnaire. Investigation of the provision of oral care and denture hygiene in nursing homes.	UK. Nursing homes N=10.
18. Hally et al. 2003 (+) (CSS)	Questionnaire. Current practice and attitudes of dentists and care home supervisors in provision of oral care to elderly.	Scotland, UK. Dentists N= 88, Care home supervisors N=59
19. Hopcraft et al. 2008 (+) (CSS)	Questionnaire. Factors influencing organisation and provision of dental care for residents.	Victoria, Australia. Dentists N=220, Directors of Nursing of residential aged care facilities N= 163
20. Jablonski et al. 2009 (+) (CSS)	Questionnaire. Knowledge, beliefs, and practice of nursing assistants providing oral hygiene care to elders.	USA. Nursing assistants N=106
21. Jobman et al. 2012 (+) (CSS)	Questionnaire. To determine the comfort, behaviours and barriers experienced by caregivers of special needs individuals.	Iowa, USA. Caregivers N= 428.
22. Johnson and Lange 1999 (+) (CSS)	Questionnaire. To determine availability of on-site dental services, oral health education and preventive programs, future needs, and factors influencing assessment and maintenance of oral health in residents	Nebraska, USA. Directors of Nursing of long-term care facilities N=196
23. Lindqvist et al. 2013 (+) (QS)	Interview. To determine the important aspects of daily oral care based on professional's perspective	Vamland, Sweden. N=23, care managers N= 4, Registered nurses (medically responsible) N=5, Nursing assistants N=13
24. Longhurst 2002 (–) (CSS)	Questionnaire. An audit to find out difficulties with access, availability of dentists and treatment.	UK. Dentists N=148, Nurse managers N=80
25. MacEntee et al. 1999 (++) (QS)	Interviews. Factors influencing oral health care. Secondary analysis: Thorne 2001	Canada. Administrators, staff, dental personnel, residents, and relatives N=109
26. Mahalaha et al. 2009 (+) (CSS)	Questionnaire. Development of a comprehensive sampling frame of nursing home dentists, factors influencing dentists' knowledge of oral cancer (OC)	Ohio, USA. Dentists N= 75

	detection, dentists' opinions and practices towards OC screening competency	
27. Maramaldi and Cadet 2014 (–) **Abstract** (QS)	Interviews. Benefits, barriers and capacity of long-term care facilities to provide oral health care and oral cancer screening	USA. Administrators N=10 focus group interviews
28. Matear and Barbaro 2006 (–) (CSS)	Questionnaire by structured interview. Perceptions of primary caregivers and family members to the provision of oral health care services.	Simcoe County, Canada. Caregivers/family members N= 40
29. McKelvey et al. 2003 (+) (QS)	Interviews. Knowledge and attitude of care home staff	New Zealand. Care home staff N=20. Caregivers N=15, Registered nurse N= 2, Nursing manager N= 1 and Facility manager N= 2
30. Monaghan and Morgan 2010 (+) (CSS)	Questionnaires and structured interviews. Barriers and facilitators to access and care home arrangements to maximise oral health of residents	Wales, UK. Care home managers N= 957
31. Nitschke et al. 2005 (+) (CSS)	Questionnaire/Semi-structured interviews. Barriers to provision of dental care.	Germany. Dentists N=180
32. Nitschke et al. 2010 (+) (CSS)	Structured Interviews. Contrast oral health utilisation patterns of older people with attitudes and utilisation patterns of nursing staff.	Germany. Care staff N=320 (103 administrators, 71 nursing managers and,146 nursing staff), older people N=172
33. Nunez et al. 2011 (+) (CSS)	Questionnaire. Opinions of dentists and Directors of Nursing regarding dental issues, their knowledge of the existence of Iowa dental association program and factors influencing dental care provision in nursing homes	Iowa, USA. Dentists N=400, Directors of Nursing N=200
34. Paley et al. 2009 (++) (QS)	Interviews. Perceptions and attitudes of residents and family members towards oral health, and access to dental services.	Australia. Residents N=21, Family members N=9
35. Paulsson et al. 2003 (++) (CSS)	Questionnaire. Effect of an oral health education program on the knowledge of oral health and on nurses' perceptions of possibility of implementing oral care in patient care. Extensive overlap with Paulsson 1998	Sweden. Nursing personnel N= 2901
36. Pickard and Ablah 2005 (+) (CSS)	Questionnaire. Exploration of the willingness of dental hygienists to work in long-term care facilities	USA. Dental hygienists N= 839

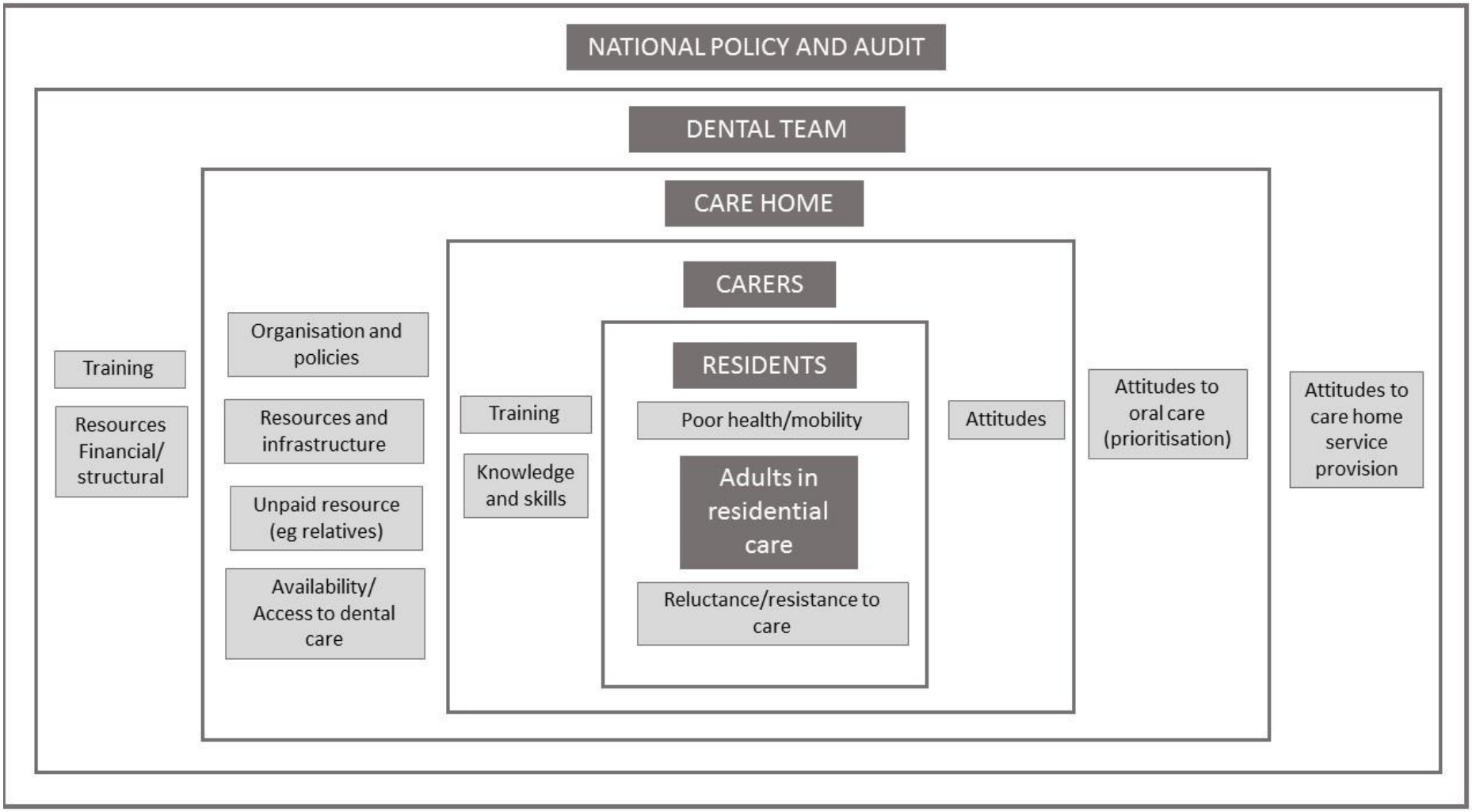
	and factors influencing that decision.	
37. Pratelli and Gelbier 1998 (++) (QS)	Interviews. Care managers' experience in obtaining dental services for residents, their perceptions of current needs and barriers to care	UK. Care managers or representatives N= 75
38. Pyle et al. 1999 (++) (CSS)	Questionnaire. Attitudes and perceptions about oral health in nursing assistants and barriers to provision of care.	USA. Nursing assistants N= 146
39. Pyle et al. 2005 (–) (CSS)	Questionnaire. Facilities' variables influencing oral care delivery and the value placed on oral health by executive directors of long-term care facilities.	USA. Executive directors N= 338
40. Rabbo et al. 2010 (+) (CSS)	Questionnaire. Perceptions and attitudes of nursing home mangers towards oral care and access to dental services	Germany. Nursing home managers N= 114
41. Reed et al. 2006 (+) (UBA)	Questionnaire. Assessment of oral health status and oral health-related quality of life of residents and care provider's attitudes and knowledge of oral health.	USA. Residents N= 137, Care providers N= 22
42. Reznick and Matear 2002 (–) (CSS)	Structured telephone interviews. Perceptions of caregivers on the importance of dental care for institutionalised elderly.	Canada. Caregivers N= 25
43. Schembri and Fiske 2005 (+) (CSS)	Questionnaire. Knowledge of managers and assistance of care home staff concerning residents' oral health and hygiene, evaluation of residents' demand for dental treatment and response of mangers to this.	Malta and Gozo. Home managers N= 33
44. Simons et al. 1999 (+) (CSS)	Questionnaire by structured interview. Attitudes of residents to using antimicrobial chewing gums and opinions of carers about its use.	UK. Residential/nursing homes N= 9, Residents N= 207, Carers N= 47
45. Smith et al. 2010 (+) (CSS)	Questionnaire. Practices and perceived barriers to access.	USA. Alternative long-term care facility N= 508.
46. Sonde et al. 2011 (+) (QS)	Interviews and focus group discussion. Care providers perceptions of and reasoning for the oral care of residents with dementia, and registered nurses' reasoning in relation to their responsibility for monitoring oral care interventions within the regular caregiving routines	Sweden. Care providers N= 9, Registered nurses N= 4
47. Tham and Hardy 2013 (++) (QS)	Interviews and focus group discussion. Perspectives of dentists, care staff and residents	Australia. Dentists N=5, Care home staff N= 16, Residents

	regarding issues in providing and accessing oral health care.	N= 6
48. Thole et al. 2010 (++) (CSS)	Questionnaires. Oral hygiene care activities and attitudes of care providers of mentally retarded residents.	USA. Intermediate Care Facilities for the Mentally Retarded (ICF/MR) N= 3, Care providers N= 138
49. Turner et al. 2009 (+) (CSS)	Questionnaire. Attitudes of dentists and care staff regarding elements that might contribute to an oral health risk assessment protocol	UK. Dentists N= 179, care home managers N= 36, other social care home staff N= 10.
50. Vanobbergen and De Visschere 2005 (++) (CSS)	Questionnaire. Variations in oral hygiene practices and facilities in long-term care institutions	Belgium. Nursing homes N= 16, Caregivers N= 225
51. Vergona 2005 (–) (CSS)	Questionnaire. Perceptions of nursing home directors on dental services.	USA. Directors of Nursing N= 23
52. Wårdh et al. 2000 (++) (QS)	Interviews. Attitudes of nursing staff to oral health care	Sweden. Nursing assistants N= 8, Home-care aides N= 14
53. Wårdh et al. 2002a (+) (CBA with QS)	Interviews. Effect of staff oral health education on residents. Main study report (18 month follow up); linked to Wårdh 2002b and Wårdh 2003	Sweden. Residents N= 66, Nurses N= 63
54. Wårdh et al. 2012 (+) (CSS)	Questionnaire. Attitudes to and knowledge about oral health care among nursing home personnel.	Sweden. Nursing homes N= 12, Nursing home personnel N= 454
55. Wårdh and Wikstrom 2014 (+) (QS)	Interviews. Effect of oral health care intervention using care aides on residents oral microbial level, oral hygiene assistance offered to residents and staff experience of oral health care	Sweden. Care aides N= 3, Dental hygienists N= 2, Residents N = 42
56. Webb et al. 2013a (–) (CSS)	Questionnaires. Perceptions of directors of nursing on the provision of dental care and the difficulties in oral health maintenance of residents.	USA. Directors of Nursing N= 255
57. Webb et al. 2013b (–) (CSS)	Questionnaires. Carers' perceptions on the provision of dental care.	USA. Carers N= 211
58. White et al. 2009 (++) (CSS)	Questionnaires. Description of the oral healthcare and support provided to care home residents.	UK. Care home managers N= 234
59. Willumsen et al. 2012 (++) (CSS)	Clinical examination and questionnaire. Oral hygiene of nursing home patients and nurses' assessments of barriers to improvement.	Norway. Nursing homes N= 11, Patients N= 353, Nurses N= 494

60. Wolden et al. 2006 (+) (CSS)	Questionnaires. Caregivers' perceptions of electric versus manual toothbrushes for institutionalised elderly.	Norway. Caregivers N= 119
61. Yoon et al. 2011(++) (QS)	Observation and questionnaire. Impact of an appreciative inquiry (AI) approach in a nursing knowledge translation initiative to facilitate oral care service delivery improvements. Included in: Yoon 2011 (thesis)	Canada. Nursing staff N= 9
62. Yoon and Steele 2012 (+) (QS)	Focus group interviews. Perspectives of healthcare professionals regarding oral care for long-term residents. Included in: Yoon 2011 (thesis)	Canada. Nursing staff N= 6, speech-language pathologists N= 6, Dental hygienist N= 4, Directors of Care N= 6, Personal support workers N= 6
63. Young et al. 2008 (+) (CSS)	Questionnaire by structured interview. Care home staff knowledge of oral care provision for residents in comparison to NHS Quality Improvement Scotland guidelines. Identification of barriers to oral care and effect of oral health educator training on staff knowledge.	UK. Care homes N= 33, Care home staff N= 109

CSS: Cross sectional survey; CBA: Controlled before and after study; MM: Mixed methods study; QS: Qualitative study;; RCT: Randomised controlled trial; UBA: Uncontrolled before and after study

Figure 1: Conceptual Framework. Review 3



5 Discussion

This review, which examined barriers and facilitators to the implementation of interventions, based on evidence from quantitative and qualitative research, identified 11 factors (themes) that were regarded as influential:

- Care home staff knowledge and skills
- Care home staff attitudes
- Care home staff education and training
- Care home organisation and policy (including communication and accountability)
- Care home resources and infrastructure (staffing, equipment/facilities and financial)
- Dental team involvement and attitudes
- Dental service provision (access and availability)
- External resources (support from relatives and friends)
- Residents' behaviour and attitudes
- Residents' health and mobility
- Residents' ability to access oral health products and dental care

The themes identified showed remarkable consistency across an estimated 17,000 voices from a wide range of population groups, settings, geographic and time periods. These are summarised in a PARiHS framework (Kitson et al., 2008) which illustrates the critical success factors for oral health provision in care homes based on views research (Table 2).

The views research complements the findings from Reviews 1 and 2.

The effectiveness review (Review 1) identified moderate evidence supporting education combined with guidance for carers, and the importance of education and guidance were also identified within the review of best practice (Review 2) and this review. Another shared theme across all three reviews was at the care home level of organisation and policy, identified as protocol introduction and the use of appropriate oral health products in Review 1 and the need for a care protocols, individualised care plas, and regular auditing of policy and process in Review 2. The importance of availability and access to professional dental care was a theme across Reviews 2 and 3.

The linked themes across the three reviews are illustrated in Figure 2 (p. 61).

Strengths and limitations of this review

This review was built on a comprehensive search strategy. The literature search included a thorough attempt to identify relevant published and unpublished studies.

Eleven UK-based studies were identified and the remaining 52 studies had direct applicability to UK settings.

The quality of studies overall was judged as moderate to high with 84% of studies deemed to be of high or moderate quality. The views of a wide range of relevant groups were largely consistent across populations settings and study designs.

Views presented in virtually all the included studies related to care of the elderly, with only two studies focusing on other adult populations. Both these studies related to the oral care of adults with learning difficulties.

There was very little evidence, with no clear findings, relating to variations by gender or other demographic factors.

Table 2: PARiHS Framework: Critical success factors for oral health provision in care homes

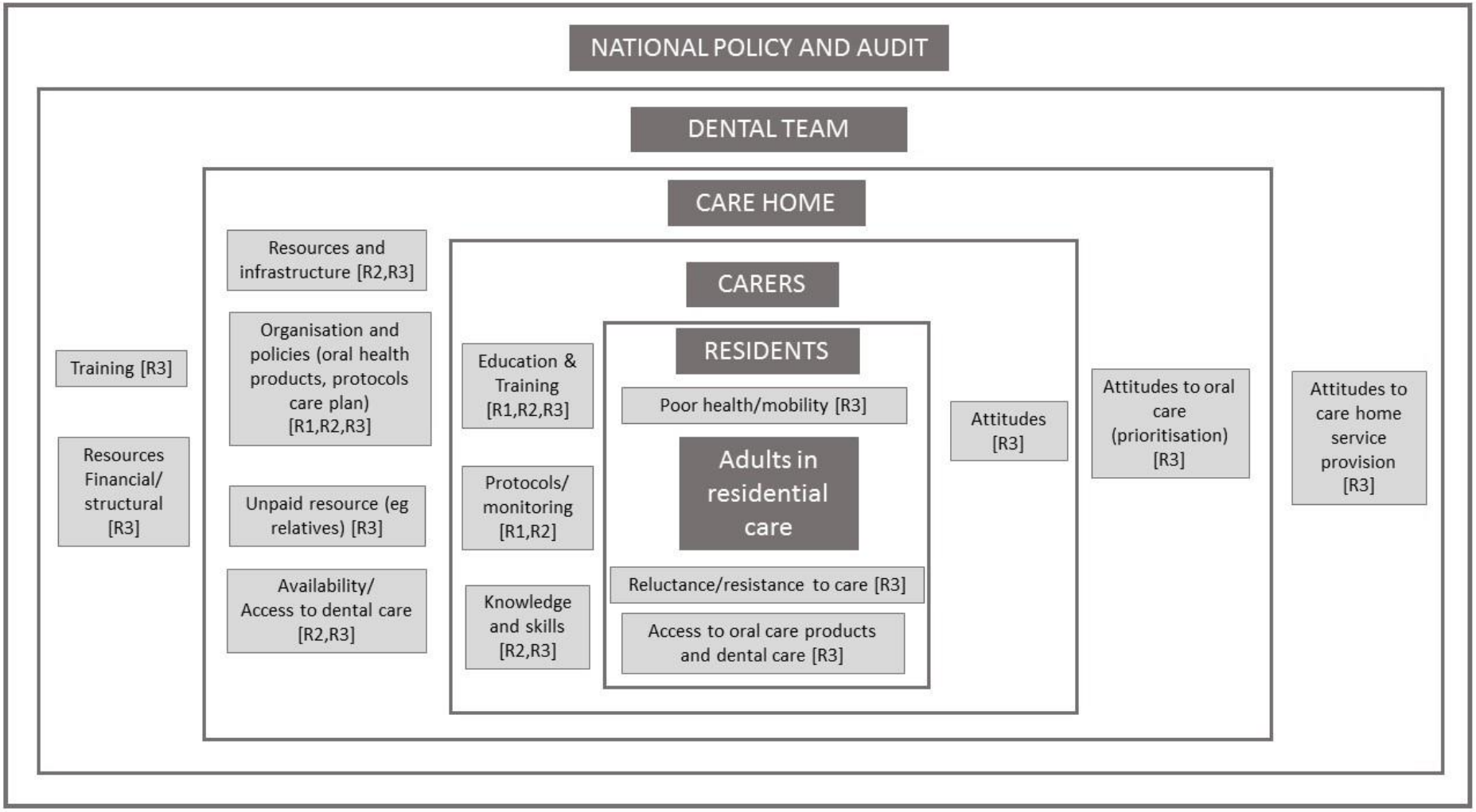
Conceptual frameworks can be useful in better understanding and organising the critical factors for successful implementation of interventions. The Promoting Action on Research Implementation in Health Services (PARiHS) framework proposes that research implementation is influenced by the interplay between three core dimensions: evidence, context and facilitation. Within the PARiHS framework, successful implementation is associated with the evidence supporting its use, the context in which the intervention is being introduced, and the way in which it is facilitated to achieve successful outcomes. The barriers and facilitators are mapped against these core concepts on a high (facilitator) to low (barrier) continuum. This framework has been adapted to map out the *identified* barriers and facilitators to implementation of oral health care provision in care homes for adults.

Dimensions	**LOW implementation (Barriers)**	**HIGH implementation (Facilitators)**
EVIDENCE Could include research evidence, clinical experience, patient experience and local data	**Inadequate or lack of regular oral health education** which limited access to dental care service and good oral health [ES 1,3] **Unwillingness or lack of interest from dental team** to provide care in residential settings; this was seen as inconvenient, unappealing or time consuming [ES 6] **Resident's behaviour, attitude and perception** e.g. unwillingness to ask for help, resistive or challenging behaviour, non-reporting of pain and discomfort [ES 9] **Low priority and importance** given to oral health care of residents [ES 2,3,8]	**Oral health education and training** [ES 1,3] **Involvement of the dental team** in oral care provision and integration of dental staff as part of the healthcare team in care homes [ES 6,7] **Positive behaviour**, attitude and perception of **residents and care staff** [ES 9] **High sense of importance** of dental care [ES 2,3,8]
CONTEXT Socioeconomic context of care home residents (e.g. personal	**Resident's poor general health** and mobility [ES 10] **Lack of external support** from family members [ES 8] **Cognitive decline of residents** which led to poor communication and resistive behaviour [ES 10]	**External support** from family members and friends; could include assisting with transportation to dental clinic [ES 8] **Routines and organisational policies** that ensured regular oral care and dental checks [ES 4]

characteristics, facility resources, organisation and family)	**Absence of or poor implementation of organisational policies** relating to oral health care [ES 4] **Limited resources and infrastructure**; staff not having enough time to maintain oral hygiene of residents, high staff turnover rate, high cost of transportation of residents to dental clinic [ES 5] **Lack of oral health care resources**; this includes lack of access to dental care and dental products such as toothbrushes and paste [ES 5,11]	**Good communication and clear accountability** to ensure policies were followed [ES 4] **Care home resources and infrastructure** e.g. oral health care aide or champion, financial resources to support delivery of oral care, sufficient equipment and facilities within the care homes, staff time for oral care and transport to dental care services [ES 5]
FACILITATION Factors related to the purpose, role, skills, and attributes of health care providers	Care home staff with **limited knowledge and skills** [ES 1] **Negative attitudes** among care staff [ES 2] **Poor dental service provision** e.g. inability to provide domiciliary care, bureaucracy and paperwork, lack of remuneration or incentives for care provision [ES 7] **Dentists lacking the necessary skills and** understanding to deal with residents with cognitive impairments [ES 6]	**Educational programs**- both theoretical and hands-on training **for care staff**, this helped to improve residents access to dental care [ES 3] **A positive attitude** towards the oral care of residents [ES 2] **Access to, availability and convenience of dental services** [ES 2,7] **Undergraduate and postgraduate teaching** in gerodontology and special care dentistry, further training in dealing with medically compromised individuals and those with complex medical conditions [ES 6]

ES: Evidence Statement

Figure 2: Conceptual Framework. Reviews 1-3



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