



How to Implement and Sustain Better Oral Health in Home Care for Older People:

A Realist Mixed Method Case Study

Adrienne Lewis

Adelaide Nursing School

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LIST OF ABBREVIATIONS

AIHW	Australian Institute of Health and Welfare
BOHHC	Better Oral Health in Home Care
CAS	Complex adaptive system
CDC	Consumer directed care
CMOs	Context-Mechanism-Outcome configurations
COAG	Council of Australian Governments
EBI	Evidence-based intervention
EBPAC	Encouraging Better Practice in Aged Care
i-PARIHS	Integrated Promoting Action on Research Implementation in Health Services
KT	Knowledge translation
NPT	Normalisation Process Theory
PARIHS	Promoting Action on Research Implementation in Health Services
RE	Realist Evaluation
SA	South Australian
Time 1	Implementation: 2012–2014
Time 2	Post-implementation: 2017–2018
WHO	World Health Organization

ABSTRACT

Background

Robust evidence demonstrates good oral health is essential for healthy ageing, yet it is described as one of the most neglected aspects of care experienced by older people. The aged care sector's lack of insight into the consequences of poor oral health and inadequate oral health content in entry-level nursing and aged care qualifications are cited as contributing factors. Although various interventions have demonstrated short-term oral healthcare improvements, long-term sustainability has been elusive.

Aim

To identify the factors that influenced the implementation and sustainability of an evidence-based community aged care (home care) model called 'Better Oral Health in Home Care' between Time 1 (implementation, 2012–2014) and Time 2 (post-implementation, 2017–2018). This included evaluating the relevance of the model's learning and teaching package for students undertaking entry-level nursing or aged care qualifications.

Design

The study was a realist mixed method case study based on three interrelated elements of inquiry. Participants included home care staff, clients, students and educators. Qualitative and quantitative data analyses were reported on in three publications. The first publication, guided by the Promoting Action on Research Implementation in Health Services framework, explored the implementation of the model at Time 1. The second publication used the Kirkpatrick model to evaluate the relevance of the learning and teaching package for students undertaking entry-level nursing or aged care qualifications. The third publication applied Normalisation Process Theory with Realist Evaluation to explain the extent to which the model had been embedded in sustainable practice at Time 2.

Results

At Time 1, the model led to improvements in older people's oral health by providing community-based prevention and early detection of oral health problems. Process analysis identified multi-level facilitation as instrumental to the successful development of tailored implementation strategies that were highly suitable to home care. Home care workers' responses to the learning and teaching package were positive; they reported improved oral health knowledge and skills. The package was also found to be relevant for students undertaking entry-level nursing or aged care qualifications. High levels of student and educator satisfaction were reported, with students describing positive attitudes and significant improvements in oral health knowledge and skills. At Time 2, findings showed that ongoing benefits for clients, continued use of the model and sustained home care workforce capacity had not eventuated. A

range of contextual factors were identified, and a lack of facilitation hindered the model's long-term sustainability.

Conclusion

This study uniquely captured the journey from implementation to evaluating sustainability in a way not previously demonstrated in oral healthcare research. The realist approach provided a deeper understanding of how contextual factors influenced the ability of home care staff to implement and sustain oral healthcare at macro, meso and micro levels of practice. This study contributes to a theoretical understanding of the importance of facilitation as a key element in the processes of implementation and sustainability. Practical strategies and recommendations for future research are suggested, highlighting the need for greater inter-sectorial collaboration to embed sustainable evidence-based oral healthcare for older people.

THESIS DECLARATION

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of The University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

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I acknowledge the support I have received for my research through the provision of an Australian Government Research Training Program Scholarship.

Name: Adrienne Lewis

Signature:

Date: 18 December 2018

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CHAPTER 1: INTRODUCTION

The thesis reports on an evidence-based community aged care (home care) intervention called Better Oral Health in Home Care (BOHHC). This intervention was developed by the Building Better Oral Health Communities Project (2012–2014), which was funded by the Australian Government under the Encouraging Better Practice in Aged Care (EBPAC) initiative as a public dental provider and community aged care partnership. The project was commissioned following the success of a previous EBPAC initiative called Better Oral Health in Residential Care (2007–2009). Better Oral Health in Residential Care successfully demonstrated that improvements in residents' oral health could be achieved by adopting a multidisciplinary model incorporating oral health assessment, oral healthcare planning, actioning daily oral care, and referral for dental treatment into routine practice (Fricker & Lewis 2009). In 2010, this approach was disseminated as a national one-off 'train the trainer' program under Australia's first Nursing Home Oral and Dental Health Plan. The aim of the Building Better Oral Health Communities Project (2012–2014) was to translate the residential aged care model to suit the community aged care context. The outcome was the development of the BOHHC model, accompanied by a learning and teaching package tailored to improve home care workers' oral health knowledge and skills.

1.1 Research aim

The overall aim of this research was to better understand how evidence-based interventions can improve the oral health of older people receiving home care. This was achieved by:

- exploring the factors that influenced the implementation of the BOHHC model, referred to as Time 1 (implementation, 2012–2014)
- evaluating the extent to which the BOHHC model had been embedded in sustainable home care practice three years after implementation, referred to as Time 2 (post-implementation 2017–2018), and exploring the factors that influenced this
- determining whether the BOHHC learning and teaching package was effective in improving the oral health knowledge and skills of students undertaking entry-level nursing or aged care qualifications.

1.2 Study overview

The thesis format is by publication. It is based on a realist mixed method case study consisting of three interrelated elements of inquiry reported on in three publications. Table 1 provides a summary of the research aims of each line of inquiry.

Table 1: Summary of research aims

Publication 1	Publication 2	Publication 3
<p>Title ‘Improving oral health for older people in the home care setting: An exploratory implementation study’</p>	<p>Title ‘Evaluating student learning outcomes in oral health knowledge and skills’</p>	<p>Title ‘Can oral healthcare for older people be embedded into routine community aged care practice? A Realist Evaluation using Normalisation Process Theory’</p>
<p>Aim Study aimed to explore how home care providers can support older people to maintain good oral health through appropriate assessment, care plan development, service delivery and referral to dental care by:</p> <ul style="list-style-type: none"> • using the Promoting Action on Research Implementation in Health Services framework to optimise transfer of the model of oral health care used in residential aged care to suit the home care context • describing older people’s levels of oral health improvement following implementation of this model. 	<p>Aim Study aimed to evaluate the relevance of the BOHHC learning and teaching package for three different student groups that were yet to enter the aged care workforce.</p> <p>These groups included: students undertaking a Bachelor of Nursing in order to become registered nurses; students undertaking a Diploma of Nursing in order to become enrolled nurses; and students undertaking a Certificate III in Aged Care in order to become aged care workers.</p> <p>Using the Kirkpatrick model of learning and training, the objectives were to evaluate whether:</p> <ul style="list-style-type: none"> • students found the resources relevant to their learning needs • resources increased the oral health knowledge and skills of students • educators teaching these students found the resources to be relevant to the teaching of oral health as one of the fundamentals of care. 	<p>Aim Study aimed to undertake a Realist Evaluation exploring the embedding of sustainable oral healthcare for older people in routine home care practice by:</p> <ul style="list-style-type: none"> • reviewing how the BOHHC model was designed to work • using the Normalisation Process Theory core constructs as a framework with which to investigate how the BOHHC model had or had not been operationalised as intended by comparing two timeframes: Time 1 and Time 2 • determining what mechanisms helped or hindered its use • explaining what contextual characteristics supported or undermined its use via their influence on the key mechanisms • describing the possible outcomes for home care clients resulting from the interaction between the identified mechanism and contextual characteristics.

Publication 1 addresses the implementation of the BOHHC model at Time 1. This study involved four home care provider sites (involving three different aged care organisations) delivering a range of home care and home support services to non-Indigenous and Indigenous clients situated in metropolitan, regional and country locations in South Australia and New South Wales. This included appointing a home care staff member from each site to work 2.5 days per week as a project officer. Older people were invited to participate if they were a recipient of a home care package or receiving home care support and were eligible for public dental care (holder of a pension or health care card). In total, 319 out of 608 eligible older people consented to participate, with 146 completing the project. The mean age of participants was 73; Indigenous participants were younger than non-Indigenous participants. The gender ratio of participants was 68% female, 32% male. Furthermore, 171 out of 205 home care workers completed staff development training using the BOHHC teaching and learning package. The majority of the staff members were Australian born with a median age of 48 years old. The gender ratio was 91% female, 9% male. The staff profile included 84% home care workers, 13% care coordinators (10% had previously worked as care workers and 3% were nurses) and a small number (3%) were

classified as 'other'. Of the home care worker cohort, 72.3% held relevant aged care qualifications (most commonly a Certificate III in Aged Care).

A parallel evaluation of the BOHHC learning and teaching package, originally developed for home care workers at Time 1, is reported on in Publication 2. This was undertaken with students studying for an entry-level nursing and/or aged care qualification. It involved one university and one large government vocational training organisation, both located in South Australia. The educational resources were used as prescribed study material for Bachelor of Nursing, Diploma of Nursing and Certificate III in Aged Care students. Out of the 204 students involved, 124 completed the evaluation. Six nurse educators (two educators from each of the courses of study) also participated.

Publication 3 reports on the evaluation of the extent to which the BOHHC model had been embedded in sustainable home care practice at Time 2. This involved a South Australian home care provider that participated as a project partner in Time 1 (with two sub-cases: metropolitan and country sites). Of the 14 participants recruited, 12 were representative of various levels of staffing (corporate, managerial, clinical and direct care) and two were consumers. The majority of the participating staff members were female. Employment credentials ranged from Certificate III in Aged Care for care workers and care coordinators, through to nursing, social work and business qualifications for clinical, management and corporate staff. The consumer representatives were both male, with one receiving high care (a Level 4 home care package) and the other receiving low care support (Commonwealth Home Support Programme).

1.3 Thesis structure

The thesis comprises nine chapters, as follows.

Chapter 2: Background and context

Chapter 2 presents a synthesis of the literature and policy issues pertinent to understanding the multidimensional contextual factors influencing the study at Time 1 and Time 2. It explains the rationale behind the development of the BOHHC model as an evidence-based intervention to improve the oral health of older people receiving home care. The chapter summarises the BOHHC model, its oral health care recommendations and its accompanying learning and teaching package, including consumer resources.

Chapter 3: Realism and complexity

Chapter 3 determines realism as the philosophical assumption underlying this study. It critically examines why realism was selected as the most appropriate approach with which to explore the multidimensional contextual factors influencing the implementation and sustainability of the BOHHC

model in routine home care practice. Realism's ontological, epistemological and methodological assumptions are examined.

Chapter 4: Implementation science and sustainability

Chapter 4 builds on the philosophical assumptions of realism by exploring the rapidly evolving literature on implementation science. It investigates the emerging theoretical frameworks and methodological approaches associated with the processes of implementation and sustainability.

Chapter 5: Methodology

Chapter 5 examines the theories, models and frameworks applied in the thesis. This includes the Promoting Action on Research Implementation in Health Services framework, Normalisation Process Theory, Realist Evaluation and the Kirkpatrick model for learning and training evaluation.

Chapter 6: Publication 1

Lewis, A, Kitson, A & Harvey, G 2016, 'Improving oral health for older people in the home care setting: An exploratory implementation study', *Australasian Journal on Ageing*, vol. 35, no.4, pp. 273–280, DOI: 10.1111/ajag.12326.

Chapter 7: Publication 2

Lewis, A, Edward, S, Whiting, G & Donnelly, F 2017, 'Evaluating student learning outcomes in oral health knowledge and skills', *Journal of Clinical Nursing*, vol. 27, no.11–12, pp. 2438–2449, DOI: 10.1111/JOCN.14082.

Chapter 8: Publication 3

Lewis, A, Harvey, G, Hogan, M & Kitson, A 2019, 'Can oral healthcare for older people be embedded into routine community aged care practice? A Realist Evaluation using Normalisation Process Theory' *International Journal of Nursing Studies*, vol. 94, pp. 32-41, DOI: 10.1016/j.ijnurstu.2018.12.016.

Chapter 9: Discussion and conclusion

This final chapter provides an analysis of the thesis aims and findings. It includes examining the theoretical and practical contributions of the research and considers the study's limitations. It highlights the unique nature of this study in capturing the journey from implementation to evaluating sustainability in a way not previously demonstrated in oral healthcare research. The novel approach of applying Normalisation Process Theory with Realist Evaluation contributes to the development of theory-led approaches with which to evaluate sustainability in healthcare. In closing, the study's findings highlight the importance of facilitation as a key active element in the processes of implementation and sustainability and advocates for greater inter-sectorial collaboration to help embed sustainable evidence-based oral healthcare for older people.

CHAPTER 2: BACKGROUND AND CONTEXT

This chapter represents a synthesis of the current literature and of policy issues pertinent to understanding the background to and context of this thesis. In doing so, it explains the rationale behind the implementation of the BOHHC model as an evidence-based intervention to improve the oral health of older people receiving home care. The chapter commences with an overview of the multidimensional contextual factors influencing this study. This includes the changing health and oral health profiles of an ageing population; Australian Government aged care reforms; the increased demand for home care services; characteristics of the home care and home support workforce; and issues regarding access to public dental care. It also identifies oral healthcare as a fundamental of care, linking this to the need for increased oral health literacy and self-care literacy. The term ‘fundamental of care’ refers to the various discrete personal care activities that are essential for a person’s wellbeing regardless of their age, level of dependence, clinical condition and healthcare context (Kitson 2016). These represent the often taken-for-granted self-care activities (commonly referred to as activities of daily living) that have been routinely and independently undertaken by a person throughout their lifetime with little need for deliberate thought, and which may present challenges and/or cause embarrassment when the person can no longer carry them out independently and must rely on others (Kitson et al. 2013, p. 9). An overview of the circumstances that contribute to the neglect of older people’s oral health, and gaps in the oral health knowledge and skills of the aged care workforce, is also provided. The chapter closes with a description of the BOHHC model, including a summary of oral healthcare recommendations and the accompanying learning and teaching package that was developed to support staff to provide better oral healthcare to older people.

2.1 Ageing population

It is well recognised that Australia’s population is rapidly ageing. From 1973 to 2013, the number of people aged 65 and over increased from 1.1 million (9%) to 3.3 million (14%) (AIHW 2014). During this period, there was also a significant increase in the number of people aged 85 and over, from 73,100 to 439,600. Forward estimates predict that by 2053, people aged 65 and over will constitute 21% of the population (8.3 million) and people aged 85 and over will make up 4.2% of the population (1.6 million) (AIHW 2014). A difference in the gender distribution, especially at more advanced ages, is also predicted. The gender ratio stands at 53% female to 47% male at ages 75–79, and 64% female to 36% male for people aged 85 and over (AIHW 2014). In contrast, the older Indigenous population’s age profile is considerably younger than the non-Indigenous age profile. This is due to lower life expectancy and higher fertility rates. Estimates from 2011 showed that 3.4% of the population (22,700) were Indigenous people aged 65 and over (AIHW 2014). While the Indigenous population’s older age profile

is increasing, it is recognised those aged 50 and over have poorer health and higher rates of disability than non-Indigenous people of the same age (AIHW 2014). As with the older non-Indigenous population, Indigenous women outnumber men at older ages. Women represent 52% of Indigenous people aged 50–74 and 61% of those aged 75 and over (AIHW 2014).

2.1.1 Changing health profile

Ageing is generally associated with declining function of most body systems; hence, older people are more likely to have multiple long-term health problems. For example, in 2009, 49% of people aged 65–74 had five or more long-term health problems. This increased to 70% for those aged 85 and over (AIHW 2014). Increased co-morbidities complicate older people's health profiles as disease interrelationships often cause progressive deterioration and a range of associated medical problems (AIHW 2014). Growing numbers of people aged 65 and over are likely to carry higher burdens of lifestyle-related diseases, such as diabetes, than have occurred in previous generations. The complications of diabetes are serious and contribute to the co-morbidities of vascular disease, cardiovascular disease and oral disease (AIHW 2014; Shay 2002; Skamagas et al. 2008; van der Putten et al. 2014). The prevalence of diabetes in older people is about 16.8%; and a further 16.8% are at high risk of diabetes and will most likely present with one or more diabetes-related complications (Dunning et al. 2014, p. 30). Older Indigenous people are over three times more likely to have diabetes than non-Indigenous people (Dunning et al. 2014). Dementia is identified as another significant health problem of an ageing population and is more common in the Indigenous population. The number of people with dementia is predicted to rise from the current 332,000 to about 900,000 by 2050 (AIHW 2014). Recent estimates indicate about one in 10 (9%) people aged 65 and over have dementia, increasing to three in 10 (30%) people aged 85 and over (AIHW 2014). It is known that people with dementia are likely to rely heavily on family and friends, as well as healthcare and aged care services. It is estimated that about 29% of people with dementia are in care accommodation, and about 71% live at home in the community. Older people in residential care are more likely to have moderate or severe dementia. About 40% of people with severe dementia remain living at home (AIHW 2014).

2.1.2 Changing oral health profile

Given the multiple co-morbidities associated with the chronic disease profiles of older people, poor oral health further compromises healthy ageing. Oral health is a significant factor affecting older people's quality of life, overall health and wellbeing. Poor oral health affects a person's ability to eat; it disrupts their sleep and ability to relax; it impacts on their appearance, self-esteem and self-confidence, and their ability to talk and socialise effectively (Chalmers 2003; Coleman 2002; Hoben et al. 2016; Humphrey et al. 2008; Petersen 2009; Watt & Marinho 2005). Oral health and disease are closely linked to general health and disease. In other words, the mouth acts as a portal for disease. Tooth decay, gum disease

and oral cancers share links with medical conditions such as cardiovascular, cerebrovascular and respiratory diseases, to name a few (Chalmers 2003, Hoben et al. 2016; Humphrey et al. 2008; Petersen 2009; Watt & Marinho 2005). Of significance is the finding that gum disease exhibits a bi-directional relationship with diabetes (Humphrey et al. 2008). Diabetes is a high-risk factor for gum disease, which can also lead to other oral infections such as thrush and oral cancers. Poor diabetic control aggravates gum disease. The systemic inflammatory response associated with gum disease, in turn, exacerbates diabetes and worsens cardiovascular complications (Chalmers 2003; Humphrey et al. 2008; Petersen 2009; Watt & Marinho 2005). Poor oral health also contributes to dentally derived infections such as bacteraemia and aspiration pneumonia (Coker et al. 2013; Coleman 2002; Hopcraft et al. 2010). Aspiration pneumonia is a recognised cause of preventable hospital admissions and death of people in older age groups (Claar et al. 2011; El-Solh 2011, Lam et al. 2012; Scannapieco et al. 2003; Sjögren et al. 2008; Terpenning 2005). With the accumulation of dental plaque (oral biofilm) and bacterial colonisation of teeth, gums, tongue and dentures, the mouth serves as a reservoir for recurrent lower respiratory tract infections (Claar et al. 2011; El-Solh 2011; Lam et al. 2012; Scannapieco et al. 2003; Sjögren et al. 2008; Terpenning 2005). This is made worse by the presence of tooth decay, gum disease, dry mouth and swallowing difficulties.

Furthermore, tooth loss significantly affects an older person's ability to chew and eat a variety of foods. This can result in deteriorating dietary intake and compromised nutrition, thus increasing the risk of malnutrition (Hoben et al. 2016). Tooth loss because of tooth decay and gum disease generally results from poor daily oral healthcare, rather than being directly related to the ageing process (Griffin et al. 2012; Steele & Walls 1997; Thomson 2014). In the past, it was common for older people to wear full dentures. Dentures were clinically promoted and socially accepted as a good oral health outcome. Subsequently, older people's dental needs were largely confined to denture care, and oral health became a low priority in the care of older people (Griffin et al. 2012; Steele & Walls 1997; Thomson 2014). However, modern advances in dentistry and water fluoridation have resulted in increasing numbers of people retaining their natural teeth well into old age. For example, in 1979, 78.6% of people aged 75 and over wore full dentures; this declined to 35.7% in 2005. It is predicted that by 2040 only 1% of the Australian population will experience complete loss of teeth (edentulism), including about 6% of people aged 85 and over (Slade et al. 2007). Although the retention of natural teeth undoubtedly improves an older person's quality of life, it also brings with it a range of degenerative oral problems such as tooth wear and fracture. Furthermore, older people's mouths become more complex with increased numbers of heavily restored natural teeth aided by restorative dentistry such as crown and bridgework, partial dentures and implants (Slade et al. 2007). Coupled with this is an increased risk of tooth decay and gum disease (Griffin et al. 2012). This paradox, resulting from the success of modern

dental treatment, means there will be a dramatic increase in the need to support older people in sustaining effective daily oral healthcare and provide access to timely dental care for ongoing maintenance and preventive treatments (Hopcraft et al. 2010).

Tooth decay (including both coronal and root decay) can be defined as an active chronic disease among older people (Australian Dental Association 2014). The occurrence of root decay in older people is related to the presence of dental plaque and food debris on the root surface of teeth and is exacerbated by gum disease (da Silva et al. 2017). Older persons with dementia have particularly high rates of tooth decay (Chalmers & Pearson 2005). Currently, it is known that older people aged 75 and over have a three times greater prevalence of root decay and gum disease than the general population (AIHW 2014; Slade et al. 2007, Thomson 2014). Gum disease starts as inflammation of the gums (gingivitis) in response to bacteria in dental plaque accumulating around the tooth near the gum line (Coker et al. 2013; Slade et al. 2007). It is characterised by redness, swelling or bleeding of the gums. If this goes untreated, the tissue surrounding the tooth becomes inflamed, affecting the gum, ligaments and bone that support the tooth, thus causing tooth loss and pain. This has serious implications for general health (Coker et al. 2013, Slade et al. 2007). The most common cause of gum disease is poor daily oral healthcare, with poor general health a critical determinant of the severity of the disease. Medical co-morbidities, such as diabetes, increase the risk of gum disease. Smoking is also a significant risk factor (Slade et al. 2007).

Another issue affecting good oral health is reduced saliva, generally referred to as dry mouth (xerostomia). Having adequate saliva is important for oral health because the immune factors in saliva inhibit the growth of bacteria that cause tooth decay and gum disease and have an antimicrobial effect on opportunistic respiratory pathogens (Coker et al. 2013). Dry mouth can be caused by diabetes, Sjögren's syndrome, radiotherapy and chemotherapy (Thomson 2014; van der Putten et al. 2014). However, the most common cause is polypharmacy, and given the chronic health profiles of older people, it is not unusual for multiple medications to be prescribed. Reduction in saliva flow is a significant side effect of some medications, especially those with anticholinergic side effects such as antidepressants, respiratory agents, opiate-containing analgesics and some cardiac or antihypertensive drugs (Thomson 2014; van der Putten et al. 2014). Advancing age can also exacerbate this due to age-related changes in the functioning of the salivary glands reducing the saliva production (da Silva et al. 2017). A healthy mouth has a neutral pH; dry mouth (especially in the presence of poor oral healthcare) contributes to a low pH, creating an acidic environment that is unfavourable for the normally occurring bacteria that play a key role in suppressing the colonisation and proliferation of oral pathogens (Coker et al. 2013). Dry mouth, therefore, is an important oral health consideration because it affects a person's

quality of life by causing general oral discomfort, as well as increasing the risk of tooth decay, oral infections and aspiration pneumonia.

Another common problem in the older population is oral thrush (oral candidiasis), especially in the presence of poor oral healthcare and dry mouth. The use of dentures is recognised as a contributing factor. Dentures are known to reduce the oral pH, salivary flow and the contact of the tongue with oral tissues, thus increasing the risk of oral thrush infection. In addition, the acrylic surface of dentures can act as a reservoir for thrush, aggravating infection and allowing for reinfection following treatment (da Silva et al. 2017). Lastly, oral cancers are also mostly diagnosed in older age groups. Oral cancers affect the lips, tongue, salivary glands, gums, floor of the mouth and back of the throat, and together they comprise the seventh most common cancer in Australia (Slade et al. 2007). Many oral cancers are associated with smoking and alcohol use; lip cancers are often related to sun exposure (Thomson 2014).

In summary, oral diseases are recognised as a significant public health problem (da Silva et al. 2017; Griffin et al. 2012). Available estimates indicate that 54% of people aged 65 and over suffer poor oral health (Econtech 2007). Dental conditions also rate very high in terms of potentially preventable hospital admissions, with tooth decay, gum disease and oral cancers contributing most to the burden of oral disease (Katterl et al. 2012). In Australia, oral conditions are the second most expensive disease group to treat after cardiovascular disease. Economic analyses have estimated the total cost of poor oral health in older people to be about \$750 million per annum. Direct costs account for 45% of this amount, and indirect costs account for 55% (Econtech 2007). Moreover, good standards of oral healthcare become more difficult to achieve as people age, and are often complicated by functional dependence, physical frailty, existing general illnesses and chronic diseases, polypharmacy, cognitive impairment and reliance on others for personal care (Chalmers & Pearson 2005). Older people who suffer from dementia are further compromised by changed behaviours and their inability to reliably report their experience of oral health problems and dental pain (Chalmers & Pearson 2005; Jablonski et al. 2011). Older people who visit a dental professional for regular check-ups are more likely to benefit from early detection and treatment of oral disease and conditions; however, known reasons deter older people from seeing a dental professional. These relate to physical and cognitive impairment, and difficulties with transport (Slack-Smith et al. 2010). Past negative experiences, anxiety and dissatisfaction with dental services, and affordability of dental care are also recognised as barriers (Armfield et al. 2009; Slack-Smith et al. 2010). Furthermore, many health professionals, as well as older people and their families, incorrectly assume that oral conditions and diseases are a natural part of growing old (Nitschke et al. 2010). The cumulative effect of these factors often means many older people see a dental professional only when they have an urgent painful problem (Armfield et al. 2009; Slack-Smith et al.

2010). Consequently, the need for older people to maintain good oral health will become increasingly important as the high-risk consequences of poor oral health place increased demands on general healthcare and dental care services and contribute to the complexity of aged care provision (Steele & Walls 1997).

2.2 Aged care sector

Australia's rapidly ageing population will dramatically increase the need for formal aged care services. Over the next 40 years, the use of aged care services is predicted to increase by 250%, with around 10.3% (3.5 million) of older people using aged care services. It is estimated 80% of aged care services will be delivered in the home care setting, with the remaining 20% in residential aged care facilities (Access Economics 2010; Australian Government Department of Health 2018; National Aged Care Alliance 2014). It is anticipated that there will be decreased numbers of family members and friends acting as informal carers. As a result, increasing numbers of older people will be reliant on the formal aged care system. Furthermore, the expected increases in the incidence of dementia and other age-related chronic illnesses will result in a growing necessity for the provision of more complex aged care (Access Economics 2010; Australian Government Department of Health 2018; National Aged Care Alliance 2014). The Australian Government responded to these forecast challenges with the introduction of major aged care reforms in April 2012. These reforms placed a strong emphasis on supporting healthy ageing, and reflected a shift in the way global health systems are being transformed to meet the needs of an ageing population (WHO 2015). This has involved changing the focus from managing disease to strengthening older people's intrinsic capacity through a wellness and reablement approach, rebuilding the health system to provide more person-centred and integrated care to older people, and transforming the health workforce so that it can better provide the care that these new systems require (WHO 2015). Table 2 provides a summary of the key aged care policy factors pertinent to the study at Time 1 and Time 2.

Table 2: Summary of key aged care policy factors

Time 1 (implementation, 2012–2014)	Time 2 (post-implementation, 2017– 2018)
Aged care reforms	
<ul style="list-style-type: none"> • Introduction of the My Aged Care website portal: <ul style="list-style-type: none"> ○ entry point to the aged care system ○ interface between clients, assessors and aged care service providers • Restructuring of the Community Packaged Care Program to form the Commonwealth-funded Home Care Packages Program • Introduction of a new model of service delivery called consumer directed care (CDC). 	<ul style="list-style-type: none"> • Enhancements to My Aged Care: <ul style="list-style-type: none"> ○ advanced client assessment and record-keeping capability ○ service availability and specialisation including fees and charges • The National Aged Care Assessment Framework and Tool • National Screening and Assessment Form for use by aged care assessment teams to determine eligibility for the Home Care Packages Program or entry into residential care • Commonwealth Home Support Programme introduced for older people requiring entry-level support services • A regional assessment service established for Commonwealth Home Support Programme assessment • Government funding given to the consumer and not the home care provider.
Accreditation standards	
<p>Home Care Standards:</p> <ul style="list-style-type: none"> • Standard 1: Effective management • Standard 2: Appropriate access and service delivery • Standard 3: Service user rights and responsibilities. 	<p>New Aged Care Quality Standards:</p> <ul style="list-style-type: none"> • Standard 1: Consumer dignity and choice • Standard 2: Ongoing assessment and planning with consumers • Standard 3: Personal care and clinical care • Standard 4: Services and supports for daily living • Standard 5: Organisations' service environment • Standard 6: Feedback and complaints • Standard 7: Human resources • Standard 8: Organisational governance.
Home care and home support aged care workforce	
<p>2012 Census, home care workforce:</p> <ul style="list-style-type: none"> • Female dominated • Mean age 50 years • Home care workers (81%) • Registered nurses (8%) • Enrolled nurses (4%) • 2/3 of home care workers had a certificate-level qualification in an aged care related field. 	<p>2016 Census, home care workforce:</p> <ul style="list-style-type: none"> • Female dominated • Mean age 52 years • Home care workers (84%) • Registered nurses (8%) • Enrolled nurses (2%) • 3/4 home care workers had a certificate-level qualification in an aged care related field.
Access to public dental care	
<ul style="list-style-type: none"> • Australia's first Oral Health Plan (2004–2013) • Multidisciplinary approach to oral health assessment and support for the maintenance of daily oral care and improved access to timely dental care for older people • Public dental care eligibility: adults must have a Centrelink healthcare or pension card • Co-payment requirements differ between States and Territories • A priority public dental pathway (by-passing the waiting list) put in place for home care clients referred by Better Oral Health Care Project. 	<ul style="list-style-type: none"> • Australia's subsequent Oral Health Plan (2015–2024) • Multidisciplinary approach to oral health assessment and support for the maintenance of daily oral care and improved access to timely dental care for older people • Public dental care eligibility: adults must have a Centrelink healthcare or pension card • In South Australia, a co-payment applied for adults • A priority public dental pathway, under a SA Dental Service-funded Community Aged Care Program, was available for participating home care providers' clients.

2.2.1 Aged care reforms

At Time 1, the introduction of My Aged Care in July 2013, heralded the beginning of a more streamlined and market-based aged care system in Australia (Australian Government Department of Health 2017a). The Aged Care Gateway, introduced as a national call centre and website, is representative of a single national entry point into formal aged care. Over time, the gateway has increased in functionality to undertake assessments for the Australian Government-funded aged care services, hold a centralised electronic client record system and provide a service-matching and referral service for consumers (Australian Government Department of Health 2017a; National Aged Care Alliance 2014).

During Time 1 and Time 2, a significant restructuring of aged care services has taken place, and currently consists of the Commonwealth Home Support Programme, the Home Care Package Program and Residential Care (Australian Government Department of Health 2017a). At Time 1, Home Care Package Program reform began in August 2013, replacing the former Community Packaged Care Program with additional levels of care, including a dementia supplement applied across the all care packages. It also included the staged introduction of a new model of care called consumer directed care (CDC), which was designed to provide older people with more choice and flexibility, including more control over the types of care and services that they choose to access (Australian Government Department of Social Services, 2015). Furthermore, as of July 2015, several programs such as the of Commonwealth Home and Community Care Program, National Respite for Carers Program, the Day Therapy Centre Program and Assistance with Care and Housing for the Aged Program were combined to become the Commonwealth Home Support Programme (Australian Government Department of Health 2017a). The proposed next stage of community aged care reforms is the merger of the Commonwealth Home Support Programme and Home Care Package Program. Furthermore, a National Aged Care Assessment Framework and Tool and a National Assessment Form were introduced in July 2015 to ensure a consistent approach to aged care assessment and referral to appropriate aged care services. At Time 2, Level 1 assessment (for older people with low needs and basic service provision) and Level 2 assessment (for older people who have mild to moderate needs and require access to more than a couple of basic services) came under the Commonwealth Home Support Programme and was coordinated by regional aged care service teams (Australian Government Department of Health 2018). Level 3 assessment (for older people who have moderate to high and or complex needs) required a comprehensive assessment undertaken by aged care assessment teams; this determined access to the Home Care Package Program or entry into residential aged care (National Aged Care Alliance 2014). Since the launch of the reforms in 2013, there has been a rapid increase in the number and specialisation of home care and/or home support providers in the community aged care sector (Mavromaras et al. 2017). Furthermore, given that the number of home care packages available is capped by the Australian Government, high consumer demand has resulted in a supply-versus-demand

gap, with some older people in need of high care wait-listed on an interim home care package, usually for care that is less than their assessed need (Australian Government Department of Health 2017b).

2.2.2 Accreditation standards

Home Care Standards are the legislative framework for approved home care providers. They also represent broader community aged care reforms that began in 2005 with the aim of developing common arrangements to streamline the way home care is delivered. During Time 1, the Community Care Common Standards replaced the Home and Community Care National Service Standards. A further change took place in August 2013 when the standards were renamed the Home Care Standards (Australian Government Department of Health and Ageing 2010). At Time 2, in 2017, additional consultation had occurred with the aim to increase care consistency across the aged care sector by creating a new set of quality standards to apply to all aged care services (including residential care, home and flexible care). Subject to government agreement and changes to aged care legislation, it has been proposed that the new standards will take effect from 1 July 2019. Central to these standards is a focus on quality and safety for older people, and the promotion of quality of life and wellbeing (Australian Government Department of Health 2017b). Accreditation under these standards mandates that an aged care provider must be able to provide safe and effective services that optimise an older person's independence, health, wellbeing and quality of life. This includes having a sufficiently skilled and qualified workforce to provide safe, respectful and high-quality care and services. A strong emphasis has been placed on older people being able to make informed choices about their care and services, including being informed about the risks, the potential consequences to themselves and others, and how risk can be managed to assist them to live the life they choose. Consumer information is to be current, accurate, timely and communicated in a way that supports the older person's understanding and dignity of risk. Assessment and planning are to have a focus on optimising health and wellbeing in accordance with the older person's needs, goals and preferences. Personal care and clinical care are to be safe, effective and conducted in accordance with best practice, including timely referrals to other providers when necessary (Australian Government Department of Health 2017b).

2.2.3 Home care and home support aged care workforce

The predicted higher use of health services by older people has implications for the aged care workforce. An ageing population will require an adequate aged care workforce in terms of numbers, distribution and skills-set to meet changing needs and increased demand. Shortages of appropriately skilled workers are predicted to be a major challenge (King et al. 2012). Although doctors and allied health professionals contribute to aged care service provision, the direct care aspect of the aged care workforce generally comprises of three main occupational groups: registered nurses, enrolled nurses and care workers (King et al. 2012). Little was known about the Australian aged care workforce until

2003 when the first major survey took place in residential care (King et al. 2012). This was repeated in 2007 and included the community aged care workforce for the first time (King et al. 2012). The direct care aspect of the home care and home support aged care workforce has been described as having a somewhat different profile from that in residential aged care. Although it has similar occupational groups, there is a difference in distribution and a reduction in the share of the more highly educated workforce groups (King et al. 2012). During Time 1 and Time 2 (as described in Table 3 and Graph 1), it can be seen that care workers represented the largest occupational group, with the latest 2016 survey reporting a 13% reduction in total workforce numbers (Mavromaras et al. 2017). The home care and home support direct care workforce is predominantly female (Graph 2), and was described in 2016 as a workforce that was getting older, with a mean age of 54 (Graph 3) (Mavromaras et al. 2017). The proportion of overseas-born workers decreased from 28% in 2012 to 23% in 2016 (Table 4). Aboriginal and Torres Strait Islander people represented 2% of the home care and home support direct care workforce in 2016 (Mavromaras et al. 2017).

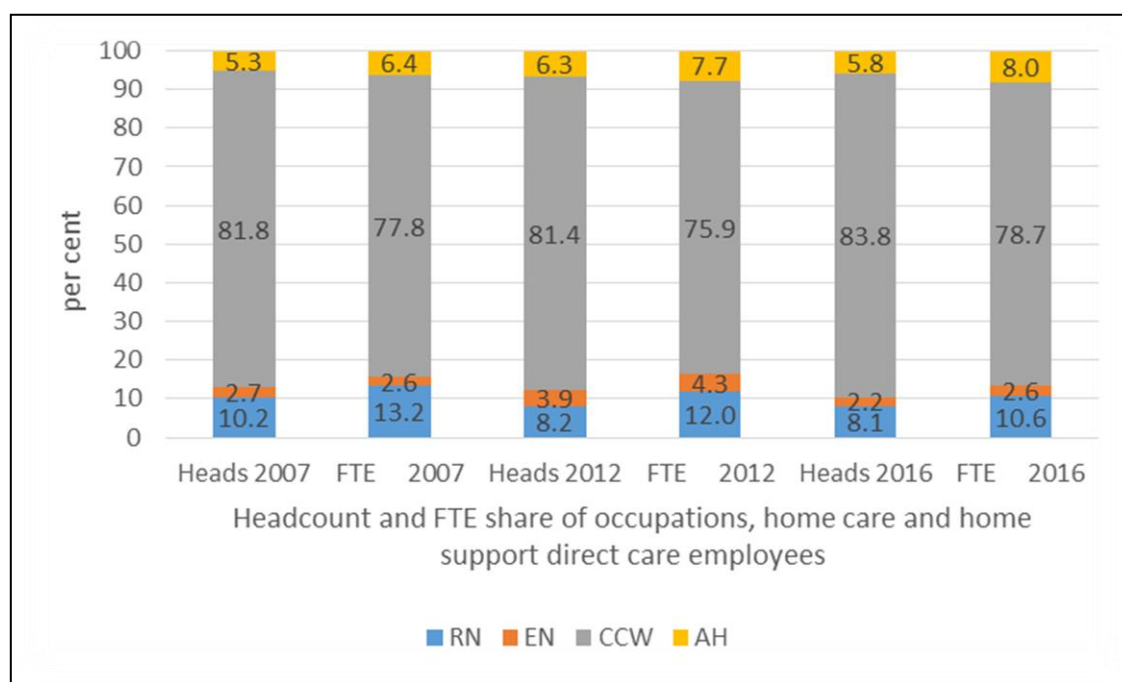
The types of qualifications held reflect occupational roles. The 2016 survey indicated that registered nurses mostly have a bachelor's degree in nursing (78%), with many having other nursing or health-related qualifications; 86% of enrolled nurses have a Certificate IV or Diploma in Nursing; and community care workers generally have certificate-level qualifications in aged care (51% Certificate III, 12% Certificate IV) (Mavromaras et al. 2017, p. 79). However, although 19% of care workers held an Aged Care or Service Coordination Certificate IV qualification in 2012, this had fallen to 15% in 2016 (Mavromaras et al. 2017, p. 79). In addition, the 2016 survey reported that compared with workers in all other occupations, a much smaller proportion of care workers undertook any form of training, suggesting that the training gap between care workers and the rest of the workforce is set to intensify (Mavromaras et al. 2017, p. 88).

Table 3: Direct care employees in the home care and home support aged care workforce, by occupation, 2007, 2012 and 2016

Occupation	Estimated headcount (per cent of workforce)		
	2007	2012	2016
Nurse practitioner	n/a	201 (0.2)	53 (0.1)
Registered nurse	7,555 (10.2)	7,631 (8.2)	6,969 (8.1)
Enrolled nurse	2,000 (2.7)	3,641 (3.9)	1,888 (2.2)
Community care worker	60,587 (81.8)	76,046 (81.4)	72,495 (83.8)
Allied health professional*	3,925 (5.3)	3,921 (4.2)	4,062 (4.7)
Allied health assistant*		1,919 (2.1)	995 (1.2)
Total number of employees (headcount) (%)	74,067 100	93,359 100	86,463 100

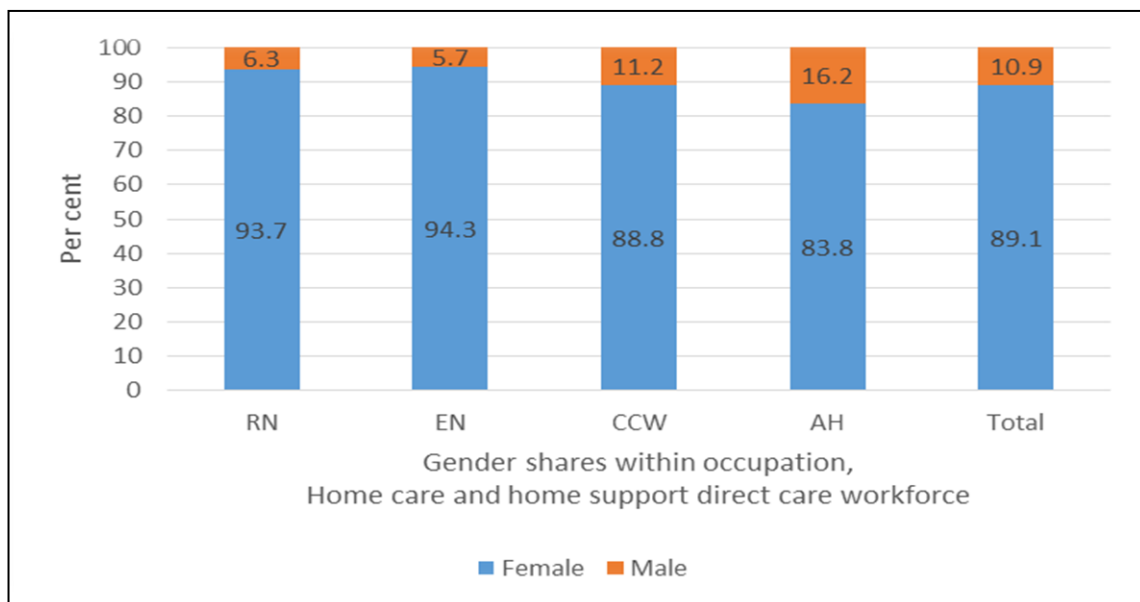
*Note: in 2007, these categories were combined under allied health.

Source: Mavromaras et al. 2017, p. 70.



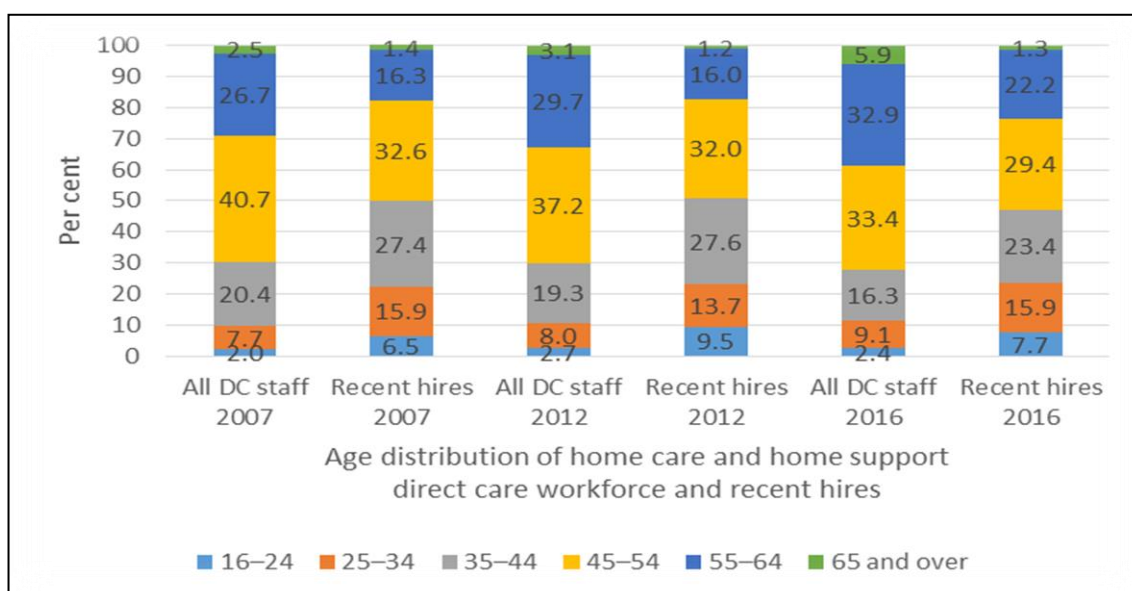
Graph 1: Distribution of occupations among home care and home support direct care employees

Source: Mavromaras et al. 2017, p. 71.



Graph 2: Gender distribution of the home care and home support aged care workforce 2016

Source: Mavromaras et al. 2017, p. 74.



Graph 3: Age distribution of the home care and home support aged care workforce, 2007, 2012 and 2016

Source: Mavromaras et al. 2017, p. 73.

Table 4: Country of birth of the home care and home support direct care workforce, all direct care employees and recent hires, 2007, 2012 and 2016

Country of birth	All direct care employees (%)			Recent hires (%) *		
	2007	2012	2016	2007	2012	2016
Australia	73.3	72.2	77.1	69.0	70.1	79.3
Other	26.7	27.8	22.9	31.0	29.9	20.7
Total	100	100	100	100	100	100

* Recent hires were those employed for 12 months or less.

Source: Mavromaras et al. 2017, p. 75.

2.2.4 Older people's access to public dental care

The Australian dental sector developed separately from Australia's general health services, and predominantly by private service providers. This separation resulted in the dental sector evolving as a set of independent services without systematic coordination and with few formal linkages to and communication pathways with general health services (Biggs 2008). In contrast to general healthcare, which is predominantly funded through Medicare, only about 18–19% of total dental care is publicly funded by the Australian Government (Australian Dental Association 2014, Chrisopoulos & Harford 2013). For example, in 2011/2012, individuals were personally responsible for 57% of the total cost of dental care, compared with only 12% of general healthcare costs (Australian Dental Association 2014).

During Time 1 and Time 2, eligibility for public dental care was restricted to persons who were on low incomes, such as holders of Centrelink concession cards (a healthcare card or pension card). In addition, some public dental providers (such as SA Dental Service) charged client co-payments for dental treatment. In 2014, it was cited that 72% of people aged 65 and over held a concession card and were therefore eligible for public dental care (Australian Dental Association 2014). However, because of frequent long public dental care waiting lists, timely access to dental treatment may not always be possible, and older people's oral health may deteriorate while they wait for care (Australian Dental Association 2014; National Advisory Committee on Oral Health 2004).

Older people have traditionally been on the margins of public oral health policy. However, current Australian Government dental reforms seek to improve access to more timely government-subsidised dental care (Biggs 2012). During Time 1 and Time 2, Australia's first (2004–2013) and second (2015–2024) National Oral Health Plans advocated for the promotion of multidisciplinary approaches to oral health assessment, support for the maintenance of daily oral healthcare and improved access to affordable, timely and preventive oral healthcare for older people (COAG 2015; National Advisory Committee on Oral Health 2004). At Time 1, home care providers participating in the study were supported by public dental providers in South Australia and New South Wales to adopt a home care team approach through the BOHHC model. Home care clients were provided with access to a priority public dental care pathway (by-passing the waiting list). At Time 2, in South Australia, the public dental provider continued to provide priority dental referral through a specific program dedicated to community aged care.

2.3 Oral health as a fundamental of care

It is known that many of the common oral diseases associated with an ageing population can be primarily prevented and/or managed by effective daily oral healthcare and timely dental referral (Bissett & Preshaw 2011; Fitzpatrick 2000; Janssens et al. 2016; Knevel et al. 2016). Although older people may or may not visit a dental professional on a regular basis, those receiving aged care services develop

ongoing relationships with staff who are responsible for assessing and monitoring their health status, as well as advising, guiding and supporting the provision of fundamentals of care. As listed in Figure 1, the fundamentals of care include physical activities such as personal cleansing, being fed, hydrated and dressed, feeling comfortable, rested, mobile and safe, and psychosocial aspects such as keeping calm, coping, and feeling respected, involved, informed and dignified (Kitson et al. 2013). Of significance to this thesis is the recognition that the provision of oral healthcare is an integral aspect of fundamental care (Coker et al. 2013; Kitson et al. 2014). As long ago as 1960, in terms of Virginia Henderson's (1960) work on the basic principles of nursing care, it was considered that the overall standard of care provided to a person could be judged by the condition of their mouth (Coleman 2002, p. 193).

Fundamentals of care
<ul style="list-style-type: none">• Safety, prevention and medication• Communication and education• Respiration• Eating and drinking• Elimination• Personal cleansing and dressing• Temperature control• Rest and sleep• Comfort (including pain management)• Dignity• Privacy• Respecting choice• Mobility• Expressing sexuality.

Figure 1: Fundamentals of care

Source: Kitson et al. 2014, p. 333.

Fundamentals of care are conceptualised as a framework (Figure 2) that consists of three interrelated dimensions underpinned by the principle of person-centred care. Person-centred care is based on the premise that clients should actively participate in informed decision-making so that they are involved in the development of individualised care plans that reflect their physical, psychosocial, cultural and emotional needs and choices, and that this takes place in a healthcare context that genuinely promotes and sustains this approach to care (Kitson 2016; Kitson et al. 2014). When applying the fundamentals of care framework to the home care setting, the home care worker and older person relationship should be at the core of the first dimension (Kitson 2016). The ability of the home care worker to connect with the older person is essential to safeguarding the relationship for both the older person and the home care worker in subsequent episodes of care (Kitson 2016). Being assisted, as required, with basic care needs, such as brushing teeth and or dentures, can be a source of embarrassment and/or distress for older people (Kitson 2016). Therefore, to reduce embarrassment, home care workers must connect meaningfully with the older person and treat them with compassion and respect (Kitson 2016). The

second dimension involves the actioning of fundamental care. This process acknowledges that every physical activity involves more than the completion of a task, or the delivery of a service, as it also requires the management of several psychosocial and relational elements that are contingent on the person's self-care ability and the involvement of others such as the older person's family (Kitson 2016; Kitson et al. 2014). The third dimension considers the effects of the context in which the care is taking place. For example, the provision of care to an older person in a home care setting is undertaken differently to that which takes place in a residential aged care setting or an acute hospital setting. This dimension also considers the influence of other factors such as the availability of resources, the characteristics of the workforce, the type of leadership present and the broader policy and regulatory issues that affect the ability to provide person-centred care (Jefferis et al. 2016; Kitson et al. 2014).

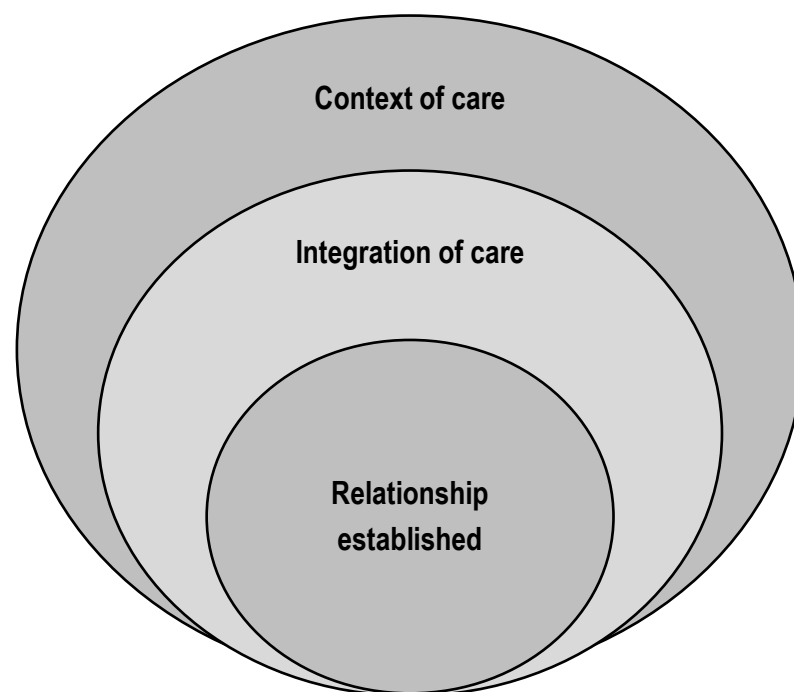


Figure 2: Fundamentals of care framework

Source: Kitson 2016, p. 13.

2.3.1 Oral health literacy and self-care literacy

Self-care impairment is undeniably a phenomenon of an ageing population. With regard to oral healthcare, even for healthy older people, the ability to self-care may be complicated by one or more of a range of factors. This may vary from impaired visual acuity; diminished manual dexterity; arthritic conditions affecting hand grip strength and range of motion in the wrist, elbow and shoulder; the presence of dry mouth; increased surface area of teeth and the exposure of tooth roots due to prior gum disease and/or the presence of permanent or removable dental prostheses replacing missing teeth; as well as the person's ability access to dental services (Coker et al. 2016; de Lugt-Lustig et al. 2013; Slack-Smith et al. 2010; Terpenning & Shay 2002). Self-care perceptions may also be influenced by

older people themselves passively accepting deteriorating oral health as a natural consequence of ageing, informed by the misconception that oral health should be accorded lower priority compared to other aspects of physical care (Nogueira et al. 2017; Slack-Smith et al. 2010).

Given these factors, maintaining good oral health is not only contingent on an older person's ability to self-care, but also involves their level of oral health literacy and oral health self-care literacy. Health literacy is important for ensuring a person's understanding and knowledge about how to manage their health needs. Care literacy, on the other hand, seeks to ensure that a person understands their self-care needs, and accordingly knows how to care for themselves (Kitson 2016). Home care workers are well placed to provide advice, and to guide and support older people in terms of both health literacy and self-care literacy, especially when it comes to strategies designed to maximise older people's intrinsic self-care capacity to promote wellbeing and reablement. With regard to oral healthcare, this is relevant for home care providers in their role of supporting older people to age well at home, particularly as studies have shown that when the oral health needs of frail community living older people are not met, their oral health rapidly deteriorates (Chalmers et al. 2000; Chalmers et al. 2001; de Lugt-Lustig et al. 2013).

2.3.2 Issues of oral healthcare neglect

The fundamentals of care usually represent low cost aspects of a person's care needs. However, failure to implement this basic care is likely to lead to wider and higher cost consequences concerning quality and safety healthcare issues, as well as poor consumer experience (Kitson et al. 2013). For example, as a minimal, low cost intervention, effective oral healthcare can produce maximum benefits in terms of an older person's quality of life and decrease the risk of serious conditions and infections (such as malnutrition, poor diabetic control, aspiration pneumonia and bacteraemia). Effective oral healthcare can, in turn, prevent unnecessary hospitalisation and premature death (Coker et al. 2013; Coleman 2002; Coleman & Watson 2006; Hoben et al. 2016; Sloane et al. 2013; Terpenning & Shay 2002). With regard to the home care context, the maintenance of good oral health may delay an older person's transition to residential aged care.

However, from as early as 1975, national and international literature have consistently described the oral healthcare of older people as being one of the most missed and/or neglected aspects of care (Budtz-Jorgensen et al. 2000; Chalmers & Pearson 2005; Coleman 2002; El-Solh 2011; Kullberg et al. 2010; Miegel & Wachtel 2009; Terpenning 2005; Unfer et al. 2012; Wårdh & Sörensen 2005; Willumsen et al. 2012). Acknowledging that the majority of this research has taken place in residential care settings, commonly cited reasons for this neglect can be traced to the impact of negative misconceptions and attitudes that are perpetuated by systematic workplace practices and behaviours combined with inadequate oral healthcare knowledge and skills (Chalmers & Pearson 2005; Chami et

al. 2016; Coleman & Watson 2006; Bissett & Preshaw 2011; de Lugt-Lustig et al. 2013; de Visschere et al. 2015; Hoben et al. 2016; Janssens et al. 2016; Nitschke et al. 2010; Miegel & Wachtel 2009; Sjögren et al. 2008; Sloane et al. 2013; Terpenning & Shay 2002; Willumsen et al. 2012).

Widespread perceptions that the mouth is unimportant have given rise to the notion that oral healthcare is a low priority when compared to other aspects of care (Hopcraft et al. 2010; Frenkel et al. 2001; McNally et al. 2012; Sloane et al. 2013). This is expressed both implicitly and explicitly through the attitudes, behaviours and organisational work practices of aged care staff. For example, as previously mentioned, aged care staff, like older people and their families, tend to accept that poor oral health is a part of the normal ageing process (de Lugt-Lustig et al. 2013; Miegel & Wachtel 2009; Nitschke et al. 2010; Terpenning & Shay 2002). In addition, it is common for doctors and nurses to separate the mouth from the rest of the body, believing that care of the mouth is a matter for dentistry (Nitschke et al. 2010; Willumsen et al. 2012). Some aged care staff show a profound dislike or disgust for providing oral care; however, others share a perception that oral healthcare is intrusive to a person's dignity, and therefore display an unwillingness to intrude on an internal or private part of the body (Chami et al. 2016; Forsell et al. 2011a; Frenkel et al. 2001; McNally et al. 2012; Miegel & Wachtel 2009; Unfer et al. 2012; Willumsen et al. 2012). Similarly, it is very common for aged care staff to avoid carrying out oral healthcare on people with dementia (who may exhibit self-protective or care resistant behaviours) for fear of either being hurt themselves by being bitten or hurting the older person (Chalmers & Pearson 2005; de Lugt-Lustig et al. 2013; Forsell et al. 2011a; Jablonski et al. 2011; McNally et al. 2012; Willumsen et al. 2012).

Furthermore, oral healthcare neglect has been described as being perpetuated by systematic organisational attributes, such as rigid care routines and time-rationed workloads, as they force the delivery of care activities to be actioned according to their level of priority. Hence, as a non-pressing activity, oral healthcare can be easily omitted (Bissett & Preshaw 2011; Chami et al. 2016; Coker et al. 2016; de Visschere et al. 2015; Janssens et al. 2016; McNally et al. 2012; Sloane et al. 2013; Willumsen et al. 2012). Another issue raised is that unless an older person's mouth is particularly odorous or visibly causing pain, it can easily hide gaps in care (Thorne et al. 2001). Therefore, rather than valuing oral healthcare as a fundamental of care and recognising it as an important infection control mechanism, it has been rationalised as a secondary, low priority activity associated with grooming tasks such as shaving or hair styling (Chami et al. 2016; Coker et al. 2013). The failure of healthcare providers and/or families to provide essential oral healthcare equipment and resources (such as toothbrushes and toothpaste) is indicative of this, as is its absence in nursing care plans (Bissett & Preshaw 2011; Chami et al. 2016; Coleman & Watson 2006; Dharamsi et al. 2009; McNally et al. 2012; Miegel & Wachtel 2009; Willumsen et al. 2012). Alternatively, when oral healthcare is included in care planning

documentation, its implementation is typically neither enforced nor monitored (Chami et al. 2016; Coleman & Watson 2006; Miegel & Wachtel 2009; Terpenning & Shay 2002). Similarly, because the oral health criteria cited in the accreditation standards are generally of a nominal nature, this limits any motivation for staff to go beyond this (Terpenning & Shay 2002).

2.3.3 Oral health knowledge and skill gap

Numerous studies have demonstrated that because aged care staff have inadequate oral health knowledge and skills, they generally do not fully comprehend the high-risk consequences of poor oral health (Coleman 2002; de Visschere et al. 2015; Fitzpatrick 2000; Forsell et al. 2011b; Frenkel et al. 2001; Hopcraft et al. 2010; Knevel et al. 2016; McNally et al. 2012; Miegel & Wachtel 2009; Reed et al. 2006; Wårdh et al. 2002). Lack of knowledge is also an issue with regard to managing care-resistant behaviours and modifying oral healthcare approaches for older people with dementia (Chalmers & Pearson 2005; Coleman & Watson 2006; Hoben et al. 2016; Jablonski et al. 2011; Knevel et al. 2016). Variables such as levels of experience, knowledge and skills are factors known to influence the safety and quality of care provided (Willumsen et al. 2012). When it comes to oral healthcare, it is most often the primary responsibility of care workers who are unlicensed health workers with little or no formal training in oral healthcare (de Lugt-Lustig et al. 2013; Hoben et al. 2016; Janssens et al. 2016; Sloane et al. 2013). Changes in the oral health profiles of older people, including increased retention of teeth and the increased presence of complex fixed prosthetic appliances (crowns, bridges and or dental implants), impose a range of different and specific care needs that, in turn, require appropriate skills (Forsell et al. 2011a; Forsell et al. 2011b; Knevel et al. 2016; McNally et al. 2012; Sjögren et al. 2009). In other words, the goal of oral healthcare has evolved well beyond the notion of simply 'freshening' the mouth to one focused on proactive oral health maintenance (Coker et al. 2013; Wårdh et al. 2002).

Improving the oral health of older people through the education and training of care workers is a key recommendation of the World Health Organization (Petersen & Yamamoto 2005), with national and international literature describing numerous examples of one-off oral health education and training programs largely targeting the residential aged care workforce (Fallon et al. 2006; Forsell et al. 2011a; McNally et al. 2012; Miegel & Wachtel 2009; Nicol et al. 2005; Sjögren et al. 2008; Thorne et al. 2001; van der Putten et al. 2010; Wårdh & Sörensen 2005; Weening-Verbree et al. 2013; Zimmerman et al. 2014). While most have demonstrated small to moderate short-term improvements in oral healthcare, the long-term sustainability of these programs has been largely unsuccessful (Ástvaldsdóttir et al. 2018; Goodman et al. 2016; Villarosa et al. 2018). A major impediment to the effectiveness of oral health training programs has been the rapid turnover of staff in the aged care sector (Nicol et al. 2005; McNally et al. 2012). Likewise, the lack of oral health content in the curriculum of entry-level nursing courses and care worker training has been identified as a key systemic barrier for improvements in the oral

healthcare for older people, regardless of the healthcare context (Coker et al. 2013; Fitzpatrick 2000; Forsell et al. 2011a; Forsell et al. 2011b; Nicol et al. 2005; Sjögren et al. 2009; Unfer et al. 2012; Young et al. 2008).

More recent recommendations in the literature call for multi-level strategies to reverse the many factors that perpetuate oral healthcare neglect (de Lugt-Lustig et al. 2013; Dharamsi et al. 2009; Unfer et al. 2012; Weening-Verbree et al. 2013). This includes advocating for an enabling environment, a strong sense of organisational responsibility, well-defined reporting and accountability structures, and a genuine concern from aged care providers, managerial leaders, nurses and care workers to recognise the importance of oral health and ensure that provision of daily oral healthcare takes place (Dharamsi et al. 2009; Thorne et al. 2001). An understanding of the context and the target group, the identification of barriers to change, and the implementation of tailored strategies to overcome these barriers to oral healthcare have also been suggested (Weening-Verbree et al. 2013).

2.4 Better Oral Health in Home Care model

At Time 1, taking all the available evidence into consideration, the BOHHC model (Figure 3) was designed to support healthy ageing in the community setting through a home care team approach aimed at maintaining a client's oral health by operationalising four key oral health processes (oral health assessment, oral healthcare planning, daily oral care and referral for dental treatment) in routine home care practice. The development of the BOHHC model and accompanying learning and teaching package involved the input of home care providers, their staff and both Indigenous and non-Indigenous clients participating in the Building Better Oral Health Communities Project (2012–2014).

The BOHHC model recommends that at the commencement of home care support services, an older person should undergo an oral health assessment to detect the presence of dental need. The use of a validated six-question oral health assessment tool suitable for non-clinical care coordinators is recommended. Oral health assessment is followed by the development, in consultation with the client, of an oral healthcare plan designed to support the older person's oral healthcare needs (guided by six recommended categories of oral healthcare). Actioning this plan is the next step, with home care workers encouraging and supporting self-care or further assisting older people as determined by the care plan. Lastly, referral to a dental professional is made on the basis of the oral health assessment, with case management assistance recommended where needed.

Oral health assessment						
This may be performed by a general practitioner as part of an older person's medical assessment, or by a nurse or care coordinator on commencement of home care support, and subsequently at the client's annual review and as the need arises. The aim is to ensure that oral health is a recognised and practiced part of health assessment, and that appropriate care planning and dental referral are delivered when required.						
Six-question oral health assessment tool:						
<ol style="list-style-type: none"> 1. Do you have any of your own natural teeth? 2. Have you had pain in your mouth while chewing? 3. Have you lost any fillings, or do you need a dental visit for any other reason? 4. Have you avoided laughing or smiling because of problems with your teeth, mouth or dentures? 5. Have you had to interrupt meals because of problems with your teeth, mouth or dentures? 6. Have you had difficulty relaxing because of problems with your teeth, mouth or dentures? 						
Oral healthcare planning						
The care coordinator, in consultation with the client and/or the client's family, develops an oral healthcare plan based on the outcome of the oral health assessment and Better Oral Health in Home Care recommendations.						
Better Oral Health in Home Care:						
<table border="0"> <tr> <td>1. Care of natural teeth</td> <td>4. Tooth-friendly eating</td> </tr> <tr> <td>2. Care of dentures</td> <td>5. Seeing a dental professional</td> </tr> <tr> <td>3. Relief of dry mouth</td> <td>6. Quit smoking.</td> </tr> </table>	1. Care of natural teeth	4. Tooth-friendly eating	2. Care of dentures	5. Seeing a dental professional	3. Relief of dry mouth	6. Quit smoking.
1. Care of natural teeth	4. Tooth-friendly eating					
2. Care of dentures	5. Seeing a dental professional					
3. Relief of dry mouth	6. Quit smoking.					
Oral healthcare						
Home care workers encourage and support the client, and/or the client's family, to maintain daily oral care based on the oral healthcare plan. Home care workers report changes in a client's oral health to the care coordinator to ensure an appropriate reassessment is made.						
Dental referral and treatment						
Referral to a dental professional for a dental examination and treatment is made on the basis of the oral health assessment with the care coordinator and home care worker assisting the client, and/or the client's family, to attend their appointment.						

Figure 3: The Better Oral Health in Home Care model

Source: Lewis 2015, p.32.

2.4.1 Oral healthcare recommendations

The oral healthcare recommendations are based on a simple, preventive, evidence-based primary care approach relevant to the home care setting, recognising that good oral health relies on effective dental plaque removal, a tooth-friendly diet and adequate salivary flow (Bissett & Preshaw 2011). As summarised in Figure 4, these are classified as care of natural teeth, care of dentures, relief of dry mouth, tooth-friendly eating, seeing a dental professional and quit smoking advice.

Care of natural teeth
Encourage and support clients to: <ul style="list-style-type: none"> • brush their teeth, gums and tongue twice a day • use a soft toothbrush • use a pea-sized amount of fluoride toothpaste • spit but don't rinse after brushing • replace the toothbrush every three months.
Care of dentures
Encourage and support clients to: <ul style="list-style-type: none"> • brush dentures twice a day • use a denture brush with mild liquid soap and water or a denture paste to clean dentures, then rinse well • use a soft toothbrush to clean gums and tongue • put cleaned dentures in a container of fresh water overnight • to disinfect dentures, use a denture soaking tablet.
Relief of dry mouth
Encourage and support clients to: <ul style="list-style-type: none"> • keep their mouth moist by sipping plain tap water • limit sugary food and drinks, juice, tea, coffee and alcohol • avoid foods that are dry or salty or spicy • use a water-based lip moisturiser • ask a dental professional or pharmacist about dry mouth products.
Tooth-friendly eating
Encourage and support clients to: <ul style="list-style-type: none"> • enjoy a variety of tooth-friendly foods such as vegetables, fruit, plain milk, yoghurt and cheese • limit snacking and avoid the continual sipping of sugary drinks and sucking of sugary lollies • make it a habit to drink plain tap water to clean the mouth after meals, snacks, other drinks and medications.
Seeing a dental professional
Encourage and support clients to see a dental professional if the answer is 'yes' to any of these six questions about their natural teeth, mouth or dentures: <ol style="list-style-type: none"> 1. Do you have any of your own natural teeth? 2. Have you had pain in your mouth while chewing? 3. Have you lost any fillings, or do you need a dental visit for any other reason? 4. Have you avoided laughing or smiling because of problems with your teeth, mouth or dentures? 5. Have you had to interrupt meals because of problems with your teeth, mouth or dentures? 6. Have you had difficulty relaxing because of problems with your teeth, mouth or dentures?
Quit smoking
Encourage and support clients to: <ul style="list-style-type: none"> • quit smoking • talk to their doctor or pharmacist • call the QUITLINE on 13 7848 or visit www.quitnow.info.au

Figure 4: Oral healthcare recommendations

Source: adapted from Lewis 2015, pp.15–18.

Dental plaque is a naturally occurring and continuous clear substance that sticks to all surfaces of teeth and/or dentures and gums forming a sticky coating or biofilm (Bissett & Preshaw 2011; Coker et al. 2013). When food is eaten, bacteria in dental plaque convert sugars and starches into acid. This is called an acid attack, and when this takes place calcium from the tooth enamel escapes into the saliva and exposes the tooth to decay (Shay 2002). Fluoride is the principle chemical agent used to remineralise natural teeth as it combines with calcium in the saliva creating a surface that is resistant to decay (Chalmers & Pearson 2005). The easiest way to apply fluoride is by brushing teeth with a pea-sized amount of fluoride toothpaste twice a day combined with the practice of 'spit but don't rinse', as

this allows the fluoride to combine with calcium and reharden tooth enamel (Chalmers & Pearson 2005; National Oral Health Promotion Clearing House 2011). Similarly, the best way to remove and control dental plaque is by mechanical brushing. Brushing natural teeth, gums and tongue twice daily using a soft toothbrush is recommended as the most effective way to reduce the risk of tooth decay and gum disease and decrease the risk of aspiration pneumonia (Abe et al. 2008, Kuo et al. 2013; Marik & Kaplan 2003; National Oral Health Promotion Clearing House 2011; Shay 2002). As an infection control measure, toothbrushes should be replaced every three months (or with the change of seasons) (Chalmers & Pearson 2005).

Older people who wear dentures are at risk of fungal infections such as denture stomatitis. Oral infections can be caused by wearing dentures overnight, poor cleanliness of dentures, denture plaque, the permeability of acrylic denture resin, diet and pre-existing general health factors such as diabetes (Chalmers & Pearson 2005; Felton et al. 2011). Furthermore, a scratched denture can be a source of irritation and increase the risk of oral infections (Chalmers & Pearson 2005; Felton et al. 2011; Sumi et al. 2002). Based on the available evidence, mechanical brushing of dentures remains the best way to remove plaque (Felton et al. 2011). A denture brush is designed specifically to clean dentures, whereas a soft toothbrush should be used to clean any natural teeth present, gums and the tongue. Importantly, toothpastes used for natural teeth should not be used to clean dentures as they can be abrasive and scratch the denture over time. Therefore, dentures should be cleaned by brushing with a nonabrasive cleanser such as mild liquid soap or a denture paste and be thoroughly rinsed before being placed in the mouth (Chalmers & Pearson 2005; Felton et al. 2011). Dentures should not be worn continuously, and removing dentures overnight is a recommended way to rest gums. Cleaned dentures should be stored overnight in a container of fresh water (Felton et al. 2011). Although brushing is an effective way to remove plaque and debris from dentures, it does not disinfect dentures (Felton et al. 2011). Currently there is no clear evidence that any one denture disinfection method is superior to another (Felton et al. 2011). Denture soaking tablets are a popular and convenient method of disinfection, but the product must be suitable for the type of denture, and dentures must always be thoroughly rinsed before being placed in the mouth (Felton et al. 2011).

Given the understanding that dry mouth is a common problem that exacerbates poor oral health, it can be easily managed by keeping the mouth moist by frequent sipping of plain tap water, using water-based lip moisturisers and reducing the intake of caffeine-containing drinks. Limiting dry, salty or spicy foods also helps to relieve discomfort. Saliva flow can be stimulated by sugar-free lollies or, if appropriate, chewing gum (National Oral Health Promotion Clearing House 2011; Shay 2002). A dry mouth product best suited to the client can be recommended by a dental professional or pharmacist. Furthermore, because frequent snacking exposes teeth to continuous acid attack, it should be limited.

Tooth-friendly foods, including fresh fruit and vegetables and plain dairy products such as milk, yoghurt and cheese, are encouraged (National Oral Health Promotion Clearing House 2011). The drinking of plain tap water after meals, snacks, other drinks and medications is especially encouraged as it clears remaining food and rinses away acid from the mouth; fluoridated tap water is also a useful way of remineralising natural teeth (National Oral Health Promotion Clearing House 2011).

In addition, because the complexity of an older person's general health and oral health status puts them at increased risk of poor oral health, a routine oral health assessment and encouragement to see a dental professional supports the maintenance of good oral health (National Advisory Committee on Oral Health 2004; Slade et al. 2007). The recommended six-question oral assessment tool is an easy way to identify the presence of oral health problems. This assessment does not take the place of a comprehensive dental examination but is useful to assist non-dental health workers and for older people (and their families), to identify the need for a dental referral. This tool has been successfully tested in the community setting by allied health and home care staff (Lewis 2010; Slade 2007). The six oral health questions can be easily integrated into an existing general assessment process. A 'yes' to any of the questions triggers a dental referral (Slade 2007). An alternative clinical tool, called the oral health assessment tool, is recommended for clients who are unable to self-report and/or require a clinical assessment (Fricker & Lewis 2009). These oral health assessment tools have been incorporated into the Australian Government national standardised assessment undertaken by aged care assessment services (Sansoni et al. 2010).

Lastly, smoking is recognised as resulting in more disease than any other single risk factor. Many medical and oral conditions caused by smoking result in years of debilitating health issues. Smoking is a known cause of gum disease and oral cancers (Slade et al. 2007). Quitting smoking at any age has health benefits.

2.4.2 Learning and teaching package

The BOHHC model's accompanying learning and teaching package (inclusive of consumer resources) was developed during Time 1 and is freely available (SA Dental Service 2014). This package was designed to support home care workers. It is based on five learning activities: better oral healthcare, dementia and oral care, understanding the mouth, care of natural teeth and care of dentures. Each activity comes with a workbook that steps the learner through a series of learning outcomes through reading evidence-based information, watching an audiovisual resource and answering a reflective question worksheet (Figure 5). An accompanying facilitator guide (Figure 6) is provided to guide educators in the teaching of the Better Oral Health in Home Care content. Given the issues of rapid staff turnover, reduced home care worker training opportunities and calls in the literature to strengthen the oral health content of nursing and aged care courses, a parallel evaluation was undertaken as part of

this thesis to validate whether the BOHHC learning and teaching package was relevant to students undertaking an entry-level nursing or aged care qualification.


Better oral health in home care	Developed for home care workers
	<p>Part 1: Better oral healthcare</p> <ul style="list-style-type: none"> • What do you already know? (Quiz) • Good oral healthy is essential for healthy ageing • A healthy mouth will improve overall health and wellbeing • It takes a team approach • Good oral health begins at home • Dementia and oral care • Reporting oral health changes <p>Part 2: Promoting better oral healthcare</p> <ul style="list-style-type: none"> • Activity worksheets • What do you know? (Quiz).

Figure 5: Better Oral Health in Home Care worker resource

Source: SA Dental Service 2014.


Facilitator guide	Developed for educators
	<ul style="list-style-type: none"> • Overview • Facilitating adult learning • Facilitator presentation tips • Session Plan 1 <ul style="list-style-type: none"> ○ PowerPoint presentation with notes ○ Activity 1 Answers ○ Activity 2 Answers • Session Plan 2 <ul style="list-style-type: none"> ○ Activity 2 Answers ○ Activity 3 Answers ○ Activity 4 Answers.

Figure 6: Better Oral Health in Home Care facilitator guide

Source: SA Dental Service 2014.

Consumer resources were also produced to support staff with client oral healthcare education. These included two types of bathroom prompts (Figure 7) that serve as visual reminders: one is for the care of natural teeth and the other for the care of dentures. A self-care information resource (Figure 8) was produced to be given to older people at the commencement of home support or home care services. This was designed to increase the self-care awareness and raise the expectations of older people and their families regarding what constitutes good oral healthcare. A series of posters for displays and promotional activities were also made available (Figure 9).

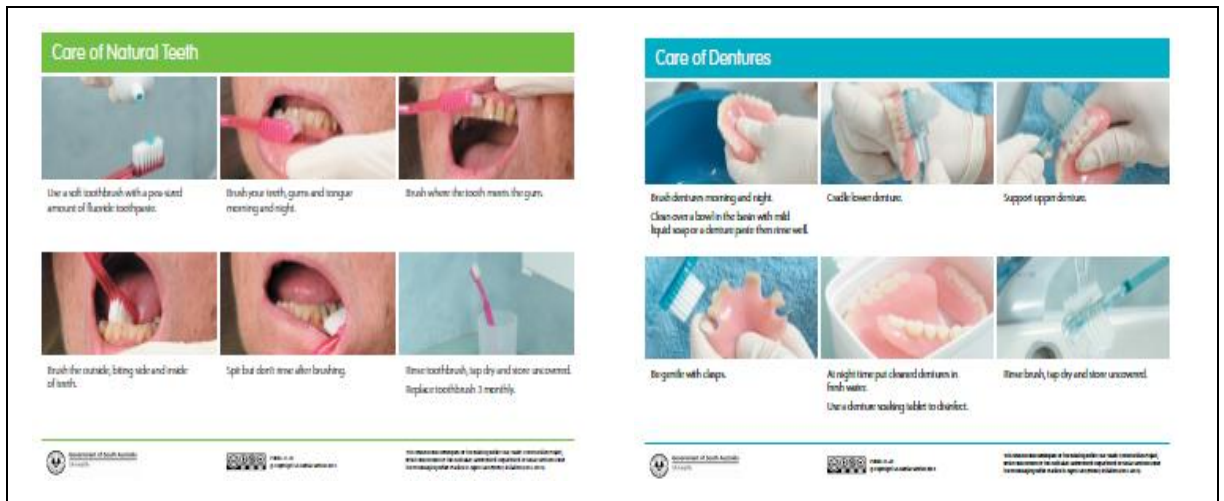


Figure 7: Bathroom prompts

Source: SA Dental Service 2014.

Good oral health and healthy ageing

Our mob need healthy mouths as we get older.

Key Messages:

- good oral health begins at home
- care of natural teeth
- care of dentures
- relief of dry mouth
- tooth-friendly eating
- seeing a dental professional
- quit smoking.

Government of South Australia SA Health | Building Better Oral Health Communities

Figure 8: Client oral health self-care information

Source: SA Dental Service 2014.

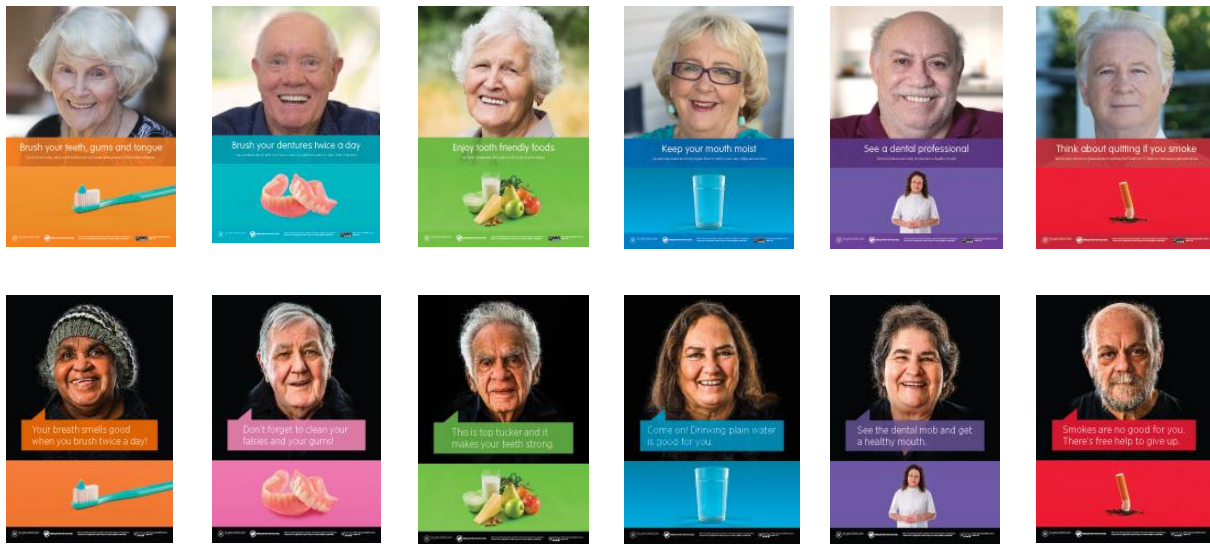


Figure 9: Promotional posters

Source: SA Dental Service 2014.

2.5 Conclusion

The synthesis of the literature and pertinent policy issues identifies the presence of multidimensional contextual factors influencing the home care setting, describing many stakeholders across micro, meso and macro levels of practice. It highlights that oral health is a poorly understood aspect of fundamental care, and that the knowledge and skills of the aged care workforce, and older people's self-care knowledge, need improvement. Importantly, the literature indicates that health care professionals, care workers and older people (and their families) have been conditioned to separate the mouth from the body, and to think that care of the mouth is less important than other aspects of care. Given the changing health and oral health profiles of the ageing population, the high-risk consequences of poor oral health and the increasing demand for community aged care services, this thesis proposes that a better understanding how multidimensional contextual factors support or hinder the implementation and sustainability of evidence-based oral healthcare interventions, such as the BOHHC model, in routine home care practice is warranted. The next chapter determines realism as the paradigm of choice with which to explore this complexity.

CHAPTER 3: REALISM AND COMPLEXITY

Realism was determined to be the most appropriate approach with which to explore the multidimensional contextual factors influencing the implementation and sustainability of the BOHHC model in routine home care practice. This chapter begins by comparing major philosophical worldviews as a means of critiquing the rationale behind selecting realism for this thesis. This is followed by an examination of realism's ontological, epistemological and methodological assumptions.

3.1 Rationale

A study's chosen paradigm describes the underlying beliefs about how knowledge claims about reality are made (Healy & Perry 2000; Wong 2014; Wynn & Williams 2012). The major philosophical worldviews are represented by the paradigms of positivism, critical theory, constructivism and realism. Each paradigm (Table 4) has its own chain of reasoning and rigour that follows a logical sequence of inquiry as defined by its ontology, epistemology and methodology (Lipscomb 2008; McEvoy & Richards 2006; Parlour & McCormack 2012; Schiller, 2016; Wilson & McCormack 2006; Wong 2014; Wynn & Williams 2012). Healthcare research, including that defined by government funding criteria, has in the past been dominated by hegemonic positivist approaches to knowledge production (Broom & Willis 2007). However, for the purposes of this thesis, it is proposed that a realist worldview is better suited to reconciling the contextual complexity of the home care setting with the objective of how to implement and sustain better oral healthcare for home care clients.

Table 5: Principal research paradigms and associated views

Assumptions	Paradigm			
	Positivism	Critical theory	Constructivism	Realism
Ontological	Science is able to discover the true nature of reality. There is a single apprehensible reality whose nature can be known and characterised.	Social realities are apprehensible based on historically situated structures. Focuses on the analysis and transformation of social, political, cultural, economic, ethnic and gender values.	Truth is subjective, based on the individual's perceptions of reality, resulting in a state of multiple realities.	Reality is apprehensible but can only be imperfectly and probabilistically comprehended.
Epistemological	The observer is separate from the research process. Findings are value-free and may be generalised to an entire population. Theory-free; findings true.	Interactive link between researcher and research object. Reality is based on perceptions held by a group of individuals.	Researcher and respondent create findings jointly. Researcher and research subject are mutually interactive.	Researcher is part of the research process but remains as objective as possible. Findings probably true.
Methodological	Experimental/manipulative: verification of hypotheses. Chiefly quantitative methods such as experiments and surveys.	Depends on the interpretative ability of the scholar who is a 'transformative intellectual'. Focus groups. Principally qualitative.	Depends on a researcher being a 'passionate participant' in the research process. Consensus; dialogues. Principally qualitative.	Depends on triangulating several perceptions of reality to capture a better picture of a phenomenon. Modified experimental/manipulative methods; case studies; interviews. Principally quantitative; may include qualitative techniques.

Source: adapted from Healy & Perry 2000, p. 119; Christie et al. 2000, p. 9; Wong 2014, p. 132.

3.1.1 Positivism

The core belief of positivism is that the world is a closed system that exists externally as a single reality or truth (Christie et al. 2000; Healy & Perry 2000; Williams et al. 2017; Wong 2014). Positivism is primarily considered to be a value-free, one-way mirror process between the phenomena and the researcher (Christie et al. 2000; Stiles 2003; Wong 2014). It uses a deductive approach of cause and effect involving quantitative methods such as controlled experiments and sample surveys to verify or negate theoretical hypotheses (Christie et al. 2000; Stiles 2003; Williams et al. 2017; Wong 2014). This means that the measurement and analysis of data are based on observable causal relationships between variables that are statistically generalisable as universal laws across time and context (Easton 2010; Stiles 2003; Trimarchi 1998; Wong 2014; Wynn & Williams 2012).

A key point is that closed systems can only exist under controlled circumstances. This is in direct contrast to the social world, which is deemed inherently open and uncontrollable, particularly with regard to the unique capacity of research participants to change and adapt to the circumstances they find themselves in (Dalkin et al. 2015; Trimarchi 1998; Zachariadis et al. 2013). Given that the context being explored by the thesis has an open system nature, a purely positivist approach is not suitable for this study because it would not be able to explain the uncontrollable and multidimensional factors that influenced the implementation and sustainability of BOHHC model in routine home care practice.

3.1.2 Critical theory

In contrast to the positivist paradigm, critical theory assumes an open system, and recognises the existence of multiple social realities (Healy & Perry 2000). Critical theory postulates that truth can only be known within a particular social group's constructed reality (Christie et al. 2000). The primary aim of critical theory is to instigate emancipatory transformational change by raising the consciousness of the research participants regarding oppressive and historically situated mental, emotional and social structures (Christie et al. 2000; Wong 2014). In contrast to the deductive methods of positivism, critical theory research uses inductive methods, often involving ethnographic and historical studies of organisational process and structures (Christie et al. 2000; Healy & Perry 2000). Assumptions in critical theory are therefore characteristically subjective, and the knowledge that is developed is grounded in social and historical customs that are value-dependent, not value-free as they are taken to be in positivism (Healy & Perry 2000). Although critical theory is better suited to the study of complex social phenomena than positivism, it was not the preferred choice for this thesis. A point of difference between critical theory and realism is that emancipation from oppression is not realism's key research objective (Babík 2013; DeForge & Shaw 2012; Lacouture et al. 2015). Recognising that there may well be elements of transformational change in this study, the main focus however, is on exploring the factors that influenced the processes of implementation and sustainability of the BOHHC model in routine home care practice.

3.1.3 Constructivism

Constructivism is another theoretical approach used to interpret complex social phenomena. Both critical theory and constructivism propose that there are multiple and subjective truths, as distinct from the singular and objective views of positivism (Wong 2014; Williams et al. 2017). Both approaches are interested in the meanings that lie behind the findings, and they use inductive methods to explore these (Christie et al. 2000). However, unlike critical theory's emancipatory intent, constructivism's main aim is to interpret the multiple realities of those involved in research within a defined context (Christie et al. 2000; Healy & Perry 2000; Wong 2014; Wynn & Williams 2012). Constructivists propose that rather than accepting one reality as a standard, there are many truths that all are equally valid, even though they

may be contradictory (Williams et al. 2017). Hence, this type of research closely relies on interactions between the researcher and research participants, as interpretation is dependent on narrative and discursive processes to build a consensus between the researcher and participants (Healy & Perry 2000; Williams et al. 2017; Wong 2014; Zachariadis et al. 2013). Although constructivism may be useful in understanding certain aspects of the community aged care context, it falls short of being able to achieve the level of in-depth understanding needed to be able to explain how contextual factors have supported or hindered the successful implementation and embedding of the BOHHC model in sustainable routine home care practice.

3.1.4 Realism

Realism neither rejects nor endorses the different worldviews offered by positivism, constructivism and critical theory. Rather, it proposes a different approach to reality by uniquely interpreting the world through mechanisms, events and experiences, employing the consideration of three domains of reality: the real, the actual and the empirical (Christie et al. 2000; Healy & Perry 2000; Stiles 2003; Trimarchi 1998; Williams et al. 2017, Wong 2014). Realist research aims to examine human behaviour, and to answer 'how' and 'why' questions regarding a particular issue, problem or intervention (Wong 2014). Realism achieves this by retrodution. Retrodution is a form of inferential reasoning that goes beyond the inductive and deductive approaches used in the other paradigms by verifying the existence of a set of mechanisms that are theorised to have generated the events being studied (McEvoy & Richards 2006; Miller & Tsang 2011; Musto & Rodney 2016; Williams et al. 2017). The realist researcher is neither removed from the research as the positivist is, nor are they embedded in the research like the constructivist, nor do they act as an emancipatory change agent as a critical theorist does (Wong 2014). Instead, the realist researcher remains as objective as possible through the research process with the aim of being value-aware rather than value-free or value-dependent (Wong 2014). Realism, therefore, offers this thesis a retroductive method of theory building with which to investigate the factors that influenced the implementation and sustainability of the BOHHC model, as compared with, the deductive methods of positivism and the inductive methods of critical theory and constructivism.

3.2 Realist paradigm

Realism has gained increasing acceptance in healthcare research because of its suitability for analysing the implementation of complex interventions in multidisciplinary social systems (Herepath et al. 2015). Viewed as a developing paradigm, realism has undergone several iterations as demonstrated by its various terminologies: naïve realism, transcendental realism, empirical realism, critical realism and social realism (Archer et al. 1998; Easton 2010; Harwood & Clark 2012; Healy & Perry 2000; Schiller 2016; Tremblay et al. 2014; Wand et al. 2010; Wong 2014; Wynn & Williams 2012). These iterations have largely been the result of differing views and philosophical debates concerning realist approaches

by various scholars (such as: Archer 1995; Bhaskar 1975; Pawson 1989, 2006; Pawson & Tilley 1997; Sayer 2000), thus indicating that any consensus regarding a unifying framework for realism is yet to be achieved (Easton 2010). In light of this, it has been suggested that dichotomies of ontology and epistemology do not necessarily involve dichotomies of method (Porter & O'Halloran 2012). Therefore, in this thesis, the seminal work of Bhaskar (1975) has been recognised as providing the philosophical platform for realism, while the contribution of Pawson and Tilley (1997) on Realist Evaluation has been acknowledged for its influence on advancing realist methodology. Accordingly, Realist Evaluation is discussed more fully in Chapter 5, as it contributes to the suite of theoretical frameworks and methodological approaches applied in this thesis.

As outlined in Figure 10, the following discussion provides a more detailed examination of realism's ontological, epistemological and methodological assumptions.

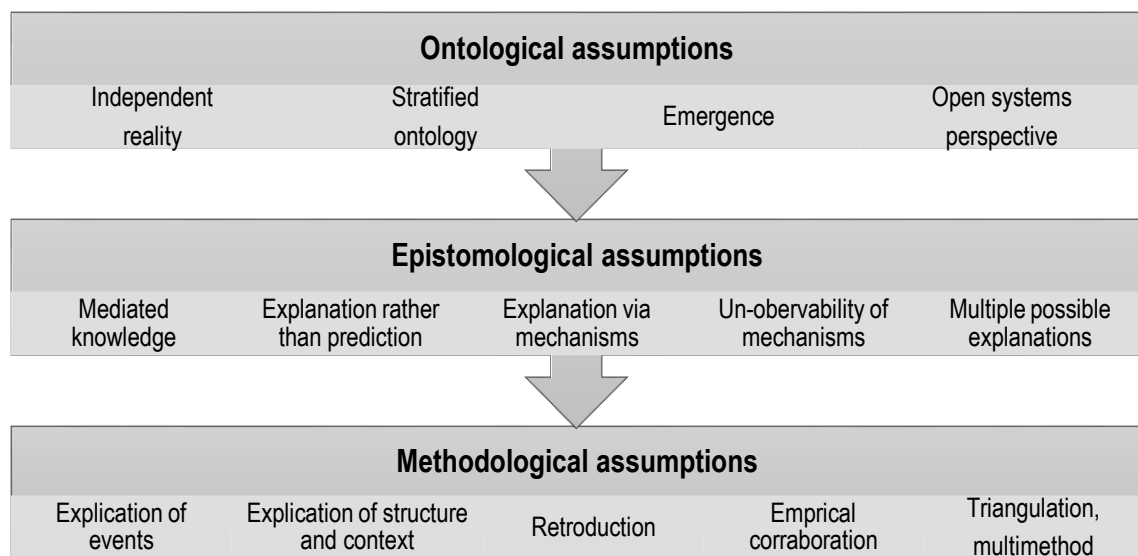


Figure 10: Ontological, epistemological and methodological assumptions of realism

Source: adapted from Wynn & Williams 2012, p. 797.

3.2.1 Ontological assumptions

Ontology refers to understandings of what defines the nature of reality (Healy & Perry 2000; Lipscomb 2008; McEvoy & Richards 2006; Schiller 2016; Wynn & Williams 2012). Realism is based on a uniquely stratified ontology that considers three domains as described in Figure 11. The real domain is where structures exist and interact independently of human understanding and experience (Harwood & Clark 2012; Lipscomb 2008; McEvoy & Richards 2006; Musto & Rodney 2016; Wand et al. 2010). The actual domain is a subset of the real domain and includes events that take place when a structure's causal powers or tendencies are enacted regardless of whether they are experienced or not (Harwood & Clark 2012; McEvoy & Richards 2006; Schiller 2016; Wand et al. 2010; Wynn & Williams 2012). The empirical domain is a subset of the actual domain and consists of those events that become known through the

direct and indirect experiences associated with the actual domain, which, in turn, are the outcome of the interplay of generative mechanisms in the real domain (Harwood & Clark 2012; McEvoy & Richards 2006; Miller & Tsang 2011; Schiller 2016; Wand et al. 2010; Wynn & Williams 2012).

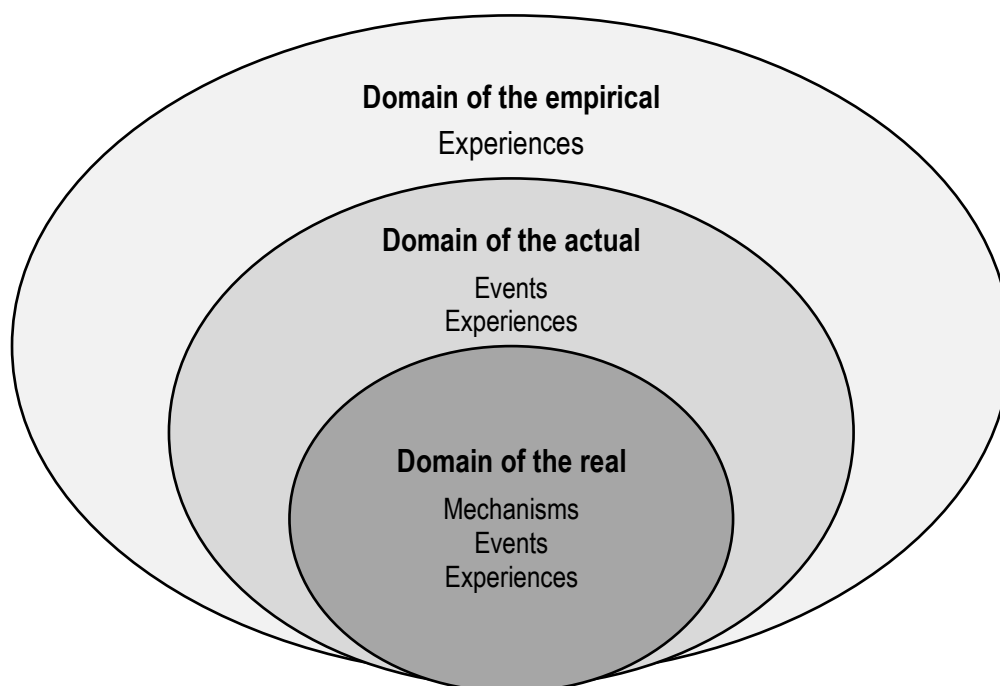


Figure 11: Stratified ontology of critical realism

Source: adapted from Archer et al. 1998, p. 41.

Realism defines structures as internally related objects that create entities within a given context (Wynn & Williams 2012). The resulting entities have inherent relationships specific to their structure. Context refers to any space or place where social and cultural interaction occurs (Williams et al. 2012).

Structures and their entities can be either social or physical, and possess causal powers or tendencies that may, or may not, produce outcomes in a given context (Harwood & Clark 2012; Schiller 2016; Wand et al. 2010; Wynn & Williams 2012). People are also recognised as entities of structures as their thoughts and beliefs have causal powers or tendencies (Astbury & Leeuw 2010; Wynn & Williams 2012). A structure's causal powers are believed to be responsible for the generation of outcomes (Harwood & Clark 2012; McEvoy & Richards 2006; Schiller 2016). A structure's potential for change is described as a tendency (Schiller 2016). A tendency also describes the characteristic actions of a given class, species or a type of event (Wynn & Williams 2012). The causal powers or tendencies of structures interact in ways that are highly context driven. This is particularly relevant for complex social situations involving multi-level stakeholders and social structures (Musto & Rodney 2016; Schiller 2016).

Realism uses the concept of a mechanism to explain the relationship between structures and their causal powers or tendencies. Mechanisms exist in the real domain, and can be social structures,

physical objects or technological artefacts (such as software). They represent the ways causal powers or tendencies act in given contexts to generate outcomes (Harwood & Clark 2012; Lipscomb 2008; Miller & Tsang 2011; Musto & Rodney 2016; Schiller 2016; Tremblay et al. 2014; Wong et al. 2012; Wynn & Williams 2012). Mechanisms may have micro, meso and macro level characteristics, and can display a number of social and political features (Astbury & Leeuw 2010; Miller & Tsang 2011; Schiller 2016). It follows that the precise location of power for change can vary. Causal mechanisms may sit within the structural component of the social world, such as the power that resides in the great societal institutional systems, or they may be identified at the level of individual reasoning (Dalkin et al. 2015). Therefore, mechanisms may have different meanings depending on the scope of the intended study.

A key distinguishing characteristic of a mechanism is that it is not directly visible or measurable and must be inferred from observable data. Mechanisms are also sensitive to variations in a given context, and to other mechanisms that are active in that context (Astbury & Leeuw 2010; Schiller 2016; Wand et al. 2010; Wong et al. 2012; Wynn & Williams 2012). A crucial distinction to make is that mechanisms are not interventions or activities; rather, they are the factors that make an intervention or activity work or not work (Astbury & Leeuw 2010; Williams et al. 2012). The outcome generated by a mechanism or mechanisms is referred to as an event; Miller & Tsang 2011; Wynn & Williams 2012). Events that can be directly observed are called experiences, and it is these experiences that are used to interpret reality (Wynn & Williams 2012).

3.2.2 Epistemological assumptions

Epistemology relates to the development of theories of knowledge that describe the nature of reality and how these claims are understood against existing knowledge (Lipscomb 2008; McEvoy & Richards 2006; Schiller 2016; Wynn & Williams 2012). The objective of realism is to produce knowledge through the development of conceptual models and theories in order to explain events and experiences observed in the empirical domain (Schiller 2016). Realism, therefore, attempts to use the knowledge of the experiences in a given context to inferentially analyse what the world must be like, in terms of structures and mechanisms, for an outcome to have occurred (Rycroft- Malone et al. 2012; Sobn & Perry 2006; Wynn & Williams 2012; Wong et al. 2012). It is in this way that realism uses the concept of emergence to explain the intended and unintended outcomes of mechanisms in the real domain.

Emergence is described as the relationship between two features when one arises from the other (Wand et al. 2010). Rather than considering causal associations to be universal, realism sees them as adaptive demi-regularities (or demi-regs) that are always strongly influenced by their context (Dalkin et al. 2015). A demi-regularity refers to any regularity in structures and events generated by mechanisms (Miller & Tsang 2011; Wynn & Williams 2012; Zachariadis et al. 2013). Demi-regularity patterns are considered to play a key role in the process of discovery by deepening the understanding of structures

and their mechanisms (Zachariadis et al. 2013). Therefore, rather than making predictions about future events or seeking to understand social and cultural meanings of events, the primary focus of realism is to explain a given event or set of events by uncovering the hypothesised existence of the mechanisms that could have produced them (1998; Handley et al. 2015; Musto & Rodney 2016; Wynn & Williams 2012).

Realism uses both transitive and intransitive knowledge (Wynn & Williams 2012; Zachariadis et al. 2013). Realism categorises mechanisms and structures as intransitive objects of knowledge because they exist and act independently of human minds but are still knowable through investigation (Schiller 2016; Zachariadis et al. 2013). This includes those elements that the researcher seeks to explain that are largely dependent on human experiences; Wynn & Williams 2012). In contrast, transitive knowledge is socially produced, and, therefore, mind-dependent (Schiller 2016; Zachariadis et al. 2013). Transitive knowledge development consists of the researcher's observations and theories about the independent world as developed through scientific investigation (Wynn & Williams 2012). Thus the combined use of transitive and intransitive knowledge in realism results in the identification of structures and mechanisms, and their interrelationships, in the form of theories for analysis (Wynn & Williams 2012). These explanations are referred to as middle-range theories as they focus on a set of specific phenomena, rather than being a grand theory that tries to explain phenomena at a societal level. In other words, the aim of realism is not to prove or disprove a particular middle-range theory, but to seek deeper levels of explanation that account for observed patterns in the data, and to accommodate, as far as possible, a range of possibilities that fit closely with and build on the current best understandings in the field (McEvoy & Richards 2006; Miller & Tsang 2011; Wong et al. 2012). Consequently, the resulting knowledge claims focus on theories that explain the generative mechanisms active in the real domain beneath what is observed in the empirical domain, and account for the contexts in the actual domain that influence what may and may not be experienced in the empirical domain (McEvoy & Richards 2006, Musto & Rodney 2016; Wand et al. 2010; Wynn & Williams 2012).

3.2.3 Methodological assumptions

Methodology represents the investigative process that gives structure to a paradigm's epistemological concepts by guiding the choice of methods used to identify, collect and analyse data (Lipscomb 2008; Schiller 2016; McEvoy & Richards 2006; Wong 2014). Realism's methodology is based on the reflective and iterative process of retrodution. Retrodution is used to build, test and refine the theory process in which multiple explanations are proposed to describe the mechanisms that must exist within a social structure in order to produce the observed events (Easton 2010; Kitson et al. 2011; Tremblay et al. 2014; Wand et al. 2010; Williams et al. 2017; Wynn & Williams 2012). Given that a single methodological approach might constrain retroductive knowledge development, realist methodology

encourages the use of a mixed method design to explore what works for whom, how, why and in what circumstances (Miller & Tsang 2011; Stiles 2003; Wand et al. 2010). It is proposed that the successful blending of methods results in findings that mutually inform and support each approach, creating enhanced design logic, implementation and reporting (Wand et al. 2010). Realism also advocates that the choice of various methods should be dictated by the nature of the research, and in many cases the most effective approach is to use a variety of qualitative and quantitative techniques (McEvoy & Richards 2006; Schiller 2016; Wand et al. 2010; Wynn & Williams 2012). An example of this is the mixed method case study approach, which is commonly recognised as an appropriate method when 'how' and 'why' research questions are posed, especially when the focus is on in-depth exploration and explanation of complex phenomena within a real-life context (Easton 2010; Wong 2014; Yin 2009).

3.3 Conclusion

Realism was determined as the philosophical approach for this thesis following a process of critical analysis examining how the major philosophical worldviews influence the development of theoretical and methodological approaches used to identify, collect and analyse data. It was concluded that realism provides the most appropriate approach with which to understand the multidimensional factors involved in the community aged care context by interpreting the meaning of this complexity through mechanisms, events and experiences by considering three domains of reality: the real, the actual and the empirical. The next chapter shows how the three interrelated elements of inquiry presented in this thesis brought together the current developments regarding implementation science and sustainability with the philosophical assumptions of realism to better understand the factors that influenced the implementation and sustainability of the BOHHC model in routine home care practice.

CHAPTER 4: IMPLEMENTATION SCIENCE AND SUSTAINABILITY

The aim of this chapter is to provide insight into the rapidly evolving science of implementation and sustainability, and its endeavour to reconcile knowledge translation with complexity. Implementation science aligns well with the philosophical assumptions of realism as this field of research repeatedly highlights the complexity of implementation, and frames its research to incorporate questions about what, why, how and through whom evidence-based knowledge finds its way into healthcare policy and practice (Contandriopoulos 2012; Kitson & Harvey 2016; Rapport et al. 2018). The chapter investigates the developing theoretical frameworks and methodological approaches associated with implementation and sustainability.

4.1 Implementation science

Implementation science is defined as the scientific study of methods that promote the systematic uptake of research findings and other evidence-based interventions (EBIs) in routine practice with the aim of improving the quality and effectiveness of healthcare (Eccles & Mittman 2006). EBIs represent specific actions or sets of actions (programs, practices, principles, procedures, pills and policies) that health delivery systems enact to improve health behaviours, health outcomes and/or health-related environments (Leeman et al. 2017; Rapport et al. 2018). Since implementation science is acknowledged as an emerging field of research, many of its theories, models and frameworks, and its common terminology, are still evolving (Bauer et al. 2015; Rapport et al. 2018). For example, the terms implementation science and knowledge translation (KT) are often used interchangeably to mean the same thing. KT was defined at a consensus meeting of the World Health Organization in 2005 as 'the synthesis, exchange and application of knowledge by relevant stakeholders to accelerate the global and local innovation in strengthening health systems and advancing people's health' (Greenhalgh & Wieringa 2011, p. 502). In other words, implementation science and KT are recognised as taking place in complex, multidisciplinary healthcare systems in which interactions are dependent on a set of social processes that include sensing and interpreting new evidence, integrating it with existing evidence, reinforcement or not by health workers or health professional networks, which, in turn, are influenced by the local context including the contribution of the patient (client or consumer) or the general public (Greenhalgh & Wieringa 2011; Rycroft-Malone et al. 2011).

As shown in Figure 12, the effective implementation of EBIs is frequently attributed to a continuum of five foundational theoretical concepts: diffusion, dissemination, implementation, adoption and sustainability (Rapport et al. 2018). These components have traditionally been described as constituting either a predictive pipeline approach or, as demonstrated in Figure 12, a cyclical feedback loop progressing through the action of each phase of the continuum. Diffusion is defined as the passive,

untargeted and unplanned spread of new practices over time through informal and formal communication channels (Nilsen 2015; Rapport et al. 2018). Dissemination, on the other hand, is regarded as the active spread of EBIs to a targeted audience via determined channels and planned strategies (Nilsen 2015; Rapport et al. 2018). Implementation is referred to as both an ideal and an endeavour. As an ideal it captures research evidence and applies it to practice. As an endeavour, implementation represents a planned process of integrating the new practices into a targeted healthcare setting (Nilsen 2015; Rapport et al. 2018). Adoption refers to the degree of uptake of new ideas, behaviours, practices and organisational structures. It is considered to be particularly dependent on the nature of the context in which the implementation is taking place (Rapport et al. 2018). Contextual factors include the current practices and attitudes of those working within a particular organisation, the experiences of those managing the organisational design and activity, and the organisational structure and processes. Other factors include material resources, staff skills-set, and the policies, incentives, networks and linkages that affect how knowledge is used by staff adopting the new EBIs (Rapport et al. 2018). Lastly, sustainability is recognised as the logical endpoint of implementation, and is achieved when an EBI's new knowledge has been applied and embedded.

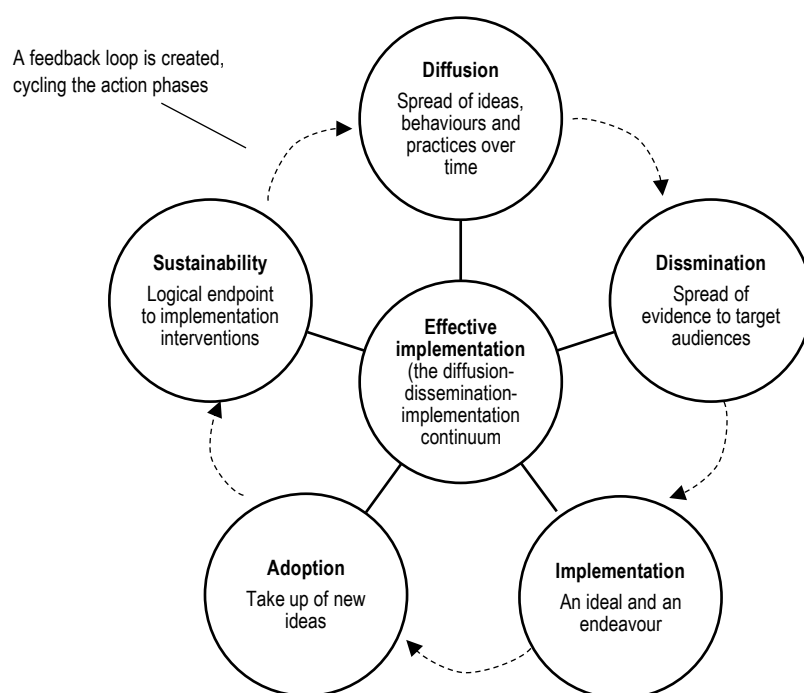


Figure 12: Foundational concepts of implementation

Source: Rapport et al. 2018, p. 119.

In terms of scientific development, theory in implementation science usually implies a predictive capacity and attempts to explain the causal mechanisms of implementation (Nilsen 2015). Implementation science commonly uses models to describe and/or guide the process of translating research into practice, rather than attempting to predict or analyse the factors that influence implementation outcomes

(Nilsen 2015). Frameworks in implementation science often serve a descriptive purpose, and are used to identify factors believed or found to influence implementation outcomes (Nilsen 2015). For example, Figure 13 describes how theories, models and frameworks can be used to support the successful dissemination and implementation of EBIs, and to clarify what influences the research outcomes, as well as evaluating the success of the intervention (Rapport et al. 2018).

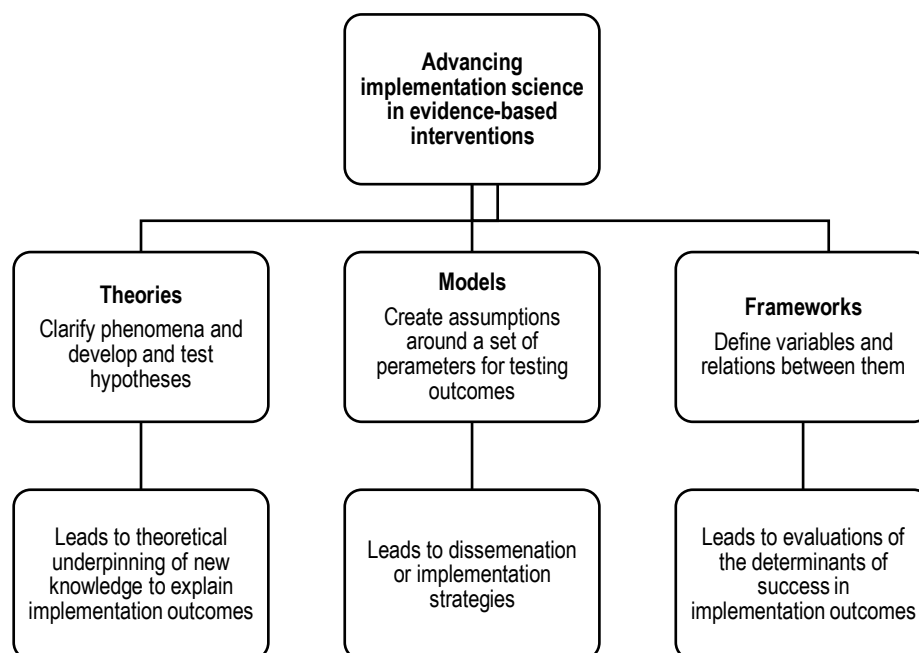


Figure 13: Theories, frameworks and models: supporting successful dissemination and implementable study outcomes

Source: adapted from Rapport et al. 2018, p. 120.

Similarly, as shown in Figure 14, theoretical approaches in implementation science have three overarching aims. One is to describe and/or guide the process of translating research into practice. Two is to understand and/or explain what influences implementation outcomes. Three is to evaluate implementation (Nilsen 2015). These aims are underpinned by five theoretical categories consisting of process models, determinant frameworks, classical theories, implementation theories and evaluation frameworks. Process models are used to describe and/or guide the process of translating research into practice (Nilsen 2015). Determinant frameworks describe general types (classes, concepts or domains) of determinates that are hypothesised or have been found to influence implementation outcomes (Nilsen 2015). Classical theories are theories that originate from fields outside of implementation science, which can be applied to provide understanding and/or an explanation of aspects of implementation (Nilsen 2015). Implementation theories, on the other hand, refer to theories that have been developed by implementation researchers to provide understanding and/or explanation of aspects of implementation (Nilsen 2015). Lastly, evaluation frameworks provide structure for evaluation of implementation. Potential evaluation outcomes include: acceptability, adoption or uptake,

appropriateness, costs, feasibility, fidelity, integration and sustainability (Nilsen 2015). Although separate frameworks can be used, it is suggested that implementation theories, models and frameworks can also be applied for evaluation purposes because they generally specify concepts and constructs that can be measured (Nilsen 2015).

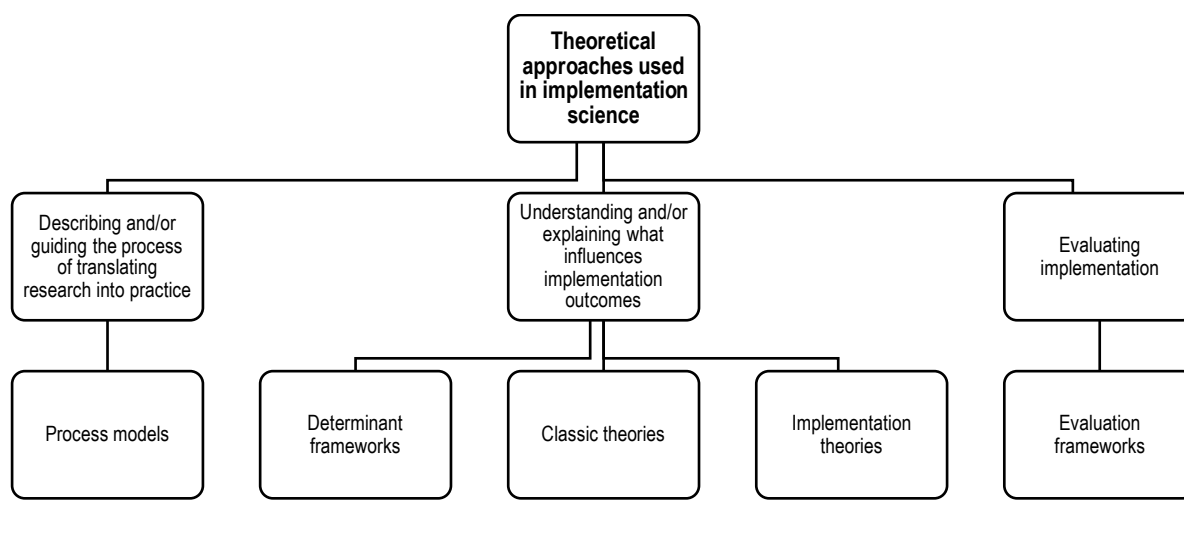


Figure 14: Three aims of the use of theoretical approaches in implementation science and the five categories of theories, models and frameworks

Source: Nilsen 2015, p. 4.

Other developments in implementation science relate to the classification of implementation strategies as a way to better support the alignment of strategies with relevant theoretical approaches, and to provide a clearer synthesis of findings across implementation studies (Leeman et al. 2017; Powell et al. 2015). The classification of implementation strategies ranges from the compilation of numerous discrete implementation strategies, as described by the Expert Recommendations for Implementing Change Project (Powell et al. 2015), to the description of five conceptually distinct classes of strategies: dissemination, implementation process, integration, capacity building and scale-up strategies (Leeman et al. 2017). This approach of conceptually classifying implementation strategies is further enhanced by the description of systems that enact these strategies across micro, meso and macro levels of practice. Based on the interactive system framework for implementation, they include delivery systems, support systems, and synthesis and translation systems, as depicted in Figure 15 (Leeman et al. 2017). Delivery systems refer to the individuals who adopt and integrate the EBI in their practice setting (Leeman et al. 2017). Support systems represent individuals who promote and support EBI adoption and implementation with a focus on building capacity to adopt and implement the EBI. They may function within the delivery system or be external to the setting offering support and coaching (Leeman et al. 2017). Synthesis and translation systems, on the other hand, consist of external research organisations (such as the Cochrane Collaboration and Joanna Briggs Institute) that synthesise, translate and widely

disseminate EBIs in print and electronic formats (Leeman et al. 2017). Alternatively, another set of strategies for maintaining health professional behavioural change have been identified through the use of systematic reviews undertaken by the Cochrane Effective Practice and Organisation of Care Review Group, as described in Table 6.

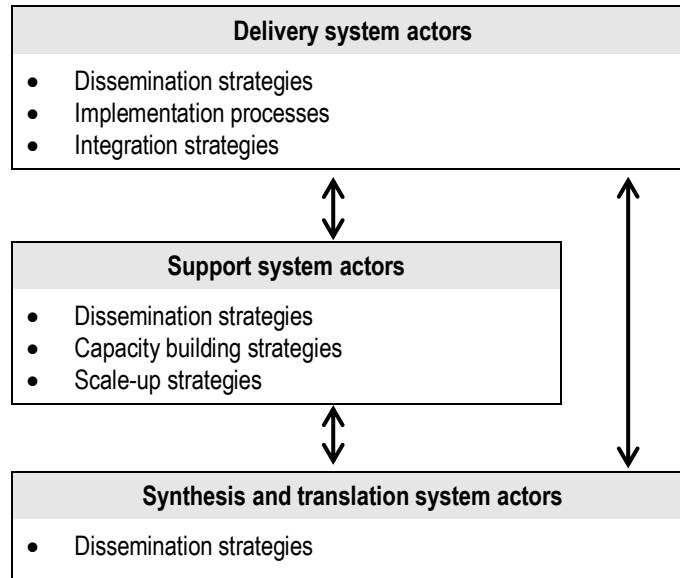


Figure 15: Classes of implementation strategies organise within the Interactive System Framework.

The bi-directional arrows represent the importance of communication across levels.

Source: Leeman et al. 2017, p. 4.

Table 6: Professional interventions as per the Cochrane Effective Practice and Organisation of Care Review Group

Name	Description
Distribution of educational materials	Distribution of published or printed recommendation for clinical care, including clinical practice guidelines, audiovisual materials and electronic publications. The materials may have been delivered personally or through mass mailings.
Educational meetings	Healthcare providers who have participated in conferences, lectures, workshops or traineeships.
Local consensus processes	Inclusion of participating providers in discussion to ensure that they agreed that the chosen clinical problem was important, and the approach to managing the problem was appropriate.
Educational outreach visits	Use of a trained person who met with providers in their practice settings to give information with the intent of changing the provider's practice. The information given may have included feedback on the performance of the provider(s).
Local opinion leaders	The use of providers nominated by their colleagues as 'educationally influential'. The investigators must have explicitly stated that their colleagues identified the opinion leaders.
Patient-mediated interventions	New clinical information (not previously available) collected directly from patients and given to the provider; for example, depression scores from an instrument.
Audit and feedback	Any summary of clinical performance of healthcare over a specified period of time. The summary may include recommendations for clinical action. The information may be obtained from medical records, databases or patient observations.
Reminders	The patient or provider encounters specific information designed or intended to prompt the health professional to recall information or perform or avoid some action to aid individual care. Computer aided decision support is included.
Marketing	Use of personal interviewing, group discussion (focus groups) or a survey of targeted providers to identify barriers to change and subsequent design of an intervention that addresses identified barriers.
Mass media	Either (1) varied use of communication that reached great numbers of people, including television, radio, newspapers, posters, leaflets and booklets, alone or in conjunction with other interventions; or (2) targeted.

Source: adapted from Johnson & May 2015, p. 2.

Facilitation is also emerging as an important concept in the uptake of EBIs and is viewed as a means of strengthening KT by bridging the gap between evidence and practice (Berta et al. 2015). What is evident in the recent literature is that facilitation involves both a specific role and a process (Berta et al. 2015; Harvey & Kitson 2015). Although the literature notes that there is a need for more research to better understand how facilitation relates to evidence about implementation, the seminal work of Kitson, Harvey and McCormack (1998) on the development of the Promoting Action on Research Implementation in Health Services framework, and the work of Harvey and colleagues (2002) concerning the conceptual analysis of the purpose, roles, skills and attributes of a facilitator, is frequently referred to in the implementation science literature (Berta et al. 2015).

A recent challenge to conventional thinking about how KT has been conceptualised within implementation science has come from Kitson and colleagues (2017). Presented as the KT complexity network model, this work draws on the classical theories of complexity and networks, conceptualising KT as a multidimensional, dynamic, complex and integrated process. This approach represents a dramatic shift away from thinking of KT as a logical, predictable pipeline or cyclical process. Rather, it suggests that KT is dependent on the decisions and actions of individuals or teams who can connect in,

across and between multiple networks to achieve the outcome of the new knowledge becoming accepted (Kitson et al. 2017, p. 4). Central to the KT complexity network model are five sectors: research, education, health, government and community (including industry). Each sector is referred to as complex adaptive system (CAS). A CAS is defined as a collection of diverse parts interconnected such that an organisation grows over time without centralised control (Kitson et al. 2017, p. 5). The inherent adaptive behavioural dynamics of each CAS, in turn, influences KT efforts, notwithstanding that the primary purpose of each CAS is not likely to be KT (Kitson et al. 2017). Implicit in this, therefore, is the need to generate greater synergy and collaboration among the five sectors (Kitson et al. 2017). Within each sector are cluster networks that incorporate five key areas of process (problem identification, knowledge creation, knowledge synthesis, implementation and evaluation) that function dynamically (Kitson et al. 2017). In other words, the KT complexity network model proposes that the five sectors provide the structure and systems to create, mobilise, teach and fund KT, and the five interdependent clusters represent the key areas of process required to produce an integrated KT approach (Kitson et al. 2017).

4.2 Sustainability

Although sustainability is recognised as the logical endpoint of the implementation process, it is poorly defined in the literature, with no agreed-upon definition and few theories or models to guide its practice (Dombrowski et al. 2016; Scheirer 2013; Wiltsey Stirman et al. 2012). Generally, the literature refers to the seminal work of Shediac-Rizkallah and Bones (1998) and Scheirer (2005), who conceptualised sustainability in healthcare as consisting of three levels of operational outcomes: individual, organisational and community (Wiltsey Stirman et al. 2012). Individual outcomes refer to the continued benefits for clients after the initial program funding ends, or following the initial implementation of a new program, intervention and/or procedure (Scheirer 2005, 2013). Organisational outcomes, often called institutionalisation or routinisation, are the continuation of the program activities (Scheirer 2005, 2013). Community outcomes represent the continued capacity to deliver program activities following the initial program's capacity-developing processes (Scheirer 2005, 2013). Implicit in this is the understanding that, like implementation, sustainability is influenced by multidimensional factors such as the nature of the context (policies and legislation, culture and structure), the nature of the evidence or innovation (its fit, adaptability and effectiveness), processes (fidelity monitoring, evaluation, efforts to align the intervention with the context), as well as the capacity to sustain (funding resources, workforce characteristics and stability, interpersonal processes) (Wiltsey Stirman et al. 2012, p. 9). Therefore, although successful implementation is an important achievement, this does not necessarily guarantee sustainability. A recommended final step in the life cycle of any healthcare project is the assessment of its sustainability two or more years after implementation (Wiltsey Stirman et al. 2012).

4.3 Conclusion

Many of the theories, models and frameworks of implementation science and sustainability are still evolving; however, their alignment with the philosophical assumptions of realism in seeking to reconcile KT with complexity make them fit well with the research aims of this thesis to better understand the factors that have influenced the implementation and sustainability of the BOHHC model in routine home care practice. The next chapter examines the theoretical frameworks and methodological approaches that have been applied in the three interrelated elements of inquiry undertaken in this thesis.

CHAPTER 5: METHODOLOGY

Realist methodology encourages the use of a mixed method case study design to explore what works for whom, how, why and in what circumstances (Miller & Tsang 2010; Stiles 2003; Wand et al. 2010). It also promotes the use of both qualitative and quantitative techniques, advocating that the choice of methods should be dictated by the nature of the research (McEvoy & Richards 2006; Schiller 2016; Wand et al. 2010; Wynn & Williams 2012). The aim of this chapter, therefore, is to examine the suite of theoretical frameworks and methodological approaches applied in this thesis, as summarised in Table 7. The Promoting Action on Research Implementation in Health Services framework, Normalisation Process Theory, Realist Evaluation and the Kirkpatrick model for learning and training evaluation were chosen as a blended approach with which to explore the complexity of the multidimensional factors that influenced the implementation and sustainability of the BOHHC model in routine home care practice.

The Promoting Action on Research Implementation in Health Services framework was specifically selected because it provides an interesting determinant approach (Nilsen 2015) that uses facilitation to help understand and/or explain how the interactions associated with the introduction of evidence-based oral healthcare and the characteristics of the home care context influenced the BOHHC model implementation outcomes. This approach embraces a range of eclectic theories that acknowledge human agency and individual choice, behavioural change and social action, and organisational change. With regard to better understanding how staff have embedded (or not) the BOHHC model in routine home care practice, Normalisation Process Theory was chosen because of its focus on social action coupled with its growing popularity in the literature as a way of explaining how sustainability takes place in healthcare (Dombrowski et al. 2016; Nilsen 2015). Realist Evaluation, on the other hand, was purposely applied as an explicit realist evaluation method (Pawson & Tilley 1997) to explain how multidimensional contextual factors have influenced staff's capacity to embed and sustain better oral healthcare in the home care context. Finally, in the interests of improving the oral health content of nursing and aged care courses, the Kirkpatrick model was selected to assess the relevance of the BOHHC learning and teaching package (designed to support the implementation of the BOHHC model) for students undertaking an entry-level nursing and/or aged care qualification. While the Kirkpatrick model differs from the other methodologies in that it has a predominantly underlying positivist approach, its inclusion was largely predicated on its popularity as a recommended standard for learning and training across a variety of training communities such as business, government, military and industry (Alliger & Jank 1989; Bates 2004; Beech & Leather 2006; O'Malley et al. 2013; Rouse 2011; Salas & Cannon-Bowers 2001; Watkins et al. 1998). In recent years, the Kirkpatrick model has been widely applied across the healthcare sector (Anderson et al. 2016; Barr et al. 1999; Gordon & Findley 2011;

Hammick et al. 2007; Haller et al. 2008; Mowry & Gabel 2015; O'Malley et al. 2013; Smidt et al. 2009; Söderlund et al. 2011).

Table 7: Summary of the study design and methods

Publication 1	Publication 2	Publication 3
<p>Title 'Improving oral health for older people in the home care setting: An exploratory implementation study'</p>	<p>Title 'Evaluating student learning outcomes in oral health knowledge and skills'</p>	<p>Title 'Can oral healthcare for older people be embedded into routine community aged care practice? A Realist Evaluation using Normalisation Process Theory'</p>
<p>Aim Study aimed to explore how home care providers can support older people to maintain good oral health through appropriate assessment, care plan development, service delivery and referral to dental care by:</p> <ul style="list-style-type: none"> • using the Promoting Action on Research Implementation in Health Services framework to optimise transfer of the model of oral health care used in residential aged care to suit the home care context • describing older people's levels of oral health improvement following implementation of this model. 	<p>Aim Study aimed to evaluate the relevance of the BOHHC learning and teaching package for three different student groups that were yet to enter the aged care workforce.</p> <p>These groups included: students undertaking a Bachelor of Nursing in order to become registered nurses; students undertaking a Diploma of Nursing in order to become enrolled nurses; and students undertaking a Certificate III in Aged Care in order to become aged care workers.</p> <p>Using the Kirkpatrick model of learning and training, the objectives were to evaluate whether:</p> <ul style="list-style-type: none"> • students found the resources relevant to their learning needs • resources increased the oral health knowledge and skills of students • educators teaching these students found the resources to be relevant to the teaching of oral health as one of the fundamentals of care. 	<p>Aim Study aimed to undertake a Realist Evaluation exploring the embedding of sustainable oral healthcare for older people in routine home care practice by:</p> <ul style="list-style-type: none"> • reviewing how the BOHHC model was designed to work • using the Normalisation Process Theory core constructs as a framework with which to investigate how the BOHHC model had or had not been operationalised as intended by comparing two timeframes: Time 1 and Time 2 • determining what mechanisms helped or hindered its use • explaining what contextual characteristics supported or undermined its use via their influence on the key mechanisms • describing the possible outcomes for home care clients resulting from the interaction between the identified mechanism and contextual characteristics.
<p>Design The Promoting Action on Research Implementation in Health Services framework informed the implementation of the BOHHC within a case study of four home care provider sites (involving three different aged care organisations) delivering a range of home care and home support services to non-Indigenous and Indigenous clients situated in metropolitan, regional and country locations in South Australia and New South Wales.</p>	<p>Design Kirkpatrick's training and evaluation model was used to evaluate the BOHHC learning and teaching package within a case study of one university and one large government vocational education provider, both located in South Australia.</p>	<p>Design A Realist Evaluation applying Normalisation Process Theory within a case study of one home care provider organisation (involving two sub-cases: metropolitan and country sites) delivering home care and home care support services to mainly non-Indigenous clients in South Australia.</p>

<p>Method A mixed method, pre- and post-implementation study.</p> <p>Data were collected from older people who undertook an oral health assessment and completed pre- and post-intervention questionnaires on oral hygiene and dental treatment. Home care staff completed pre- and post-intervention questionnaires on oral health knowledge and a questionnaire on the oral health learning and teaching package.</p> <p>Quantitative data were analysed using descriptive and inferential statistics. Qualitative analytical methods were used for process analysis.</p>	<p>Method Data were collected from students who used the resources as prescribed study materials and completed pre- and post-intervention questionnaires specifically designed for this study.</p> <p>Educators were interviewed to obtain their feedback.</p> <p>Quantitative data were analysed using descriptive and inferential statistics. Qualitative data were thematically analysed according to relevance to learning, presentation style and interest.</p>	<p>Method Qualitative methods were applied in two subcases, reflecting different contextual settings.</p> <p>Data were collected via semi-structured interviews and analysed deductively by applying the Normalisation Process Theory core constructs (with the recommended phases of the realist evaluation cycle).</p> <p>Retrospective and prospective analytical methods were used to investigate how the intervention was operationalised by comparing two timeframes: Time 1 and Time 2.</p>
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5.1 Promoting Action on Research Implementation in Health Services

The Promoting Action on Research Implementation in Health Services (PARIHS) framework is used in this thesis to guide the implementation of the BOHHC model in the community aged care context. PARIHS was first published in 1998 by Kitson, Harvey and McCormack as a conceptual framework to guide the successful implementation of EBIs in the healthcare setting (Kitson et al. 1998). This approach grew out of the health quality improvement movement and has been widely used across a variety of healthcare topics and settings, while at the same time undergoing an iterative process of continual development, testing and refinement (Kitson & Harvey 2016).

The PARIHS framework conceptualises that three instrumental variables (evidence, context and facilitation) are required for successful implementation. Evidence is defined as the EBI being implemented, and includes sub-elements such as the nature of the evidence, its relevance to the health workplace, clinical or patient experience and local knowledge (Kitson et al. 1998). Context refers to the environment or setting in which the evidence is being implemented, and includes its receptiveness to change, its culture, leadership and evaluation processes (Kitson et al. 1998). Facilitation refers to both the role and process of influencing the context in which change is taking place, and includes supporting healthcare staff to make sense of the evidence being implemented. This process involves tailoring implementation strategies according to the evidence to be implemented and identifying factors in the context that may hinder or support implementation (Kitson et al. 1998). In summary (Figure 16), the PARIHS framework proposes that successful implementation is represented as a function of the nature and the type of evidence, the qualities of the context in which the evidence is being introduced and the way the process is facilitated (Kitson et al. 1998).

$$SI = f(E, C, F)$$

- SI = Successful implementation
- f = Function (of)
- E = Evidence
- C = Context
- F = Facilitation

Figure 16: Successful implementation according to PARIHS framework

Source: Harvey & Kitson 2015, p. 41.

The reported limitations of the PARIHS framework concern issues regarding the need for greater conceptual clarity in terms of definitions describing and operationalising the elements and sub-elements of ‘evidence’ and ‘context’ (Helfrich et al. 2010; Stetler et al. 2011). It has also been suggested that the term ‘successful implementation’ requires a fuller explanation, as does the meaning of motivation for change (or the recognised need for change) and the attributes concerning critical innovation. The need for more information and practical guidance has also been raised about the element of ‘facilitation’ in terms of facilitator attributes and the task of developing change strategies including more information about common types of interventions (Helfrich et al. 2010; Stetler et al. 2011). Other issues involve the need for instrumental tools to identify barriers and facilitators, as well as the need to further develop approaches in how to evaluate successful implementation. Similarly, there has been a call for more evaluation regarding the framework’s use (Helfrich et al. 2010; Stetler et al. 2011).

In response to this type of feedback, a revision of the PARIHS framework by Harvey and Kitson (2015) took place during the timeframe of this thesis. Called the integrated PARIHS (i-PARIHS) framework, the core elements of evidence, context and facilitation were refined to represent the innovation to be implemented, taking into consideration the intended recipients of the innovation, the internal and external context in which implementation is to take place, and the facilitation approach that is required to implement the framework (Harvey & Kitson 2015). The i-PARIHS framework (Figure 17) therefore proposes that successful implementation is based on a number of levels that reflect the multidimensional focus on the innovation, the recipients and the context, with facilitation identified as the active element assessing, aligning and integrating the other three constructs (Harvey & Kitson 2015).

The i-PARIHS framework purposely widens the concept of evidence to that of innovation, and in doing so extends thinking about how knowledge is generated and transferred within and among organisations. This change recognises the role of both explicit and tacit knowledge in informing decision-making and practice at clinical and organisational levels, and includes understanding what may enhance or inhibit the uptake of new knowledge (Harvey & Kitson 2015). Innovation, therefore, has an explicit focus on investigating and applying available research evidence to inform the innovation (Harvey & Kitson 2015). The revised framework also recognises that recipients influence the processes and outcomes of implementation at both individual and team levels. This brings into focus the role that individual leaders

play in supporting or resisting innovation, and acknowledges the importance of working through teams, being aware of the boundaries that can exist between groups or teams and the potential barriers that these present during implementation (Harvey & Kitson 2015). Furthermore, the role of context is made more explicit by acknowledging the presence of an inner and outer context. The inner context includes the immediate setting of the implementation and the organisation in which it is located. The outer context refers to the wider healthcare system in which the organisation is based, and the policies, regulatory frameworks and political environment that govern how the healthcare system works. Each of these levels of context are conceptualised in terms of micro, meso and macro dimensions (Harvey & Kitson 2015).

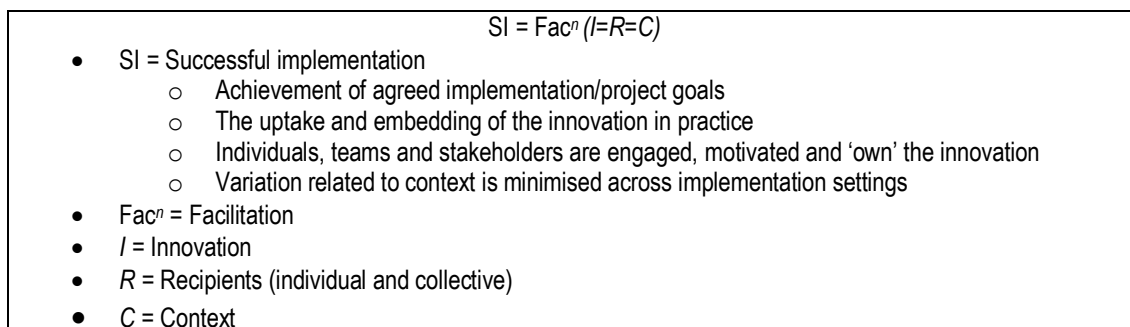


Figure 17: Successful implementation i-PARIHS framework

Source: Harvey & Kitson 2015, p. 41.

Although facilitation remains an essential construct, the i-PARIHS framework places a much stronger emphasis on its role as the active ingredient and positions it differently in relation to the constructs of innovation, recipients and context (Harvey & Kitson 2015). Rather than seeing facilitation as one of three interplaying constructs that determine the outcomes of implementation, it is conceptualised as the linchpin that enables meaningful participation and ownership of recipient actions, which leads to purposeful and collective action that activates implementation and change (Harvey & Kitson 2015). Subsequently, this means recognising both the facilitation process and the role of the facilitator as essential variables in guiding implementation (Harvey & Kitson 2015). Three distinctive facilitator roles are also identified: the novice facilitator, the experienced facilitator and the expert facilitator (Kitson & Harvey 2016). The presence and interaction of all three roles not only builds facilitation capacity but strengthens the action of facilitation. For example, a novice facilitator may be someone from within the organisation, such as a manager or clinician who has previously been involved in a small improvement or research project, or who has demonstrated a set of interpersonal and interactive skills that prepare them to become effective KT facilitators (Kitson & Harvey 2016). The presence of an experienced facilitator acts as a support for the novice facilitator, and is a role usually played by staff who have previously worked as novice facilitators. Previous experience as a facilitator enables them to take on larger, organisation-wide projects. Facilitators at this level also monitor and assess wider system

activities, and ensure local initiatives are protected so they can be embedded in routine practice. The experienced facilitator develops skills related to developing capacity and sustaining change (Kitson & Harvey 2016). These include knowing how to embed new evidence or ideas in routine practices. Studies have shown that this ability to embed new evidence in an existing policy, procedure or task within the clinical setting means the innovation is more likely to be accepted and the changes sustained (Wiechula et al. 2009). The involvement of an expert facilitator, on the other hand, offers a mentoring role and process that guides both novice and experienced facilitators to develop their understanding of how wider contextual factors influence successful implementation. The expert facilitator has the knowledge and skills-set needed to be able to manage competing tensions around innovations, to be confident in dealing with individual motivation and productivity in more complex circumstances and be able to develop and extend the range of techniques employed to keep teams on task and working productively together to implement the new evidence or innovation (Kitson & Harvey 2016, p. 298). The expert facilitator role may be located in academia with strong links to practice, or alternatively can be based in a healthcare organisation with links to an academic institution.

5.2 Normalisation Process Theory

Normalisation Process Theory (NPT) is used in this thesis as a mid-range theory to explain how home care staff have embedded (or not) the BOHHC model in routine home care practice. As described in Table 8, NPT is referred to as a social action theory that uses four reciprocal core constructs (coherence, cognitive participation, collective action and reflexive monitoring) to describe the processes by which interventions become embedded (or not) in routine healthcare (May et al. 2007; May et al. 2009; Johnson & May 2015). Coherence or sense-making refers to what staff, either individually or collectively, do when faced with operationalising a new intervention in routine practice. This involves staff understanding the aims and benefits of the new intervention, how it is supposed to work and their roles and responsibilities (May et al. 2007; May et al. 2009). Cognitive participation or engagement refers to the work that defines and organises staff to build and maintain a practice network around a new intervention (May et al. 2007; May et al. 2009). This includes whether key staff members have continued to facilitate the new intervention so that staff remain engaged and support the actions and procedures needed to sustain it as an embedded practice (May et al. 2007; May et al. 2009). Collective action refers to the work that staff do to operationalise the new intervention in everyday routines. This includes staff feeling accountable and confident in themselves and each other as they use the new intervention. This is underpinned by the nature of the staff skills-set and includes managing the new practice using various resources, protocols, policies and procedures (May et al. 2007; May et al. 2009). Lastly, reflexive monitoring refers to the appraisal work that staff use to define and manage the information needed to evaluate the outcomes of operationalising the new intervention (May et al. 2007;

May et al. 2009). This includes systematically collecting information by formal and/or individual appraisal such as regular auditing and risk management processes.

Table 8: NPT core constructs

Construct	Construct subsets	Description
Coherence	Differentiation	An important element of sense-making is to understand how a set of practices and their objects are different from each other.
	Communal specification	Sense-making relies on people working together to build a shared understanding of the aims, objectives and expected benefits of a set of practices.
	Individual specification	Sense-making has an individual component too. Here participants in coherence work need to do things that will help them to understand their specific task and responsibilities regarding a set of practices.
	Internalisation	Finally, sense-making involves people in work that is about understanding the value, benefits and importance of a set of practices.
Cognitive participation	Initiation	When a set of practices is new or modified, a core problem is whether or not key participants are working to drive the practices forward.
	Enrolment	Participants may need to be organised or to reorganise themselves and others in order to collectively contribute to the work involved in the new practice.
	Legitimation	An important component of relational work around participation is the work of ensuring that other participants believe it is right for them to be involved, and that they can make a valid contribution to it.
	Activation	Once it is underway, participants need to collectively define the actions and procedures needed to sustain the practice and to stay involved.
Collective action	Interactional workability	This refers to interactional work that people do with one another, with artefacts, and with other elements of a set of practices when they seek to operationalise interventions in everyday settings.
	Relational integration	This refers to the knowledge work that people do to build accountability and maintain confidence in a set of practices and in each other as they use them.
	Skill-set workability	This refers to the allocation work that underpins the division of labour that is built up around a set of practices as they are operationalised in the real world.
	Contextual integration	This refers to the resource work of managing a set of practices through the allocation of different kinds of resources and the execution of protocols, policies and procedures.
Reflexive monitoring	Systemisation	Participants in a new set of practices may seek to determine how effective and useful the practices are for themselves and for others. This involves the work of collecting information in a variety of ways.
	Communal appraisal	Participants work together. Sometimes in formal collaboratives, sometimes in informal groups, to evaluate the worth of a set of practices.
	Individual appraisal	Participants in a new set of practices also work experientially as individuals to appraise the effects of practices on themselves and on the contexts in which they are set. From this work stems actions through which individuals express their personal relationships with new technologies or complex interventions.
	Reconfiguration	Appraisal work by individuals or groups may lead to attempts to redefine procedures or modify practices, and even to change the shape of the new technology itself.

Source: adapted from Johnson & May 2015, p. 3.

In relation to understanding behaviour change maintenance, NPT is classified as a theory that recognises the importance of a supportive environment, positive social influences and constructive social change (Kwasnicka et al. 2016). NPT describes social change as a three-stage process involving implementing, embedding and sustaining change. This highlights the ability to integrate practices into the healthcare context as key to maintaining staff behaviour (Kwasnicka et al. 2016). This concurs with a recent theory-led overview of systematic reviews by Johnson and May (2015) who have examined the types of interventional strategies (persuasive, educational and/or information, action and monitoring)

most likely to produce sustained change in staff behaviour. Strategies focused on action, supported by educational input (such as audit, feedback, reminders, educational outreach), were found to be effective ways of maintaining staff behaviour (Johnson & May 2015). In other words, these approaches are considered useful because they contribute to the normative restructuring of practice, relational restructuring (with a focus on collective rather than individual action), modifying of peer group norms and expectations, and the continued reinforcement of these modified peer group norms (Johnson & May 2015). In relation to NPT, the strategies most likely to sustain successful change in staff behaviour are those that act through the constructs of collective action and reflexive monitoring (Johnson & May 2015). This supports the view that sustained behaviour change largely follows alterations in structure and action, rather than it being the outcome of changes in the beliefs or intentions of individual staff members (Kwasnicka et al. 2016).

The reported challenges of using NPT mainly relate to the practical application of the NPT constructs. In addition, concerns have been raised about the potential overlap between the constructs including difficulties in assigning data which can often be closely interrelated to another category within NPT (McEvoy et al. 2014). This also involves overcoming difficulties with using the predetermined NPT conceptual framework and the problem of fitting data into the predetermined categories; including the issue of what to do with data that falls outside the NPT coding framework (McEvoy et al. 2014). Another concern raised relates to the tendency for researchers to limit NPT to a single stake-holder perspective, rather than, using NPT to provide a whole-system analysis (McEvoy et al. 2014).

5.3 Realist Evaluation

Realist Evaluation (RE) is applied with NPT in this thesis to further understand how the NPT core constructs might support the embedding of the BOHHC in sustainable routine practice. RE is explicitly based on realism, and has been used in a wide range of healthcare evaluations including individual healthcare interventions aimed at patient/practitioner behaviour, local-level changes to healthcare delivery and large-scale programs of health service change (Cheyne et al. 2013; Handley et al. 2015; Herepath et al. 2015; Rycroft-Malone et al. 2012; Sullivan et al. 2002; Williams et al. 2012).

Based on the seminal work of Pawson and Tilley (1997), RE provides a systematic theory-based investigative structure: context-mechanism-outcome configurations, abbreviated to CMOs (Astbury & Leeuw 2010; Cheyne et al. 2013; Linsley et al. 2015; Kitson et al. 2011; Pawson & Manzano-Santaella 2012; Pawson & Tilley 1997; Porter & O'Halloran 2012; Tremblay et al. 2014; Wand et al. 2010; Wong et al. 2012). Implicit in RE is the understanding that 'it is not so much the intervention or program or innovation that is responsible for causing change to take place but rather it is the people, embedded in their contexts, who and when exposed to the intervention or program, do something to activate given mechanisms and cause change' (Stame 2004, cited in Williams et al. 2017, p. 6). In other words, RE

attempts to identify and understand a recipient's different responses to different resources offered within interventions or programs (themselves considered to represent complex social structures) and, in doing so, understand the complicated layers that exist below that which can be observed at the surface to explain the reasoning behind recipients' responses. It is this feature of RE that enables the process of learning about what works, and allows the researcher to consider how findings can be applied to different programs and inform future healthcare policy and practice (Herepath et al. 2015; Williams et al. 2017).

The key methodological principles of RE involve an evaluation cycle (Figure 18) similar to that of a traditional cycle of hypothesis generation, testing and refinement using empirical observation to inform unconditional generalisations (Salter & Kothari 2014; Wand et al. 2010). RE begins with the theorising of possible CMOs about the mechanisms most likely to be active in the program or intervention being studied (Kitson et al. 2011; Lacouture et al. 2015; Pawson & Tilley 1997; Rycroft-Malone et al. 2012; Tremblay et al. 2014; Williams et al. 2017). This approach places an emphasis on the importance of making explicit the logic of the intervention and to clearly distinguish it from the logic of the intervention implementation (Lacouture et al. 2015).

Referred to as the program theory, CMOs serve as a framework with which to build explanations that go beyond determining whether or not an intervention is effective. Rather, CMOs are used to explain how and why an intervention is effective, under what circumstances/conditions and for which group of patients or clients (Astbury & Leeuw 2010; Cheyne et al. 2013; Dalkin et al. 2015; Handley et al. 2015; Kitson et al. 2011; Linsley et al. 2015; Pawson & Tilley 1997; Porter & O'Halloran 2012; Tremblay et al. 2014; Williams et al. 2012). Essentially, CMOs represent the hypothesis that the program outcome (O) emerges because of the action of some underlying mechanism (M) which comes into operation only in a particular context (C) (Herepath et al. 2015; Pawson & Manzano-Santaella 2012; Salter & Kothari 2014). Fundamental to CMOs is the interdependence or necessary relationship between context and mechanism. Changes occur when interventions combined with the right contextual factors release generative mechanisms. Each CMO therefore explains and progressively redefines the scope of the original program theory, with a focus on understanding the refined and/or alternative program theory that sits behind the intervention (Williams et al. 2017).

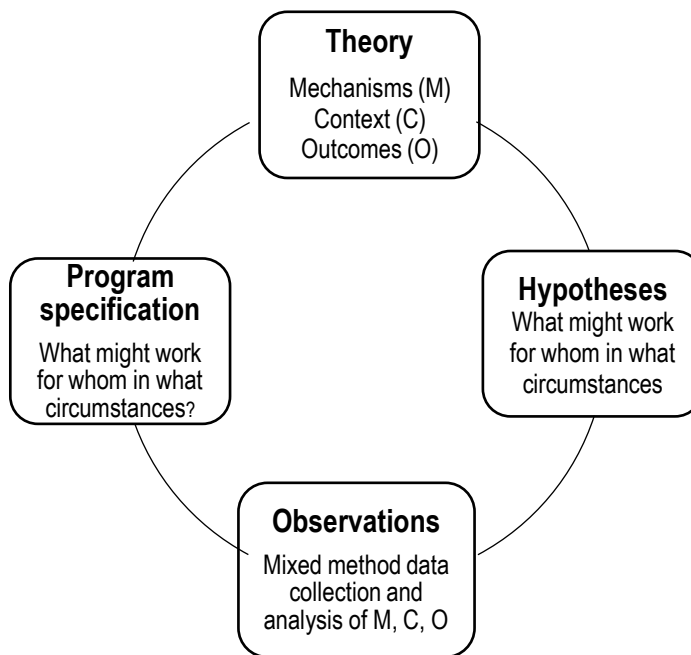


Figure 18: Realist evaluation cycle

Source: Pawson & Tilley 1997, p. 85

An intervention is therefore treated as a separate analytical category, and specifically refers to strategies and implemented activities. Mechanisms, in contrast, focus on the elements of individual or collective reasoning or reactions to the intervention implementation (Herepath et al. 2015; Lacouture et al. 2015). In other words, interventions act as opportunities that people can choose to take in a given context to bring about an outcome; whereas mechanisms are seen as the causal process that produces an effect (Herepath et al. 2015; Lacouture et al. 2015). Rather than generalising through statistical inference from a particular sample to a broader population, the aim of RE is to provide detailed explanations of the mechanisms at work in a given context in order to gain insights into how and why similar mechanisms could lead to different, or similar, outcomes in a different context (Wynn & Williams 2012). By refining the CMOs at different levels of abstraction, RE contributes to both specification and generalisation, revealing the conditions under which programs are successful (Wand et al. 2010). Although this does not give definitive answers about whether certain programs or interventions work, it does provide an explanatory account of the how, when and why an intervention works or does not work (Wand et al. 2010). The benefits of RE are, therefore, the potential for transferrable lessons about how certain contexts are more or less likely to produce particular outcomes. This understanding makes it possible to target more effective implementation strategies required to optimise structures, and to activate the best mechanisms to achieve the desired program or intervention outcomes (Cheyne et al. 2013; Handley et al. 2015; Linsley et al. 2015; Tremblay et al. 2014; Williams et al. 2012).

With regard to limitations, Pawson and Tilley (2004) acknowledge important shortcomings in RE in that it is intellectually challenging and requires substantial expertise in advanced theoretical understanding, methodological abilities in research design, and technologies for data analysis (Pawson & Tilley 2004). Similarly, RE is recognised as resource intensive and time consuming (Marchal et al. 2012; Westthorp et al. 2011). Other reported limitations in using RE concern a lack of clarity of when theory-led research should be used, as well as a lack of practical methods with which to guide researchers in how to develop a program theory (Marchal et al. 2012). Difficulties in defining context, including distinguishing between mechanisms and context, have also been cited as ongoing issues with using RE, as is, the feasibility of undertaking multiple cycles of data collection and analysis to fully refine a theory by exploring all of the plausible CMO configurations (Marchal et al. 2012).

5.4 Kirkpatrick model

The Kirkpatrick model is used in this thesis to assess the relevance of the BOHHC learning and teaching package (designed to support the implementation of the BOHHC model) for students undertaking an entry-level nursing and/or aged care qualification. Introduced in 1959, the Kirkpatrick model of training and learning evaluation (Kirkpatrick & Kirkpatrick 1994) offers health professionals a basic evaluation model for identifying and targeting quality improvement training efforts (Alliger & Jank 1989; Watkins et al. 1998). Although there have been several attempts to revise and adapt the Kirkpatrick model, the original framework remains in common use (Rouse 2011; Watkins et al. 1998). Its popularity lies in its simplicity and its systematic focus on outcomes (Aylward et al. 2003; Barr et al. 1999; Bates 2004; Hammick et al. 2007; Mowry & Gabel 2015; Rouse 2011; Salas & Cannon-Bowers; Smidt et al. 2009). The original model (Figure 19) identifies four levels at which training or educational innovations can be evaluated: the learner's reaction, learning, behaviour and results stemming from the learning opportunity (Bates 2004; Haller et al. 2008; Hammick et al. 2007; Kirkpatrick & Kirkpatrick 1994; O'Malley et al. 2013; Rouse 2011; Salas & Cannon-Bowers 2001; Smidt et al. 2009; Watkins et al. 1998).

Level 1	Reaction	Learner satisfaction
Level 2	Learning	Learning outcomes (knowledge and skills)
Level 3	Behaviour	Performance improvement (transfer of learning to workplace)
Level 4	Results	Patient or healthcare outcomes

Figure 19: Kirkpatrick model

Source: adapted from Curran & Fleet 2005, p. 563; Sargent et al. 2011, p. 169.

Level 1 refers to the participants' reaction to the training (Barr et al. 1999; Bates 2004; Beech & Leather 2006; Curran & Fleet 2005). This level is used to gauge the interest, motivation and attention levels of participants (Smidt et al. 2009), and is measured as satisfaction with specific components of the training, such as learning objectives, content, presentation style and audiovisual materials (Curran &

Fleet 2005). Level 2 involves measuring whether learning has taken place in terms of participants' knowledge, understanding and/or skills (Barr et al. 1999; Bates 2004; Beech & Leather 2006; Curran & Fleet 2005; Smidt et al. 2009). Level 3 refers to training knowledge transfer in terms of changes in behaviours and performance (Barr et al. 1999; Bates 2004; Beech & Leather 2006; Curran & Fleet 2005; Smidt et al. 2009). It addresses the extent to which knowledge and skills gained in the training have been applied in practice. And finally, Level 4 describes the results of the training, and relates to measuring the outcomes in terms of system-wide or organisational impact, such as improvements in healthcare and patient outcomes (Barr et al. 1999; Bates 2004; O'Malley et al. 2013; Rouse 2011). In some cases, a model modification may be present as an additional fifth level. Described as return on investment, the Kirkpatrick model has a financial focus on measuring whether the training investment provided positive financial returns (Bates 2004).

Despite the continuing popularity of the Kirkpatrick model, a major shortcoming concerns its inadequate consideration of contextual complexities (Bates 2004). For example, the outcomes of Levels 3 and 4 evaluation occur over time and are the most challenging because they are influenced by a range of multidimensional factors (such as context, related workplace characteristics and culture) other than training (Aylward et al. 2003; Beech & Leather 2006; Curran & Fleet 2005; Hammick et al. 2007; Smidt et al. 2009). Coupled with this, is an assumption that the model implies the existence of a simple causal relationship between the levels of evaluation, however, little evidence has been established confirming either substantial correlations between measures at different outcome levels or linear causality (Alliger & Jank 1989; Bates 2004; Reio et al. 2017). Furthermore, when the model is adopted in short-term studies, there is a tendency for trainers to limit training evaluation to one particular level, with level 2 evaluation the most popular. Other deficiencies identified include a lack of consideration for formative and process evaluation (Bates 2004; Reio et al. 2017). The model also fails to specify what assessment techniques should be used to measure learning to account for factors that may affect outcomes of each level of evaluation (Reio et al. 2017). Likewise, in terms of levels 3 and 4 evaluation, there has been a call for the development of cost-efficient methods and theoretically sound frameworks (Aryadoust 2017).

5.5 Conclusion

By critically acknowledging the strengths and limitations of adopting the PARIHS framework, NPT, RE and the Kirkpatrick model, this thesis has been able to uniquely blend a range of theoretical frameworks and methodological approaches that mutually inform and complement each other, thus enhancing the design logic of the mixed method case study approach. The PARIHS framework proposes that successful implementation is represented as a function of the nature and the type of evidence, the qualities of the context in which the evidence is being introduced, and the way the process is facilitated. NPT provides a framework of core constructs (coherence, cognitive participation, collective action and

reflexive monitoring) with which to describe the processes by which interventions become embedded (or fail to become embedded) in routine healthcare delivery. RE takes this investigation further by providing a deeper explanation of the interrelationships between the NPT core constructs and the multidimensional contextual factors associated with the home care context, using CMOs to explain the mediating effect of context on the implementation and sustainability of the BOHHC model in routine home care practice. The Kirkpatrick model, on the other hand, was used to gauge the responses of students undertaking an entry-level nursing and/or aged care qualification to the BOHHC learning and teaching package in terms of levels of satisfaction and learning outcomes. Examination of the application of these theoretical frameworks and methodological approaches to the three interrelated elements of inquiry studied in this thesis, takes place in the following chapters. This is reported in the three publications presented and provides additional information on the participant recruitment processes, data collection methods, data analyses and study outcomes. Further discussion concerning the methodological limitations of this thesis occurs in the final chapter, Chapter 9.

CHAPTER 6: PUBLICATION 1

Lewis, A, Kitson, A & Harvey, G 2016, 'Improving oral health for older people in the home care setting: An exploratory implementation study', *Australasian Journal on Ageing*, vol. 35, no.4, pp. 273–280, DOI:10.1111/ajag.12326.

This first publication uses the PARIHS framework to guide the initial implementation of the BOHHC model in the home care practice, referred to as Time 1. During this time, the candidate played a key role as an experienced external facilitator in supporting home care project staff (novice facilitators), as well as facilitating the processes of implementation. At pre-implementation, older people were found to have high levels of dental need, with home care clients reporting significant improvements in their oral health following implementation of the BOHHC model. From a home care provider perspective, the BOHHC model was found to provide community-based prevention and early detection of oral health problems for home care clients; linking well with Home Care Standards' quality improvement and referral obligations. Process analysis identified multi-level facilitation as instrumental to the successful development and implementation of tailored strategies that were highly suitable to the home care context. This included organisational engagement; the integration of the BOHHC model processes into aged care provider documentation; the use of an assessment tool easily understood by non-clinical care coordinators; oral health reporting guidelines for care workers; and a freely available learning and teaching package designed to meet the needs of home care staff (including consumer resources to support client education). Home care workers self-reported significantly improved oral health knowledge and skills following their training and were highly positive about the learning and teaching package.

Statement of Authorship

Title of Paper	Improving oral health for older people in the home care setting: An exploratory implementation study
Publication Status	<input checked="" type="checkbox"/> Published <input type="checkbox"/> Accepted for Publication <input type="checkbox"/> Submitted for Publication <input type="checkbox"/> Unpublished and Unsubmitted work written in manuscript style
Publication Details	Lewis, A., Kitson, A., & Harvey, G. (2016) Improving oral health for older people in the home care setting, An exploratory implementation study. <i>Australasian Journal on Ageing</i> , 35, 273-280. doi: 10.1111/ajag.12326

Principal Author

Name of Principal Author (Candidate)	Adrienne Lewis		
Contribution to the Paper	Performed analysis and interpreted qualitative data, wrote manuscript and acted as corresponding author.		
Overall percentage (%)	70%		
Certification:	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper.		
Signature		Date	30.10.2017

Co-Author Contributions

By signing the Statement of Authorship, each author certifies that:

- i. the candidate's stated contribution to the publication is accurate (as detailed above);
- ii. permission is granted for the candidate to include the publication in the thesis; and
- iii. the sum of all co-author contributions is equal to 100% less the candidate's stated contribution.

Name of Co-Author	Prof Alison Kitson		
Contribution to the Paper	Supervised development of work, assisted with data interpretation and manuscript evaluation. Permission granted for this paper to be included in this thesis.		
Signature		Date	30.10.2017

Name of Co-Author	Prof Gill Harvey		
Contribution to the Paper	Assisted with evaluation and editing of manuscript. Permission granted for this paper to be included in this thesis.		
Signature		Date	30-10-17.

Innovation and Translation

Improving oral health for older people in the home care setting: An exploratory implementation study

Adrienne Lewis, Alison Kitson and Gill Harvey
SA Dental Service and School of Nursing, University of Adelaide,
Adelaide, South Australia, Australia

Aim: To explore how home care providers can support older people to maintain good oral health through implementing a model called Better Oral Health in Home Care (BOHHC).

Methods: A mixed method, pre- to post-implementation design was used. The Promoting Action on Research Implementation in Health Services framework informed the model's implementation process.

Results: High levels of dental need were identified at pre-implementation. Older people self-reported significant oral health improvements following the introduction of tailored home care strategies by care workers, who in turn reported a better understanding and knowledge of the importance of oral care for older people.

Conclusion: The BOHHC Model provided an evidence-based approach for community-based prevention and early detection of oral health problems. Improving oral health for older people in the home care setting has significant practice and policy implications which require ongoing intersectoral facilitation involving aged care, vocational health education and dental sectors.

Key words: aged, capacity building, home care services, oral health, quality improvement.

Introduction

Oral health and ageing

Poor oral health compromises healthy ageing as it impacts on an older person's quality of life and general health [1,2]. It causes pain, is costly, disfiguring and results in poor nutrition [1–4]. The mouth acts as a portal for disease sharing links with diabetes, cardiovascular, cerebrovascular and respiratory diseases [2–7]. Recognised as a public health issue, poor oral health increases the likelihood of avoidable hospitalisation from conditions such as aspiration pneumonia [1,2,7].

Correspondence to: Ms Adrienne Lewis, South Australian Dental Service. Email: adrienne.lewis@sa.gov.au

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Main oral health concerns relate to the increased retention and complex restoration of natural teeth in older age groups. Problems include tooth decay, gum disease, dry mouth, tooth loss and oral cancers [4,8,9]. Importantly, these can be managed by daily oral health care and access to dental treatment [9–12]. While older people may or may not visit a dental professional on a regular basis, those receiving aged care develop ongoing relationships with staff who are well placed to support good oral health [11,12]. The literature, however, describes the aged care workforce as lacking the appropriate oral health knowledge and skills to provide effective oral health care for older people [12–14].

Models of oral health care

In 2007, the Australian Government, under the Encouraging Better Practice in Aged Care (EBPAC) Program, funded a public dental service and residential aged care consortium to improve the oral health of residents through the development of the Better Oral Health in Residential Care Model [15]. This promoted a multidisciplinary approach based on four key processes: oral health assessment, oral health-care planning, actioning daily oral care and dental treatment [15]. In 2010, it was disseminated as a national 'train the trainer' program under Australia's first Nursing Home Oral and Dental Health Plan.

With future estimates predicting 80% of formal aged care will be provided in the home care setting, home care delivery will become more complex as it strives to meet the needs of older people with multiple comorbidities, diabetes and dementia [16–18]. Similarly, the necessity for good oral health must become a higher priority [1–3]. In 2012, the Australian Government, under the EBPAC Program, funded a public dental service and home care provider partnership. The aim was to improve the oral health of older people receiving home care by adapting the residential care model to suit the home care setting. As described in Figure 1, it is called the Better Oral Health in Home Care Model (BOHHC Model) and was grounded on the following propositions: good oral health is essential for healthy ageing, good oral health begins at home by supporting older people with daily oral care, and it requires a multidisciplinary approach [1–15].

Objectives

To explore how older people can maintain good oral health through the implementation of the BOHHC Model by:

Figure 1: Better Oral Health in Home Care Model.

Oral health assessment	
This may be performed by the GP as part of an older person's medical assessment or by the nurse or care coordinator on commencement of home care support and subsequently at the client's annual review and as the need arises. The aim is to ensure oral health is a recognised and practiced part of health assessment and that appropriate care planning and dental referral are delivered when required.	
Six question oral health assessment tool:	
1. Do you have any of your own natural teeth?	
2. Have you had pain in your mouth while chewing?	
3. Have you lost any fillings, or do you need a dental visit for any other reason?	
4. Have you avoided laughing or smiling because of problems with your teeth, mouth or dentures?	
5. Have you had to interrupt meals because of problems with your teeth, mouth or dentures?	
6. Have you had difficulty relaxing because of problems with your teeth, mouth or dentures?	
Oral health-care planning	
The care coordinator in consultation with the client and/or the client's family develops an oral health-care plan based on the outcome of the oral health assessment and Better Oral Health in Home Care recommendations.	
Better Oral Health in Home Care:	
<ul style="list-style-type: none"> • care of natural teeth • care of dentures • relief of dry mouth 	<ul style="list-style-type: none"> • tooth friendly eating • seeing a dental professional • quit smoking
Oral health care	
Home care workers encourage and support the client and/or the client's family to maintain daily oral care based on the oral health-care plan. Home care workers report changes in a client's oral health to the care coordinator to ensure an appropriate client reassessment is made.	
Dental referral and treatment	
Referral to a dental professional for a dental examination and treatment is made on the basis of the oral health assessment with the care coordinator and home care worker assisting the client and/or the client's family to attend their appointment.	

1. Describing the role home care providers play in achieving better oral care outcomes for their clients.
2. Assessing older people's self-reported oral health outcomes following implementation of the BOHHC Model.

Methods

While the primary strategy for embedding oral health improvements in residential aged care practice was staff training [19,20], contemporary literature on knowledge translation (KT) indicates there is more to sustaining oral health improvements [21]. KT demands an active process acknowledging the influence of the context in which change is taking place and the need to tailor implementation strategies to respond to this context [21]. A KT conceptual framework called Promoting Action on Research Implementation in Health Services (PARIHS) was used to inform the transfer of the model of oral health care developed for residential aged care to suit the home care setting [22,23]. As described in Figure 2, the PARIHS framework acknowledges the multidimensional nature of implementation, proposing it is dependent on the evidence being implemented, the context in which the evidence is introduced and the way in which the process is facilitated [22,23]. A mixed method, pre- to post-implementation study across four community aged care settings was used to assess this.

Recruitment of older people

Older people were invited to participate if they received home care from one of four partner home care providers and were eligible for public dental care by being a holder of a current Centrelink pension or health-care card. Home care providers fulfilled a range of criteria including providing services under the Australian Government Home Care Package Program and/or Home Support Programme to non-Indigenous and Indigenous clients situated in metropolitan, regional and rural locations in two Australian states.

Data sources

Data collection was based on the pre- to post-implementation of the BOHHC Model's four key processes of oral health assessment, oral health-care planning, oral health-care delivery and dental referral, as described in Figure 1.

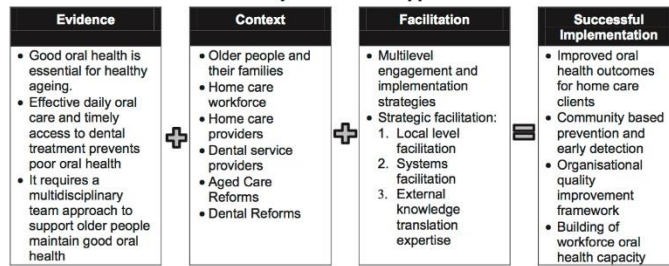
Oral health assessment

Data were collected from a pre-implementation baseline audit undertaken to identify whether oral assessment took place. A post-implementation audit was used to identify the uptake of oral health assessment.

Oral health-care planning

Data were collected from a pre-implementation audit of care plans looking for evidence of dentate status and

Figure 2: Better Oral Health in Home Care Model implementation approach.



appropriate care planning. A post-implementation audit was used to identify the uptake of the model's care recommendations.

Oral health-care service delivery

Home care worker's knowledge of preventive oral care and attitudes to oral care were measured by pre- and post-training questionnaires. A separate questionnaire evaluated training. The questionnaires were validated by previous aged care projects and had a Likert scale design [15,24].

Dental referral

Data from oral health assessment (Figure 1) were used to identify older people in need of dental referral. It also informed the urgency of dental care.

Older people's self-reported oral health outcome data

Data from older people's self-reported responses to oral hygiene and dental treatment pre- and post-implementation questionnaires described oral health outcomes. The oral hygiene questionnaire measured preventative oral health behaviour, oral hygiene neglect and participant's beliefs about their ability to perform oral hygiene tasks [15,24]. The dental treatment questionnaire measured dental treatment goal attainment, chewing capacity, global self-rating of oral health and general health and included the Oral Health Impact Profile-14 item (OHIP-14) for rating oral health quality of life [15,24]. The questionnaires were validated by previous aged care projects and had a Likert scale design [15,24]. Client dental treatment data were also obtained.

Context and implementation information

Context and implementation information based upon the dimensions outlined in the PARIHS framework [22,23] was collected as qualitative data from several sources including minutes from 10 steering committee meetings, 31 project team teleconferences and four project team workshops.

Data analysis

Analysis of oral health assessment and care planning data consisted of pre- to post-comparison of assessment activities and care plans. Older people's oral health responses and home care worker responses to oral care were analysed using a combination of descriptive and inferential statistics using SPSS statistics software. Analysis of dental referral data involved descriptive analysis. Thematic analysis was used to analyse context information and process data [25].

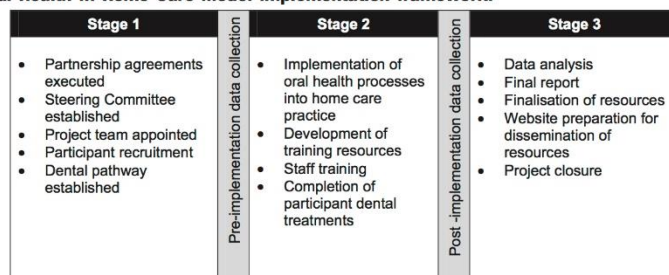
Ethics approval

Ethics approval was granted by four Human Research Ethics Committees representative of two state government health services, an Indigenous health council and a university.

Implementation process

Figure 3 summarises the implementation process which took place from June 2012 to December 2014. The project team acted as implementation facilitators and involved a director and manager from the lead public dental service (defined as external facilitators), plus four home care coordinator project officers and a dental officer from the second public dental service (operating as local facilitators).

Figure 3: Better Oral Health in Home Care Model implementation framework.



Results

Of 608 eligible clients, 319 (52%) participated. They included 141 non-Indigenous and 178 Indigenous clients. The mean age of non-Indigenous participants was 81 years and 62 years for Indigenous participants. The overall gender ratio was 68% females: 32% males. There was no significant difference in the mean age and gender ratio between those who consented and those who did not. Services ranged from 54% of participants on home support (basic care), 34% on a level 2 home care package (low care) and 12% on a level 4 home care package (high care) of which 4% received dementia support. All Indigenous participants were home support recipients.

Oral health assessment

At pre-implementation, no evidence of oral health assessment was found. Post-implementation identified oral health assessment uptake (Figure 1) by the four home care providers. Home care coordinators assessed 317 of 319 participants of which 99% required dental referral. The first dental screening question 'Do you have your own teeth?' informs dentate status. This showed 63% of older people had some natural teeth present. For non-Indigenous participants, this was 47.8%, and for Indigenous participants, it was 52.5%. The remaining screening questions were pooled to create three levels of priority care. Analysis classified 46% of non-

Indigenous participants as high priority, 53% as medium priority and 1% as low priority. For Indigenous participants, 62% were high priority and 38% were medium priority. These findings indicated high levels of dental need.

Oral health-care planning

At pre-implementation, little evidence of oral health-care planning was found. Post-implementation evaluation showed that care planning based on the recommendations in Figure 1 had been incorporated into organisational procedures by the four home care providers. Together with oral health assessment information, care coordinators used these procedures to plan appropriate oral care.

Oral health service delivery

Care workers represent about 81.2% (per head count) of the Australian home care workforce [26]. Of the 205 participating home care staff, 84% were direct care home care workers and 13% were care coordinators (10% of these previously worked as care workers and 3% were registered nurses) with 3% classified as other. Care workers were mainly Australian-born females with a median age of 47.8 years who worked on a casual part-time basis; 72% held relevant aged care qualifications, 21% had no qualification, and for 7% the qualification was unknown. The predominant qualification was a Certificate III in Aged Care.

Figure 4: Home care worker oral health training outcomes.

Home care worker oral health training outcomes (n = 171 useable pre- and post-implementation questionnaires)	
Oral health knowledge	Pre- and post-comparison
Prevention of tooth decay	Increased from 83.9% to 88.5% (<i>P</i> > 0.05, McNemar test)
Prevention of gum disease	Increased from 95.2% to 96.4% (<i>P</i> > 0.05, McNemar test)
Oral health attitude	Pre- and post-comparison
Rating of oral care as important compared with other types of personal care	Decreased from 96.3% to 91.2% (<i>P</i> > 0.05, McNemar test)
Rating of oral care as important to themselves	Increased from 96.9% to 97% (<i>P</i> > 0.05, McNemar test)
Oral care provision	Pre- and post-comparison
Care worker dislike of assisting older people with oral care	Decreased from 23% to 17.1% (<i>P</i> > 0.05, McNemar test)
Prevented from providing oral care due to lack of time	Decreased from 37% to 35.1% (<i>P</i> > 0.05, McNemar test)
Prevented from providing oral care due to client behaviour or physical difficulties	Decreased from 61.8% to 50.8% (<i>P</i> > 0.05, McNemar test)
Prevented from providing oral care due to lack of oral care equipment	Decreased from 27.4% to 20.6% (<i>P</i> > 0.05, McNemar test)
Able to finish assigned oral care tasks.	Increased from 82.9% to 83.6% (<i>P</i> > 0.05, McNemar test)
Evaluation of oral health training	Post-training
Stimulated my interest	84.5%
Helped me to understand oral health assessment	91.4%
Provided sufficient information	90.1%
Helped me to understand the need for dental referral	90.1%
Provided sufficient oral health guidance	91.9%
Prompted me to consider the dependence for oral care	87%
Included relevant special comments that developed my understanding of an oral health-care plan	87.1%
Informed me on the oral care to be included in overall care	89.8%
Response to oral health information provided	Post-training
Held my attention	84.1%
Is clearly communicated	95%
Is relevant	95%
Is appropriate	94.9%

Figure 5: Older people's self-reported oral health outcomes.

Older people's self-reported oral health outcomes	
<i>(n = 149 useable pre- and post-implementation questionnaires)</i>	
Global self-rated oral health (excellent, very good/good)	59% increased to 75% (<i>P</i> < 0.01, McNemar test)
Global self-rated general health (excellent, very good/good)	35% increased to 48% (<i>P</i> > 0.05, McNemar test)
Oral health quality of life – extent. This is the number of oral health impacts (problems) out of 14 reported fairly often or very often.	2.1 impacts reduced to 0.5 impacts (<i>P</i> < 0.05, paired t-test)
Oral health quality of life – severity. This is the sum of ordinal responses taking into account oral health impacts (problems) out of 14 experienced occasionally or hardly ever.	11.75 reduced to 4.73 (<i>P</i> < 0.05, paired t-test)
Chewing incapacity – unable to eat three or more foods	92% reduced to 87% (<i>P</i> > 0.05, McNemar test)
Dental goal attainment – 7 rung ladder with 1 the lowest rating to highest rating of 7	3.07 increased to 5.11 (<i>P</i> < 0.05, paired t-test)
Oral hygiene behaviour – teeth or dentures brushed twice a day	39.4% increased to 53.1% (<i>P</i> > 0.05)
Oral hygiene behaviour – self- efficacy (score out of 10)	5.47 increased to 6.19 (<i>P</i> < 0.05, paired t-test)
Oral hygiene behaviour – self-competency (score out of 8)	4.50 increased to 5.94 (<i>P</i> < 0.05, paired t-test)
Past patterns of dental behaviour	32% visited a dentist within the last year. 71% visited a dentist to fix a problem with 51% stating the nature of problem was related to dental pain.
Dental Treatment (n = 197)	
Of the 316 older people identified for dental referral, 197 received dental treatment. Reasons for withdrawing included illness, hospitalisation, entry into residential care or deceased.	
Most common dental services	Diagnostic Preventative Restorative Prosthetic (dentures) General Oral surgery
Average number of dental services	Overall 6.17 Non-Indigenous 6.35 Indigenous 5.93
Average number of dental visits	Overall 2.27 Non-Indigenous 1.77 Indigenous 2.90
Average number of courses of care	Overall 1.34 Non-Indigenous 1.43 Indigenous 1.34
Costs per person (based on Department of Veteran Affairs (DVA) dental officer fee scale (2014))*	Overall \$597 Non-Indigenous \$637 Indigenous \$505
Costs per course of care (based on Department of Veteran Affairs (DVA) dental officer fee scale (2014))*	Overall \$420 Non-Indigenous \$490 Indigenous \$331

*Due to the small size of the participant evaluation cohort this data should not be used to extrapolate the cost of providing dental programs for older people.

Home care duties ranged from domestic support, shopping and meal preparation and personal care. Similarly, the level of support varied from reminding, encouraging, assisting and direct care. Figure 4 summarises results of the pre- to post-staff questionnaires. At baseline, staff reported they understood oral health was important but did not apply this in practice due to an absence of oral care planning, issues managing client behaviour, a lack of oral hygiene products (such as a toothbrush or toothpaste) and a general dislike of this task. Follow-up information indicated staff felt more confident in managing oral care. Their responses to the training were positive.

Older people's self-reported oral health outcomes

Figure 5 describes older people's responses to the pre- to post-oral hygiene and dental treatment questionnaires.

Older people self-reported considerable improvement in their oral health with some self-reporting better general health.

Clinical evidence supporting a reduction in oral diseases, however, could not be established as the study time frame did not allow for sufficient data collection. Furthermore, it could not be concluded whether oral health improvements resulted from the combined intervention strategies or one particular element.

Context analysis

The home care setting was defined as consisting of older people and their families, the home care workforce, home care providers, dental service providers and the broader aged care and dental sectors. This included Home Care

Standards, Australian Government aged care reforms (Aged Care Gateway, consumer directed care, a new home care package structure) [16], the National Oral Health Plan and Australian Government dental reforms [9,27].

Thematic analysis identified home care workers as 'lone workers'. This was because they worked unsupervised in isolation in older people's homes with minimal opportunity to meet colleagues and care coordinators. The workplace culture was one in which home care was perceived as a collection of tasks to be delivered as quickly as possible. This was described as a 'task and time' [28] approach to care delivery. Apart from initial care planning and annual reviews, it was observed that care coordinators tended not to visit clients and relied on home care workers to alert them to changes.

This understanding of context was used to shape the strategies needed for continuity of oral health care for older people. This was described as promoting a 'think and link' [28] approach to home care. A 'Stop, Check and Act' problem solving framework and an oral health reporting guide were developed to alert home care workers to changes in oral health status and to report these to care coordinators. This feedback prompted care coordinators to undertake an oral health assessment and review care planning. A simple six question oral health assessment tool [24] was introduced for use by non-nurse care coordinators because it does not require clinical assessment skills. Dental referral pathway information and a dental visit checklist were developed to assist care coordinators to case manage a dental visit. Similarly, the development of oral health self-care guides for older people and their families supported informed consumer directed care. Resources can be accessed from www.sahealth.sa.gov.au/OralHealthForOlderPeople.

Implementation process analysis

Multilevel engagement took place. Formal partnership agreements ensured higher level commitment to participate in organisational change. This was reinforced by home care manager representation on the project steering committee and participation in project team workshops. Teleconferences, regular site visits and workshops were effective strategies in supporting home care coordinator project officers. Linking dental clinic staff with home care coordinators assisted client dental referral coordination.

Three strategic levels of facilitation were used to implement the BOHHC Model. This involved home care coordinator project officers building relationships and implementing oral health processes at the practice level between staff and clients. This was particularly important in the development of trust, respect and culturally appropriate messages within the Aboriginal community. Close mentoring from the project director and manager was required to support home care coordinator project officers

in their role of local facilitators. A second level of facilitation involved organisational change such as introducing the BOHHC Model into home care procedures, producing training resources, delivering staff training and developing dental pathways. A greater skill base and the ability to liaise and influence between aged care and dental hierarchies were required and were undertaken by the project director and manager. A third level of facilitation consisted of external KT expertise. This introduced the concept of engaged scholarship [29] and guided the project team to check assumptions and interpret the interplay of different perspectives such as values, norms and tacit knowledge to frame the issues sensitive to the home care context. The KT expert mentored the project director and manager to undertake the dual roles of facilitator and evaluator of the implementation processes [30].

Discussion

As with the residential aged care study, the implementation of four key oral health processes (oral health assessment, oral health-care planning, actioning daily oral care and dental treatment) into care delivery led to improved self-reported oral health outcomes for older people. This is significant given the finding that participating Indigenous and non-Indigenous home care clients were identified as experiencing high levels of dental need. While this suggests the model is transferrable, implementation process analysis indicated this was optimised through multi-level facilitation and the implementation of tailored home care strategies. The KT approach using the PARIHS framework [22,23] successfully guided this process by identifying a number of oral health KT barriers and enablers.

Faced with the complexity of older people's general and oral health profiles, care versus service provision presents itself as a conundrum. The main barriers to embedding sustainable oral health-care improvements and access to dental treatment relate to the consequences of a 'task and time' [28] service delivery approach and a lack of shared knowledge and experience between the home care and dental care sector. These contribute to a 'disconnect' between aged care and dental sector across the levels of government policy, organisational systems and practice settings.

The national reforms [16,27] were defined as enablers: they set policy directives for promoting ageing well at home. The four oral health processes were recognised as providing organisational strategies for monitoring and controlling oral health risks. Therefore, as a quality improvement initiative, the BOHHC Model promotes continuity of oral health care and improved client oral health outcomes. This links well with Home Care Standards and has the potential to act as an out of hospital strategy for the home care sector by helping to reduce avoidable hospital admissions and the burden of oral health disease on the health system. At the practice

setting level, home care workers, given appropriate training, were recognised as enablers. This was due to their unique position of knowing the client better than anyone else in the organisation, enhanced by their role of assisting older people in their homes. While home care sector investment in ongoing oral health education would empower staff to adopt a ‘think and link’ [28] approach to care, engagement from the vocational health training sector was identified as a strategy for improving the oral health capacity of the emerging aged care workforce. As highlighted in recently published KT literature [30], the active role of facilitation was also recognised as a key enabler. The use of multilevel facilitation was seen as playing a pivotal role in optimising the translation of oral health knowledge into home care practice.

Conclusion

Given the absence of oral health guidelines in the participating home care organisations, the implementation of BOHHC Model into home care practice provided community-based prevention and early detection of oral health problems for older people in the home care setting. The description of barriers and enablers suggests that improving oral health for older people has practice and policy implications which require ongoing intersectoral facilitation involving aged care, vocational health education and dental sectors. The PARIHS framework was instrumental in transferring an oral health model of care developed for residential aged care to suit the home care setting.

Limitations

This study was an exploratory implementation project and as such has provided a wealth of information on the home care workers and the clients who are cared for in their own homes. Further research is needed to identify whether the BOHHC Model reduces the clinical presence of oral diseases. This includes assessing which aspects of the model are essential to improving oral health outcomes as well as evaluating the strategies which optimise sustainable systems change supporting older people to maintain good oral health.

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Key Points

- Home care clients were identified as having high levels of dental need.
- Home care providers are well placed to play a key role in providing community-based prevention and early detection of oral health problems for older people.
- Coordinated care involving home care coordinators and dental clinic staff was useful in assisting home care clients to access dental services.

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CHAPTER 7: PUBLICATION 2

Lewis, A, Edward, S, Whiting, G & Donnelly, F 2018, 'Evaluating student learning outcomes in oral health knowledge and skills', *Journal of Clinical Nursing*, vol. 27, no.11–12, pp. 2438–2449, DOI:10.1111/jocn.14082.

The second publication reports on a parallel evaluation of the BOHHC learning and teaching package, using the Kirkpatrick model of learning and training. During this time the candidate designed and implemented the student questionnaires. This study validated that the BOHHC learning and teaching package was relevant for students undertaking an entry-level nursing or aged care qualification, and recommends that the BOHHC package be used to strengthen the oral health content of these courses. Results showed positive levels of student and educator satisfaction. Students described consistently positive attitudes towards oral health and significant self-reported improvements in their oral health knowledge and skills. The paper speculates that contextual factors independent of training (such as workplace culture, care routines and perceptions of oral health care as a low priority) might negatively influence students' longer-term oral healthcare practice. With regard to the fundamentals of care, the study concluded that regardless of differences in scope of practice, nurses and care workers must be able to provide consistent standards of daily oral healthcare.

Statement of Authorship

Title of Paper	Evaluating student learning outcomes in oral health knowledge
Publication Status	<input checked="" type="checkbox"/> Published <input type="checkbox"/> Accepted for Publication <input type="checkbox"/> Submitted for Publication <input type="checkbox"/> Unpublished and Unsubmitted work written in manuscript style
Publication Details	Lewis, A., Edwards, S., Whiting, G., & Donnelly, F. (2017) Evaluating student learning outcomes in oral health knowledge and skills, <i>Journal of Clinical Nursing</i> , online first. doi: 10.1111/jocn.14082

Principal Author

Name of Principal Author (Candidate)	Adrienne Lewis		
Contribution to the Paper	Performed analysis and interpretation of data, wrote manuscript and acted as corresponding author.		
Overall percentage (%)	80%		
Certification:	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper.		
Signature		Date	19.4.18

Co-Author Contributions

By signing the Statement of Authorship, each author certifies that:

- i. the candidate's stated contribution to the publication is accurate (as detailed above);
- ii. permission is granted for the candidate to include the publication in the thesis; and
- iii. the sum of all co-author contributions is equal to 100% less the candidate's stated contribution.

Name of Co-Author	Suzanne Edwards		
Contribution to the Paper	Supervised quantitative data analysis assisted with data interpretation and manuscript evaluation. Permission granted for this paper to be included in this thesis.		
Signature		Date	19/4/18

Name of Co-Author	Glenda Whiting		
Contribution to the Paper	Assisted with implementation of the study and editing of manuscript. Permission granted for this paper to be included in this thesis.		
Signature		Date	6/4/18

Name of Co-Author	Frank Donnelly		
Contribution to the Paper	Assisted with implementation of the study and editing of manuscript. Permission granted for this paper to be included in this thesis.		
Signature		Date	19/4/18

Evaluating student learning outcomes in oral health knowledge and skills

Adrienne Lewis BN, MNstud, MPM, PhD Candidate¹  | Suzanne Edwards GDipMa, GDipMStat, BN, Statistician² | Glenda Whiting BN, MBA, MEd, Principal Lecturer³ | Frank Donnelly BN, PhD, MN, Lead Interprofessional Learning and Innovation¹

¹Adelaide Nursing School, The University of Adelaide, Adelaide, SA, Australia

²Data, Design and Statistics Service, Adelaide Health Technology Assessment, School of Public Health, The University of Adelaide, Adelaide, SA, Australia

³Health, TAFE SA, Gilles Plains, SA, Australia

Correspondence

Adrienne Lewis, Adelaide Nursing School, The University of Adelaide, Adelaide, SA, Australia.
Email: adrienne.lewis@adelaide.edu.au

Aims and objectives: To evaluate whether a set of oral health resources designed for workforce training was relevant for students undertaking an entry-level nursing or aged care qualification.

Background: Oral health is one of the most neglected aspects of nursing care experienced by older people. Despite efforts to improve aged care worker oral health knowledge and skills, one-off training and rapid staff turnover have hindered the success of workplace programmes. Inadequate oral health content in entry-level nursing and aged care qualifications has perpetuated this.

Design: Kirkpatrick's training and evaluation model was used to evaluate the resources developed by a project called Building Better Oral Health Communities. Students used them as prescribed study materials and completed pre- and postintervention questionnaires. Educators were interviewed to obtain their feedback. Quantitative data were analysed using descriptive and inferential statistics. Qualitative data were collated according to relevance to learning, presentation style and interest.

Results: Evaluation showed high levels of student and educator satisfaction. Student learning outcomes demonstrated consistently positive attitudes and significant self-reported improvements in oral health knowledge and skills. Irrespective of course type, students gained similar levels of oral health knowledge and skills following use of the resources.

Conclusion: Nurses and care workers must be able to provide consistent standards of oral health care as a fundamental part of caring for patients. Validated as an effective learning and teaching package, it is recommended that these resources be used to strengthen the oral health content of entry-level nursing and aged care qualifications.

Relevance to clinical practice: Building the oral health capacity of nurses and care workers is one way of reversing oral health neglect and improving the quality of care provided to older people.

KEYWORDS

aged care, care worker training, fundamental care, nurse education, older people, oral health

1 | INTRODUCTION

As a low-cost fundamental intervention, daily oral health care offers older people maximum benefits in terms of improved quality of life, lower risk of serious health conditions (such as malnutrition, poor diabetic control, aspiration pneumonia and bacteraemia) and lower incidence of unnecessary suffering, hospitalisation and/or premature death (Sloane et al., 2013; Terpenning & Shay, 2002; Thorne, Kazanjian, & MacEntee, 2001). Given the 1960s claim by the highly respected nurse theorist, Virginia Henderson, that the quality of nursing care could be judged by the condition of a person's mouth (Henderson, 1960; cited in Coleman, 2002, p. 193), it is disturbing that oral health has been described as one of the most neglected aspects of nursing care experienced by older people (Chalmers & Pearson, 2005; Coker, Pleog, Kaasalainen, & Cater, 2016; Miegel & Wachtel, 2009).

2 | BACKGROUND

2.1 | Oral health neglect

Contrary to their valuing oral health as one of the fundamentals of care (Coker et al., 2016; Kitson, Muntlin Athlin, & Conroy, 2014), it is widely recognised that nurses and care workers dismiss it as a low priority (Knevel, Foley, Gussy, & Karimi, 2016; McNally et al., 2012; Sloane et al., 2013; Wårdh, Berggren, Anderson, & Sörensen, 2002). The main assumptions justifying oral health neglect of older people include rationalising it as the dental profession's responsibility, assuming poor oral health is a normal part of ageing, and likening it to an optional grooming task (de Lugt-Lustig et al., 2014; Wårdh, Jonsson, & Wikstrom, 2012). Failure by care facilities to supply essential resources (such as toothbrushes and toothpastes) is symptomatic of this (Coleman & Watson, 2006; Dharamsi, Jivani, Dean, & Wyatt, 2009). Oral health's low-priority status is also evident by its absence in care plans; alternatively, when it is included, it is not considered mandatory (Coker et al., 2016; Miegel & Wachtel, 2009). Rigid routines, time-rationed workloads and staffing shortages perpetuate this by forcing care to be delivered in a task and time manner according to its perceived level of importance (Chami et al., 2016; Coker et al., 2016; Kitson et al., 2014).

Other reasons for nurse and care worker noncompliance include a lack of confidence or unreliable assumptions about the efficacy of their own oral health standards (which are unlikely to be evidence-based practice for older people); reluctance due to their own dental anxieties; fear of being bitten or hurting older people who exhibit care-resistant behaviours; and the perception that intraoral care is an invasion of privacy (Chalmers & Pearson, 2005; Hoben et al., 2016; Jablonski, Theerrien, & Kolanowski, 2011; McNally et al., 2012; Miegel & Wachtel, 2009). Most disturbing is the ubiquitous negativity attributed to oral health care (Hopcraft, Morgan, Satur, Wright, & Darby, 2010; Janssens et al., 2016; Knevel et al., 2016; Sloane et al., 2013), with some nurses and care workers openly admitting they would rather clean up an incident of incontinence than brush older people's teeth (Dharamsi et al., 2009; Unfer, Braun, de Oliveira Ferreira, Raut, & Batista, 2011).

What does this paper contribute to the wider global community?

- It recognises the importance of oral health as a fundamental of care and that there is a great need to improve the standard of nursing care provided to older people.
- It highlights a need to strengthen the oral health content of entry-level nursing and aged care qualifications and encourages educators to use validated oral health learning and teaching resources and engage in interdisciplinary education.
- It raises the awareness that, irrespective of scopes of practice, nurses and care workers must be able to provide consistent standards of oral health care.

2.2 | Oral health knowledge and skill gap

A lack of appropriate oral health knowledge, skills and insight into the high-risk consequences of poor oral health by nurses and care workers has been cited as contributing to oral health neglect (Chalmers & Pearson, 2005; De Visschere et al., 2015; Knevel et al., 2016; Miegel & Wachtel, 2009; Smith & Thomson, 2017). Regardless of whether it is nurse-led assessment and planning, or care delivery delegated to care workers, the impact of a rapidly ageing population—coupled with the complexity of older people's mouths (such as greater retention of natural teeth, crowns, bridge-work, partial dentures and implants)—will place greater demands on the need for effective oral health care (Forsell, Sjögren et al., 2011; Wårdh et al., 2002). Despite concerted efforts to implement a range of aged care oral health training programmes and/or toolkits (Fricker & Lewis, 2009; McNally et al., 2012; Miegel & Wachtel, 2009; Zimmerman, Sloane, Cohen, & Barrick, 2014), their long-term effectiveness has been hindered by one-off training compromised by rapid staff turnover, budget restrictions and time pressures (Wårdh et al., 2012; Weening-Verbree, Huisman-de Waal, van Achterberg, & Schoonhoven, 2013). Similarly, inadequate oral health content in nursing and care worker training curricula has been cited as perpetuating oral healthcare neglect (Fitzpatrick, 2000; Forsell, Kullberg, Hoogstraete, Johansson, & Sjögren, 2011; Hopcraft et al., 2010; Unfer et al., 2011). Noting the difficulties in sustaining workplace training, an alternative approach to instilling oral health as one of the fundamentals of care would be to strengthen the oral health content of entry-level nursing and aged care qualifications (Hahn, FitzGerald, Markham, Glassmand, & Guenther, 2012).

A recent Australian Government-funded project called Building Better Oral Health Communities (2012–2014) developed a suite of cost-free online learning and teaching resources designed to build the oral health capacity of the aged care workforce (Lewis, Kitson, & Harvey, 2016). The project found that nurses and care workers were highly positive about the oral health education provided, with subsequent care outcomes demonstrating improvements in older people's

oral health. Accordingly, the aim of this study was to evaluate the relevance of these resources for three different student groups which are yet to enter the aged care workforce. These groups included students undertaking a Bachelor of Nursing (BN) to become a registered nurse; students undertaking a Diploma of Nursing (EN) to become an enrolled nurse; and students undertaking a Certificate III Aged Care qualification (Cert III) to become an aged care worker. The objectives were to evaluate whether students found the resources relevant to their learning needs; whether the resources increased the oral health knowledge and skills of students; and whether the educators teaching these students found the resources to be relevant to the teaching of oral health as one of the fundamentals of care.

3 | METHOD

3.1 | Ethical consideration

Ethics approval (number H2016-024) was granted by the University of Adelaide Human Research Ethics Committee.

3.2 | Study design

The evaluation study took place from June–December 2016 and involved the university and vocational education sectors. The study design was based on Kirkpatrick's Model of learning and training evaluation. This approach is a recognised training industry standard, which has been widely applied across the health sector (Bates, 2004; Beech & Leather, 2006). As described in Table 1, the model identifies four levels at which to evaluate training or educational innovations. Level one evaluation refers to the participants' reaction to the training and considers their subjective opinions about what they liked or disliked about the training programme (Barr, Hammick, Koppell, & Reeves, 1999; Bates, 2004; Beech & Leather, 2006; Curran & Fleet, 2005; Sargent et al., 2011). This level gauges the interest of participants and is measured as satisfaction with regard to specific components of the training, such as relevance to learning needs, and presentation style (Curran & Fleet, 2005; Smidt, Balandin, Sigafos, & Reed, 2009). Level two evaluation involves measuring whether learning has taken place in terms of participants' knowledge and/or skills (Barr et al., 1999; Bates, 2004; Beech & Leather, 2006; Curran & Fleet, 2005; Sargent et al., 2011; Smidt et al., 2009). Level three evaluation addresses the extent to which the knowledge and skills gained through the training have been applied in practice (Barr et al.,

TABLE 1 The Kirkpatrick training and learning evaluation model

Level	Reaction	Learner satisfaction
Level 1	Learning	Learning outcomes (knowledge and skills)
Level 2	Behaviour	Performance improvement (transfer of learning to workplace)
Level 3	Results	Patient or healthcare outcomes

Source: Curran and Fleet (2005, p. 563) and Sargent et al. (2011, p. 169).

1999; Bates, 2004; Beech & Leather, 2006; Curran & Fleet, 2005; Sargent et al., 2011; Smidt et al., 2009). Level four evaluation describes the results of the training, measuring improvements in care and patient outcomes (Barr et al., 1999; Bates, 2004; O'Malley, Perdue, & Petracca, 2013; Sargent et al., 2011). While the outcome measurements from each level are not necessarily hierarchical, they are considered a useful starting point for comprehensive evaluation approaches to better inform policy and development (Hammick, Freeth, Kopple, Reeves, & Barr, 2007). For the purposes of this study, only levels 1 and 2 were evaluated because it was recognised that the monitoring of levels 3 and 4 would need to take place over a longer period and could be influenced by factors other than training (Beech & Leather, 2006; Curran & Fleet, 2005; Hammick et al., 2007; Smidt et al., 2009).

Prior to commencing the study, course coordinators identified what course or unit of competency (which included a clinical placement in aged care) would be most appropriate for the evaluation of the resources. Subsequently, participants were invited to join the study if they were a BN student undertaking a course of study called "health assessment and clinical nursing," a EN student undertaking a personal care unit of competency called "contribution to client assessment and development of a nursing care plan" or a Certificate III Aged Care student undertaking a personal care unit of competency called "providing support to meet personal care." Educators teaching these students were also invited to participate.

Students used the Building Better Oral Health Communities resources as prescribed study materials. They were directed to the following website (www.sahealth.sa.gov.au/OralHealthForOlderPeople) via their student/course communication platform (such as Blackboard or Moodle) and were instructed to complete five topics during the course or unit of competency. Topic 1 "better oral health care" covered factors contributing to poor oral health and its consequences on an older person's quality of life and well-being. Topic 2 "dementia and oral care" reviewed techniques in how to encourage participation in oral care and avoid care-resistant behaviours. Topic 3 "understanding the mouth" studied issues of acid attack on teeth, tooth-friendly eating, the implications of dry mouth, prevention of gum disease, oral health assessment, care planning and dental

TABLE 2 Student age, gender, country of birth and past experience as personal carer, by course

Variable	Bachelor of nursing (N = 41)	Diploma of nursing (N = 66)	Certificate III aged care (N = 17)
Age: Median (IQR)	20 (19.0, 21.8)	28 (20.5, 34.5)	34 (24.0, 42.0)
Gender (Female-N [%])	39 (95)	54 (82)	16 (94)
Country of birth (Born in Australia—N [%])	37 (90)	39 (59)	13 (77)
Experience as a personal carer (Yes-N [%])	18 (22)	32 (24)	6 (18)

TABLE 3 Student gender, country of birth and previous experience as a personal carer, by course

Variables	p Value
Course and gender	.098 (Fisher's exact test)
Course and country of birth	.001 (Fisher's exact test)
Course and previous experience as a personal carer	.839 (Pearson chi-square)

Bold text indicates statistical significance with a p value of <.05.

referral pathways. Topic 4 “care of natural teeth” provided instructional information on toothbrushing techniques, including positioning of people dependent on care (e.g., the use of a cradle-hold technique routinely used by dental professionals). Topic 5 “care of dentures” presented information on how to remove and reinsert full and partial dentures, along with denture brushing techniques. Each topic had specified learning outcomes and consisted of a set of activities such as reading evidence-based information, watching an audiovisual resource and answering a reflective question worksheet. The estimated time to complete each topic was 30 min.

3.3 | Data collection

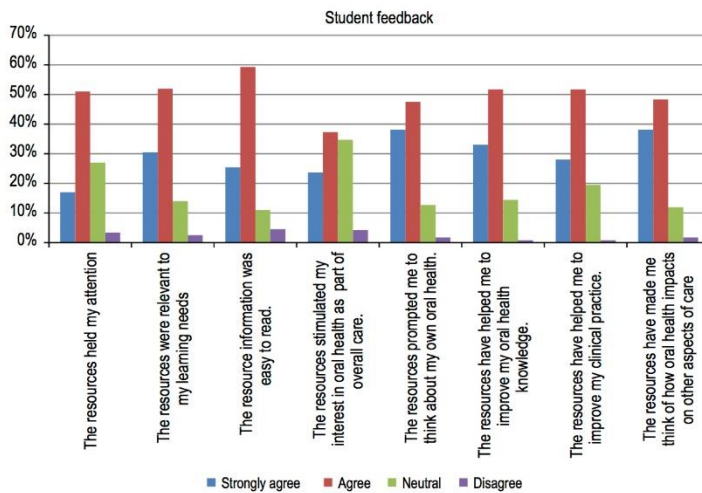
Students were invited to complete a questionnaire at the commencement of their respective course or unit and another when it had been completed. The preintervention questionnaire collected data on age, gender, course of study, country of birth, past experience as a personal carer and self-reported responses to a series of questions on oral health knowledge, skills and attitude using a Likert scale (1 = strongly agree, 2 = agree, 3 = neutral, 4 = disagree, 5 = strongly disagree). The postintervention questionnaire collected data on responses to the same series of questions on oral health knowledge, skills and attitude, along with some additional questions about the resources. Student responses to the

resources were also captured in a number of open-ended questions. The student questionnaires were designed specifically for this study and were pilot-tested before implementation. Data on educator feedback were obtained through semistructured interviews.

3.4 | Data analysis

Quantitative data from the student questionnaires were analysed using descriptive and inferential statistics using SPSS statistics software (IBM SPSS Statistics, version 24, 2016). Categorical data were described using frequencies and percentages compared across courses. Pre- and postintervention questions were aggregated into categories of knowledge, skills and attitudes. Cronbach's alpha was used to measure the internal consistency within the knowledge, attitudes and skills composite variables. Linear mixed-effects models were undertaken to investigate the association between dependent variables: knowledge, skills and attitudes, and the interaction between course and period (pre/postintervention). Univariate linear mixed-effects regressions were performed separately for each dependent variable: knowledge, skills and attitudes by course, and then against the covariates (in separate models) of gender, age, country of birth and past experience as a personal carer. Covariates with p value < .2 were included in a multivariate model for each outcome. In the adjusted linear mixed-effects models, a p value of <.05 indicated statistical significance.

Data from postintervention-only questions on resource feedback were examined using ordinal logistic models to investigate the association between each individual question and course using Certificate III Aged Care as the reference value. Regressions tested whether the comparison value (e.g., BN) had odds of a low Likert scale value (1 = strongly agree and 2 = agree) greater than the reference value of Certificate III Aged Care. Univariate ordinal logistic



GRAPH 1 Student feedback on Building Better Oral Health Communities educational resources

regressions were performed separately for each question by course and the covariates (in separate models) of gender, age, country of birth and past experience as a personal carer. Covariates with p value $< .2$ were included in a multivariate model for each question, with course included as the predictor. In the adjusted ordinal logistic regression models, a p value of $< .05$ indicated statistical significance.

Qualitative data obtained from the student responses to postintervention open-ended questions and educator responses to the semistructured interviews were collated using evaluation categories of relevance to learning needs, presentation style and interest.

4 | RESULTS

4.1 | Students

Of 204 students who completed the preintervention questionnaire, the number of matched pre- and postintervention questionnaires was 124. Demographic data are described in Tables 2 and 3. Bachelor of Nursing students were found to be the youngest with Certificate III Aged Care students, the oldest of the student cohort. Students, across the courses, were predominantly female. The association between country of birth and course was found to be statistically significant, with higher percentages of BN students

TABLE 4 Comparing student feedback across courses using ordinal logistic regression models

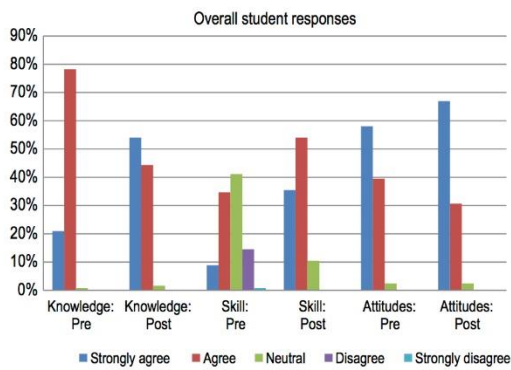
Outcome variable	Covariate variable	Adjusted odds ratio (95% CI)	Adjusted p value	Covariates controlled for in adjusted model
Q1 The resources held my attention	Course		.644	Gender Country
	BN	1.4 (0.66, 2.89)	.392	
	EN	1.4 (0.67, 2.76)	.389	
	Cert III ^a	1.0	—	
Q2 The resources were relevant to my learning needs	Course		.039	Country Experience
	BN	2.6 (1.19, 5.59)	.016	
	EN	2.4 (1.14, 5.03)	.021	
	Cert III ^a	1.0	—	
Q3 The resource information was easy to read	Course		.131	Gender Age Country
	BN	2.0 (0.87, 4.81)	.101	
	EN	2.1 (1.00, 4.57)	.048	
	Cert III ^a	1.0	—	
Q4 The resources stimulated my interest in oral health as part of overall care	Course		.079	Country
	BN	1.8 (0.86, 3.89)	.117	
	EN	2.3 (1.11, 4.65)	.024	
	Cert III ^a	1.0	—	
Q5 The resources prompted me to think about my own oral health	Course		.184	Country
	BN	1.4 (0.68, 3.08)	.338	
	EN	1.9 (0.94, 4.02)	.074	
	Cert III ^a	1.0	—	
Q6 The resources have helped me to improve my oral health knowledge	Course		.029	Age
	BN	1.8 (0.81, 4.18)	.147	
	EN	2.6 (1.27, 5.46)	.010	
	Cert III ^a	1.0	—	
Q7 The resources have helped me to improve my clinical practice.	Course		.145	Age
	BN	1.7 (0.75, 3.90)	.203	
	EN	2.1 (1.00, 4.26)	.051	
	Cert III ^a	1.0	—	
Q8 The resources have made me think of how oral health impacts on other aspects of care	Course		.325	Age
	BN	1.8 (0.78, 3.99)	.160	
	EN	1.63 (0.81, 3.30)	.172	
	Cert III ^a	1.0	—	

BN, Bachelor of Nursing; EN, Diploma of Nursing; Cert III, Certificate III Aged Care qualification.

^aCertificate III Age Care as reference value. Bold text indicates statistical significance with a p value of $< .05$.

TABLE 5 Collated student feedback on resources using Kirkpatrick Model level 1 evaluation categories

Evaluation category	What students liked about the resources	What students thought could be improved
Relevance to learning	<i>Learning needs</i> Informative, helpful, appropriate Improved oral health knowledge and dispelled myths	<i>Learning needs</i> More classroom teaching on oral health
Presentation style	<i>Accessibility</i> Easy to access and find information <i>Structure/format</i> Resources easy to understand Aesthetically pleasing Well set out in a logical manner Precise and well written <i>Visual resources</i> Photographs, videos and quizzes very useful for oral health assessment and care techniques	<i>Accessibility</i> Website sometimes difficult to access and navigate <i>Structure/format</i> Fast-track summaries <i>Visual resources</i> More photographs, videos, interactive online quizzes Cradle-hold technique when brushing teeth was confronting
Interest	<i>Reaction</i> Interactive and engaging Ignited interest in oral health as part of overall care Provided insight into self-care	<i>Reaction</i> No improvement suggested



GRAPH 2 Student responses to pre- and postintervention knowledge, skills and attitude questions

born in Australia than students undertaking Certificate III Aged Care, and lesser numbers of Australian-born students undertaking the EN. A small number of students, across the courses, reported previous experience as a personal carer.

4.1.1 | Kirkpatrick level 1 evaluation results

Kirkpatrick level 1 evaluation used the categories of relevance to learning needs, presentation style and interest in oral health to gauge student satisfaction with the resources. Graph 1 depicts the aggregated positive student feedback to postintervention resource questions, showing minimal "disagree" responses and no "strongly disagree" replies. Further analysis (reported in Table 4) used adjusted

ordinal logistic regression models to show statistically significant associations with student learning needs and improvements in oral health knowledge. For example, associations were demonstrated with Question 2 "The resources were relevant to my learning needs" and course, and with Question 6 "The resources have helped me to improve my oral health knowledge" and course. As described in Table 5, the collated student responses on what they liked about the resources and what could be improved were mainly positive. Reports of website outage and concerns about the teaching of the cradle-hold technique were identified as areas for improvement.

4.1.2 | Kirkpatrick level 2 evaluation results

Kirkpatrick level 2 evaluation involved quantifying whether student learning had taken place in terms of self-reported changes in oral health knowledge, skills and attitudes. Analysis indicated that there was acceptable to good internal consistency within the knowledge, attitudes and skills composite variables. A comparison between aggregated pre- and postintervention student responses is presented in Graph 2. No negative student responses in terms of "disagree" or "strongly disagree" were given at postintervention.

Results comparing the knowledge, skills and attitude scores across courses and time, using linear mixed-effects modelling, are provided in Table 6. Modelling at preintervention showed that BN students had a statistically significant higher mean oral health knowledge score than EN students and Certificate III Aged Care students. Similarly, EN students had a statistically significant higher mean oral health knowledge score than Certificate III Aged Care students. Postintervention modelling indicated that the mean oral health knowledge scores among the courses were not significantly different, suggesting reduced differences across the courses. Each student

group, at postintervention, also demonstrated statistically significant higher scores in their oral health knowledge.

Similarly, student oral health skills at preintervention showed that BN students had a statistically significant higher starting mean oral health skills score than EN students and Certificate III Aged Care students. EN students and Certificate III Aged Care students

demonstrated similar mean oral health skills scores. Postintervention modelling showed reduced differences in the mean oral health skills scores among the courses, suggesting that students achieved similar levels of oral health skills across the courses. Each student group, at postintervention, also demonstrated statistically significant higher scores in their oral health skills.

TABLE 6 Comparing knowledge, skills and attitude scores across courses and time using linear mixed-effects modelling

Outcome variable	Course/Time	Adjusted estimate (95% CI)	Adjusted p value	Covariates controlled for in adjusted model
Knowledge			.053	Country Gender Experience
	Pre			
	BN vs. EN	-2.7 (-4.7, -0.6)	.011	
	BN vs. Cert III	-5.6 (-8.4, -2.7)	<.001	
	EN vs. Cert III	-2.9 (-5.6, -0.2)	.035	
	Post			
	BN vs. EN	1.1 (-2.0, 4.1)	.485	
	BN vs. Cert III	-0.2 (-4.6, 4.1)	.909	
	EN vs. Cert III	-1.3 (-5.4, 2.8)	.523	
	Post vs. Pre			
	BN	-3.4 (-6.2, -0.6)	.019	
	EN	-7.1 (-9.3, -4.9)	<.001	
	Cert III	-8.7 (-13.0, -4.4)	<.001	
Skills			<.001	Country Experience
	Pre			
	BN vs. EN	-0.8 (-1.4, -0.3)	.005	
	BN vs. Cert III	-1.5 (-2.3, -0.6)	.001	
	EN vs. Cert III	-0.6 (-1.4, 0.1)	.113	
	Post			
	BN vs. EN	0.4 (-0.1, 0.8)	.132	
	BN vs. Cert III	0.5 (-0.1, 1.2)	.115	
	EN vs. Cert III	0.2 (-0.8, 0.5)	.594	
	Post vs. Pre			
	BN	-0.9 (-1.5, -0.3)	.002	
	EN	-2.1 (-2.6, -1.7)	<.001	
	Cert III	-2.9 (-3.8, -2.0)	<.001	
Attitude			.813	Gender Experience
	Pre			
	BN vs. EN	0.5 (-1.0, 2.0)	.490	
	BN vs. Cert III	-0.8 (-2.9, 1.4)	.470	
	EN vs. Cert III	-1.3 (-3.4, 0.7)	.206	
	Post			
	BN vs. EN	0.7 (-0.8, 2.3)	.356	
	BN vs. Cert III	0.2 (-2.0, 2.4)	.854	
	EN vs. Cert III	-0.5 (-2.6, 1.6)	.628	
	Post vs. Pre			
	BN	-0.7 (-2.4, 1.0)	.406	
	EN	-0.9 (-2.2, 0.4)	.176	
	Cert III	-1.7 (-4.3, 0.9)	.197	

BN, Bachelor of Nursing; EN, Diploma of Nursing; Cert III, Certificate III Aged Care qualification. Bold text indicates statistical significance with a *p* value of <.05.

Modelling showed that attitudes towards oral health did not change. At preintervention and postintervention, there were no statistically significant differences in the mean oral health attitude scores among the courses. Likewise, there were minor differences in the mean oral health attitude scores between pre- and postintervention for any student group. When these results were compared with the median and interquartile range (25%–75%) of responses to the pre- and postintervention questions (described in Table 7), it was found that, unlike the self-reported differences for oral health knowledge and skills, student's attitudes towards oral health were consistently positive (1 = strongly agree and 2 = agree).

4.2 | Educators

Six educators (two educators from each of the courses of study) were interviewed. All six interviewees had a background as a registered nurse. In terms of Kirkpatrick level 1 evaluation, the aggregated educator responses (presented in Table 8) showed affirmative

responses to relevance to learning, presentation style and interest, inferring that educators endorsed the resources as a useful learning and teaching package. As with the student feedback, website outage and concerns about the application of the cradle-hold technique were identified as areas for consideration.

5 | DISCUSSION

Oral health has been acknowledged as one of the most neglected aspects of nursing care experienced by older people. Insufficient nurse and care worker oral health knowledge and skills have been cited as contributing to this. Given the difficulties in sustaining workplace oral health training programmes, it is recommended that the oral health content of entry-level nursing and aged care qualifications be strengthened. The aim of this study was to evaluate whether a set of resources called Building Better Oral Health Communities was a relevant learning and teaching package for promoting oral health as one of the fundamentals of care

TABLE 7 Median and interquartile range (25%–75%) of student responses to pre- and postintervention knowledge, skills and attitude questions

Outcome variable		Preintervention Median (IQR)	Postintervention Median (IQR)
Knowledge	Q1. I know what good oral health is	2.0 (1.0, 2.0)	2.0 (1.0, 2.0)
	Q4. A hard bristled brush is not best for cleaning teeth (reversed)	4.0 (3.0, 5.0)	2.0 (1.0, 3.0)
	Q5. A dirty mouth may cause pneumonia in older people	3.0 (2.0, 3.0)	2.0 (1.0, 2.0)
	Q6. Drinking plain tap water after eating protects teeth	2.0 (2.0, 3.0)	2.0 (2.0, 3.0)
	Q7. Dentures should be taken out overnight (reversed)	2.0 (1.0, 3.0)	2.0 (1.0, 2.0)
	Q8. Teeth should be brushed a minimum of twice a day	1.0 (1.0, 2.0)	1.0 (1.0, 2.0)
	Q9. Bleeding gums means you should continue to brush teeth (reversed)	2.0 (1.0, 2.0)	1.0 (1.0, 2.0)
	Q10. Dry mouth is a cause of oral health problems	2.0 (2.0, 3.0)	2.0 (1.0, 3.0)
	Q11. Fluoride protects teeth	2.0 (1.0, 2.0)	1.0 (1.0, 2.0)
	Q12. People with diabetes have greater risk of gum disease	2.0 (1.0, 3.0)	2.0 (1.0, 2.0)
	Q14. You should always not rinse after brushing teeth (reversed)	3.0 (2.0, 4.0)	2.0 (1.0, 3.0)
	Q16. You should brush where the teeth meet the gum	2.0 (1.0, 2.0)	2.0 (1.0, 2.0)
	Q18. Normal toothpaste should not be used to clean dentures (reversed)	3.0 (2.0, 3.0)	2.0 (1.2, 3.0)
	Q20. Toothbrushes should be replaced every 3 months	2.0 (1.0, 2.0)	1.0 (1.0, 2.0)
	Q22. Medications are a common cause of dry mouth	2.0 (2.0, 3.0)	2.0 (1.0, 2.0)
Skills	Q24. Smoking increases the risk of oral cancer	1.5 (1.0, 2.0)	1.0 (1.0, 2.0)
	Q25. Frequent snacking does cause tooth decay (reversed)	2.0 (2.0, 3.0)	2.0 (1.0, 3.0)
Attitudes	Q3. I know how to do an oral health assessment	3.0 (3.0, 4.0)	2.0 (2.0, 3.0)
	Q17. I have the skills to be able to provide effective oral care	2.5 (2.0, 3.0)	2.0 (1.0, 2.0)
	Q2. I believe mouth care is a normal part of personal care	1.0 (1.0, 1.0)	1.0 (1.0, 1.0)
	Q13. Older people usually do have natural teeth (reversed)	2.0 (2.0, 2.0)	2.0 (2.0, 2.0)
	Q15. I like cleaning other people's mouths (reversed)	3.0 (2.0, 3.0)	2.0 (2.0, 3.0)
	Q19. I think oral health care is my job, not a dentists (reversed)	1.0 (1.0, 2.0)	1.0 (1.0, 2.0)
	Q21. People with dentures do have oral health problems (reversed)	2.0 (1.0, 2.0)	1.0 (1.0, 2.0)
	Q23. I don't avoid doing mouth care on people with dementia (reversed)	2.0 (1.0, 3.0)	2.0 (1.0, 2.7)
	Q26. Good oral health is important for healthy ageing	1.0 (1.0, 2.0)	1.0 (1.0, 1.0)

TABLE 8 Collated educator feedback using Kirkpatrick Model level 1 evaluation categories

Evaluation category	Collated educator feedback
Relevance	<p>Content</p> <p>Reinforced that oral health was an important aspect of fundamental nursing care</p> <p>Highlighted the consequences of poor oral health</p> <p>Prompted a more comprehensive approach to oral health care by broadening the focus of learning about tooth brushing and denture cleaning to include oral health assessment, oral healthcare planning and dental referral</p> <p>Increased awareness of oral care products, consequences of dry mouth and the use of techniques to manage care resistive behaviours</p> <p>Introduced new skills techniques routinely used by dental professional such as cradle-hold to support a person's head and jaw while brushing teeth. While some educators encouraged students to practise this, others found the approach confronting and a source of much discussion</p> <p>Considered an aged care focus appropriate because when students learn about fundamentals of nursing care, they were more than likely doing an aged care clinical placement</p> <p>Acknowledged that oral healthcare principles could be integrated across the course curriculum and easily adapted to suit the acute care context. For example, oral care for patients who have nasogastric or tracheostomy tubes or patients undergoing chemotherapy</p>
Presentation style	<p>Instructional design</p> <p>Provided educators with a variety of teaching options either using videos to promote classroom group work and discussions with students working through activities and worksheets or as an additional student self-learning resource or for remedial work if students have missed a particular teaching session</p> <p>Assessed the information to be pitched at an appropriate level</p> <p>Found that information could be directly applied to clinical skills teaching</p> <p>Noticed students showing more initiative and increased interest in participation in oral care during clinical skills sessions</p> <p>Technical design</p> <p>Liked that it was a cost-free online resource</p> <p>Considered it to be a logical, well laid-out format</p> <p>Liked that it was highly visual and easy to use</p> <p>Reported that the website was sometimes difficult to access</p>
Interest	<p>Future use</p> <p>Felt inspired to devote more teaching time to oral health care and incorporate the resources as a permanent part of teaching programme</p> <p>Would recommend the resources to other educators</p>

for students studying an entry-level nursing or aged care qualification.

Kirkpatrick's Model of learning and training was implemented as an evaluation tool. For the purposes of this study, only levels 1 and 2 of the model were considered as part of the evaluation process. As prescribed study materials, the resources were used by students to prepare for clinical skills sessions relating to personal care, and for their clinical placement in aged care. In terms of relevance to learning needs, presentation style and interest in oral health, Kirkpatrick level 1 evaluation findings showed positive student satisfaction with the resources. Students considered them informative, helpful and relevant to their learning needs. The resources were generally described as easy to access despite issues of website outage. The presentation style (especially the visual design) was popular with some students, suggesting that more visuals combined with fast-track written summaries were important. Students also considered the resources engaging and easy to understand, prompting an interest in oral health as part of overall care as well as providing insight into self-care.

Educator feedback supported these findings describing the resources as an effective learning and teaching package that enhanced the teaching of oral health as one of the fundamentals of care, strengthened clinical skills sessions and encouraged the integration of a more comprehensive approach to oral health across the course curriculum. This included educators applying the information to suit other contexts such as acute care. The presentation style provided educators with a range of learning and teaching options (both classroom and student self-directed) that could be applied to the different course types to support clinical skills teaching. Educators reported that they felt inspired to devote more time to the teaching of oral health care, committing to incorporate the resources as a permanent part of their teaching programme.

In the Kirkpatrick level 2 evaluation, positive learning outcomes were demonstrated. While the study reported knowledge, skills and attitudes as separate categories, they are acknowledged as interrelated domains of care. Self-reported learning outcomes of BN students, EN students and Certificate III Aged Care students showed

consistently positive attitudes towards oral health, and significant improvements in their oral health knowledge and skills. Not surprisingly, comparisons made among the courses indicated that oral health knowledge and skill levels at preintervention differed across the course types with BN students demonstrating higher levels of knowledge and skills than EN and Certificate III Aged Care students. However, at postintervention, these differences were shown to be smaller, suggesting that, irrespective of the course type and adjusting for other factors (such as age, gender, country of birth and past experience as a personal carer), students reported similar oral health knowledge and skills. From the perspective of fundamental care, this finding is important because it endorses the expectation that, regardless of the differences in scope of practice, nurses and care workers must be able to provide consistent standards of daily oral health care.

While the study demonstrated positive Kirkpatrick level 1 and 2 evaluation findings, some potential barriers were foreseen in terms of (i) level 3 evaluation concerning a student's ability to transfer learning into practice and (ii) level 4 evaluation measuring improved care. For example, apprehension about the application of the cradle-hold position prompted reflection on nurse educator oral health skills. This finding may be indicative of a lack of confidence with what was for all intents and purposes a nontraditional nursing technique, signifying that educators and students might benefit from engaging with the dental sector in interdisciplinary learning and teaching. Likewise, given that students exhibited consistently positive attitudes, factors independent of training (such as the workplace culture, care routines and perceptions of oral health care as a low priority) might have a negative influence on students, resulting in a lowering of the standard of care provided.

Further evaluation therefore calls for longer-term collaborative research (involving dental professionals, nurse educators, care managers, practitioners and policy makers) to facilitate sustainable improvements in older people's oral health care. Consequently, the strengthening oral health learning and teaching of nurses and care workers must go, hand in hand, with advocating for greater aged care reforms that shift oral health from its current low priority to that of mandatory fundamental care. Concurrent research might also include raising the oral health awareness of older people and their families so that, as consumers, they can expect to receive appropriate standards of oral health care. This multidimensional approach is pertinent, given the ageing population and the recognised benefits that good oral health has for older people's quality of life and well-being.

6 | CONCLUSION

The use of Kirkpatrick's Model to evaluate the relevance of the Building Better Oral Health Communities resources for different student groups (BN, EN and Certificate III Aged Care) showed positive levels of student and educator satisfaction. Students demonstrated consistently positive attitudes and significant self-reported improvements in their oral health knowledge and skills. It is therefore

recommended that this validated learning and teaching package be used by educators to promote oral health as one of the fundamentals of care for entry-level nurse and aged care qualifications.

6.1 | Study Limitations

The study did not use a randomised control group design, and the relatively small sample size makes statistical interpretation difficult. Data relied on student self-reporting rather than direct clinical assessment of oral health competency. The questionnaires were developed specifically for this study and require further testing.

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CONTRIBUTIONS

Study design: AL; data collection and analysis: AL, SE and manuscript preparation: AL, SE, FD, GW.

ORCID

Adrienne Lewis  <http://orcid.org/0000-0003-4658-9423>

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CHAPTER 8: PUBLICATION 3

Lewis, A, Harvey, G, Hogan, M & Kitson, A 2019, 'Can oral healthcare for older people be embedded into routine community aged care practice? A Realist Evaluation using Normalisation Process Theory', *International Journal of Nursing Studies*, vol. 94, pp. 32–41, DOI: 10.1016/j.ijnurstu.2018.12.016.

This third paper applies NPT with RE to explore the extent to which the BOHHC model had been embedded in sustainable routine practice at Time 2. During this time, the candidate played a key role as the realist researcher. This study provides a deeper explanation of the contextual factors that contributed to the conceptualisation of oral healthcare as a low priority, basic work-ready skill, and personal care task, and how this, in turn, hindered the embedding of oral healthcare in routine home care practice. In terms of ongoing oral health benefits for clients, continued use of the BOHHC model and sustained home care workforce capacity, it was established that long-term sustainability had not been achieved.

Statement of Authorship

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Principal Author

Name of Principal Author (Candidate)	Adrienne Lewis		
Contribution to the Paper	Performed analysis and interpretation of data, wrote manuscript and acted as corresponding author.		
Overall percentage (%)	80%		
Certification:	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper.		
Signature		Date	22.11.18

Co-Author Contributions

By signing the Statement of Authorship, each author certifies that:

- i. the candidate's stated contribution to the publication is accurate (as detailed above);
- ii. permission is granted for the candidate to include the publication in the thesis; and
- iii. the sum of all co-author contributions is equal to 100% less the candidate's stated contribution.

Name of Co-Author	Prof Gill Harvey		
Contribution to the Paper	Supervised development of work, assisted with data interpretation and manuscript evaluation. Permission granted for this paper to be included in this thesis.		
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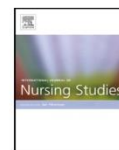
Name of Co-Author	Ms Michelle Hogan		
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Signature		Date	23/11/18

Name of Co-Author	Prof Alison Kitson		
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Can oral healthcare for older people be embedded into routine community aged care practice? A realist evaluation using normalisation process theory

Adrienne Lewis^{a,b,*}, Gill Harvey^b, Michelle Hogan^c, Alison Kitson^d

^a South Australian Dental Service, GPO Box 864, Adelaide, SA, 5000, Australia

^b Adelaide Nursing School, Adelaide Health & Medical Sciences Building, The University of Adelaide, SA, 5005, Australia

^c Helping Hand Inc, 34 Molesworth St, North Adelaide, SA, 5006, Australia

^d College of Nursing and Health Sciences, Flinders University, Sturt Campus, Sturt Road, Bedford Park, SA, 5042, Australia



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ABSTRACT

Background: An intervention 'Better Oral Health in Home Care' was introduced (2012–2014) to improve the oral health of older people receiving community aged care services. Implementation of the intervention was theoretically framed by the Promoting Action on Research Implementation in Health Services framework. Process outcomes demonstrated significant improvements in older people's oral health.

Objective: To evaluate the extent to which the intervention has been embedded and sustained into routine community aged care practice 3 years after the initial implementation project.

Design: A Realist Evaluation applying Normalisation Process Theory within a single case study setting.

Setting: Community aged care (home care) provider in South Australia, Australia.

Participants: Purposeful sampling was undertaken. Twelve staff members were recruited from corporate, management and direct care positions. Two consumers representing high and low care recipients also participated.

Methods: Qualitative methods were applied in two subcases, reflecting different contextual settings. Data were collected via semi-structured interviews and analysed deductively by applying the Normalisation Process Theory core constructs (with the recommended phases of the Realist Evaluation cycle). Retrospective and prospective analytic methods investigated how the intervention has been operationalised by comparing two timeframes: Time 1 (Implementation June 2012–December 2014) and Time 2 (Post-implementation July 2017–July 2018).

Results: At Time 1, the initial program theory proposed that multi-level facilitation contributed to a favourable context that triggered positive mechanisms supportive of building organisational and workforce oral healthcare capacity. At Time 2, an alternative program theory of how the intervention has unfolded in practice described a changed context following the withdrawal of the project facilitation processes with the triggering of alternative mechanisms that have made it difficult for staff to embed sustainable practice.

Conclusion: Findings concur with the literature that successful implementation outcomes do not necessarily guarantee sustainability. The study has provided a deeper explanation of how contextual characteristics have contributed to the conceptualisation of oral healthcare as a low priority, basic work-ready personal care task and how this, in turn, hindered the embedding of sustainable oral healthcare into routine community aged care practice. This understanding can be used to better inform the development of strategies, such as multi-level facilitation, needed to navigate contextual barriers so that sustainable practice can be achieved.

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* Corresponding author.

E-mail addresses: adrienne.lewis@sa.gov.au, adrienne.lewis@adelaide.edu.au (A. Lewis), gillian.harvey@adelaide.edu.au (G. Harvey), mehogan@helpinghand.org.au (M. Hogan), alison.kitson@flinders.edu.au (A. Kitson).

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What is already known about the topic?

- Various stand-alone interventions have attempted to improve oral health for older people. While short-term improvements in

oral healthcare have been demonstrated, long-term sustainability has been unsuccessful.

- Successful implementation of an intervention does not necessarily guarantee sustainability.

What this paper adds

- Increases the understanding of contextual characteristics that undermine efforts to improve oral healthcare for older people and informs the development of tailored strategies to better support the embedding of oral healthcare into routine practice.
- Contributes to the development of methodologies that can be applied to evaluate sustainability in healthcare.
- Corroborates that sustainability evaluation should ideally be built into the life-cycle of all healthcare improvement projects.

1. Background

Despite overwhelming evidence that good oral health is essential for healthy ageing, it has been described as one of the most neglected aspects of care experienced by older people (Coker et al., 2016; Sloane et al., 2013; World Health Organisation, 2015). The aged care sector's lack of insight into the high-risk consequences of poor oral health (such as; malnutrition, poor diabetic control, stroke and cardiovascular problems, aspiration pneumonia and bacteraemia) perpetuates this neglect (De Lugt-Lustig et al., 2013; De Visschere et al., 2015; Knevel et al., 2016). This includes aged care staff underestimating the significance of oral healthcare as an effective, low cost infection control intervention (Thorne et al., 2001). Inadequate oral health content in entry-level nursing and aged care qualifications has been cited as a contributing factor (Hopcraft et al., 2010; Lewis et al., 2018). Similarly, older people and their families who accept that deteriorating oral health is a natural consequence of ageing, unknowingly contribute to the misconception that it takes a lower priority over other aspects of care (Slack-Smith et al., 2010; Nogueira et al., 2017).

Improving the oral health of older people has been the focus of two Australian Government funded projects led by the South Australian Dental Service under a program called Encouraging Better Practice in Aged Care. A project called Better Oral Health in Residential Care (2007–2009) demonstrated oral health improvements for residents by promoting a multidisciplinary model incorporating oral health assessment, oral healthcare planning, actioning daily oral care, and referral for dental treatment (Fricker and Lewis, 2009). In 2010, this was disseminated as a national one-off 'train the trainer' program under Australia's first Nursing Home Oral and Dental Health Plan. A second project called Building Better Oral Health Communities (2012–2014) followed. Its aim was to translate the residential aged care approach to suit the community aged care (known as home care) context through a model called Better Oral Health in Home Care (Lewis et al., 2016).

While the one-off national 'train the trainer' program was successful in raising the profile of oral health in residential aged care, learnings have since highlighted that improving oral health care for older people involves more than staff education (Goodman et al., 2016; Wårdh et al., 2012; Villarosa et al., 2018). Contemporary literature on implementation science corroborates this proposing it is the interaction of multi-level factors such as the nature of the evidence, the context in which the evidence is introduced, and the way in which the implementation process is facilitated, that influence an organisation's capacity to successfully absorb and sustain knowledge use (Kitson et al., 1998; Rycroft-Malone et al., 2011). Subsequently, the Building Better Oral Health

Communities Project used a conceptual framework called Promoting Action on Research Implementation in Health Services to guide the Better Oral Health in Home Care Model's implementation into community aged care practice (Lewis et al., 2016). However, while the project demonstrated successful implementation outcomes, the extent to which the Better Oral Health in Home Care Model has been embedded into sustainable routine practice was unknown.

1.1. Sustainability

While sustainability is recognised as the logical endpoint of the implementation process, it is poorly defined in the literature with no agreed-upon definition, theories or models to guide its practice (Scheirer, 2013; Wiltsey Stirman et al., 2012). The literature generally refers to the seminal work of Shediac-Rizkallah and Bones (1998), and Scheirer (2005) who have conceptualised sustainability as consisting of three levels of operational outcomes: individual, organisational and community (Wiltsey Stirman et al., 2012). Individual outcomes refer to the continued benefits for clients after the initial program funding ends or following the initial implementation of a new program or procedure (Scheirer, 2005, 2013). Organisational outcomes, often called institutionalisation or routinisation, are the continuation of the program activities (Scheirer, 2005, 2013). Community outcomes represent the continued capacity to deliver program activities following the initial program's capacity-developing processes (Scheirer, 2005, 2013). Further to this, is the understanding that sustainability is influenced by multi-level factors such as the nature of the context (policies and legislation, culture and structure), the nature of the evidence or innovation (its fit, adaptability and effectiveness), processes (fidelity monitoring, evaluation, efforts to align the intervention with the context), as well as, the capacity to sustain (funding resources, workforce characteristics and stability, and interpersonal processes) (Wiltsey Stirman et al., 2012, p. 9). While successful implementation is an important achievement, it is acknowledged that this does not necessarily guarantee sustainability. A recommended final step in the life-cycle of any healthcare project is the assessment of its sustainability two or more years following its implementation (Wiltsey Stirman et al., 2012).

A theory gaining popularity in explaining how sustainability takes place in healthcare is Normalisation Process Theory. Normalisation Process Theory is described as a social action theory that uses four reciprocal core constructs (coherence, cognitive participation, collective action and reflexive monitoring) to describe the processes by which interventions become embedded (or not) into routine healthcare delivery (May et al., 2007, 2009; Johnson and May, 2015). Coherence or sense making refers to what staff, either individually or collectively, do when faced with operationalising a new intervention into routine practice. This involves staff understanding the aims and benefits of the new intervention and how it is supposed to work, as well as, understanding their role and responsibilities (May et al., 2007, 2009). Cognitive participation or engagement refers to the work that defines and organises staff to build and maintain a practice network around the new intervention (May et al., 2007, 2009). This includes whether key staff members have continued to facilitate the new intervention so that staff remain engaged and support the actions and procedures needed to sustain it as an embedded routine practice (May et al., 2007, 2009). Collective action refers to the work that staff do to operationalise the new intervention into every day routines. This includes staff feeling accountable and confident in themselves and each other as they use the new intervention. This is underpinned by the skill-set of staff members and includes managing the new practice using various resources, protocols, policies and procedures (May et al., 2007, 2009). Lastly, reflexive monitoring refers to the appraisal work that staff

members undertake to define and manage the information needed to evaluate the outcomes of operationalising the new intervention (May et al., 2007, 2009). This includes systematically collecting information by formal and/or individual appraisal such as regular auditing and risk management processes.

In terms of understanding theories of behaviour change maintenance, Normalisation Process Theory recognises the importance of supportive environments and positive social influences in maintaining behaviour change (Kwasnicka et al., 2016). It describes social change as a three-stage process (implementation, embedding and sustaining), highlighting that the ability to integrate practices into a social context is key to maintaining staff behaviour (Kwasnicka et al., 2016). This concurs with a recent theory-led overview of systematic reviews by Johnson and May (2015) who examined the types of interventional strategies (such as; persuasive, educational and/or information, action and monitoring) most likely to produce sustained behaviour change. Strategies focussing on action, supported by educational input (such as; audit, feedback, reminders, educational outreach), were considered to be the most effective ways of maintaining staff behaviour (Johnson and May, 2015). These approaches were found to contribute to normative restructuring of practice; relational restructuring (with a focus on collective rather than individual action); modifying of peer group norms and expectations; and the continued reinforcing of modified peer group norms (Johnson and May, 2015). With regards to Normalisation Process Theory, this suggests that interventions that act through the constructs of collective action and reflexive monitoring are most likely to maintain changes in staff behaviour (Johnson and May, 2015).

Normalisation Process Theory, therefore, was used in this study as a mid-range theory to explain how staff have embedded (or not) the Better Oral Health in Home Care Model into routine practice. Consistent with the need to understand the complexity of multi-level influences on sustainability, including the mediating effect of context, a Realist Evaluation approach was applied to Normalisation Process Theory. Realist Evaluation employs a systematic investigative structure described as context-mechanism-outcome

configurations to form explanations that go beyond determining whether the implementation of an intervention was successful (or not). The aims of Realist Evaluation are to consider what mechanisms have been generated, how they are influenced by contextual factors, and how they affect ongoing outcomes (Pawson and Tilley, 2013). When compared with other scientific paradigms, a realist approach offers this study a theoretically driven methodology with which to retrospectively and prospectively explore the interplay of Normalisation Process Theory core constructs in terms of mechanisms, context and outcomes that may have supported or hindered the embedding of the Better Oral Health in Home Care Model into routine practice.

1.2. Objective

The aim of this study was to evaluate the embedding of sustainable oral healthcare for older people into routine community aged care practice.

The objectives were to:

- 1 Review how the Better Oral Health in Home Care Model was designed to work.
- 2 Apply the Normalisation Process Theory core constructs as a framework with which to investigate how the Better Oral Health in Home Care Model has or has not been operationalised as intended by comparing two timeframes: Time 1 (Implementation June 2012–December 2014) and Time 2 (Post-implementation July 2017–July 2018).
- 3 Explain what mechanisms helped or hindered the use of the Better Oral Health in Home Care Model.
- 4 Explain what contextual characteristics supported or undermined the embedding of the Better Oral Health in Home Care Model via their influence on the identified mechanisms.
- 5 Describe the outcomes for home care clients resulting from the interaction between the identified mechanisms and contextual characteristics.

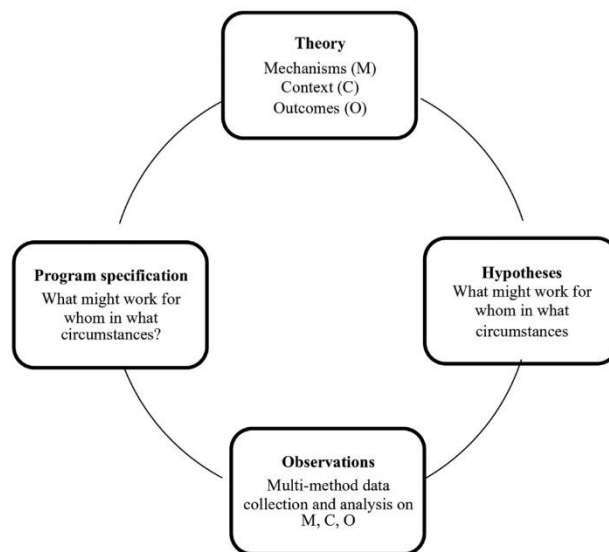


Fig. 1. Realistic Evaluation cycle.

1.3. Ethical approval

The study was approved by the University of Adelaide Human Research Ethics Committee (number H2016-276).

2. Methods

2.1. Study design

A qualitative approach was used based on a single case study with two subcases reflecting different contextual settings. The study design followed the recommended phases of the Realist Evaluation cycle (Pawson and Tilley, 2013, p. 85) and the reporting standards for Realist Evaluation (Wong et al., 2016). The Realist Evaluation cycle (Fig. 1) begins with the conjecture of possible context-mechanism-outcome configurations (referred to as the initial program theory) most likely to be active in the program or intervention being studied (Lacouture et al., 2015; Pawson and Tilley, 2013). Context-mechanism-outcome configurations represent the hypothesis that the program outcome emerges because of the action of an underlying mechanism which comes into operation only in a specific context (Pawson and Tilley, 2013). The hypothesis is further clarified through data collection and analysis of the question of what might work for whom in what circumstances, how and why. This information is used to describe alternate context-mechanism-outcome configurations to the initial program theory by developing what is referred to as a refined or alternate program theory. A key distinguishing feature is that a mechanism is not an intervention or activity, but rather, it is what makes an intervention work or not work by interacting with an individual's reasoning to trigger a change in behaviour (Astbury and Leeuw, 2010; Williams et al., 2017). A mechanism therefore, is not directly visible or measurable but must be inferred from the collected data (Astbury and Leeuw, 2010).

2.2. Context

The immediate context of the evaluation consisted of a large not-for-profit aged care provider. Established in the 1950s, it oversees residential care, retirement living, community home care and home support services across metropolitan and regional South

Australia. The invitation to participate in this study was based on its past involvement as a collaborating partner with the South Australian Dental Service in the Building Better Oral Health Communities Project (2012–2014) and the previous Better Oral Health in Residential Care Project (2007–2009). Two community service sites were involved. One was metropolitan situated in the northern suburbs of Adelaide and the other was a country site that covered a large geographical region in the north of South Australia.

2.3. Recruitment

Purposeful sampling of participants from corporate, management and direct care staff positions including consumer representation, took place from both metropolitan and country sites. A liaison person from the participating provider distributed written information inviting potential participants to join the study. Contact details were given to the primary researcher (AL) following participant approval to be contacted. The initial plan was to recruit up to 16 participants as this sample size was considered adequate for the case study design. While a timeframe of six months had been allocated, it took over eight months to recruit 14 participants, with several follow-up invitations made during this time. Reasons for the slow response rate related to staff being preoccupied and/or unwilling to participate due to competing pressures such as work place restructuring and/ or other project commitments.

2.4. Data collection

Data were collected from 14 semi-structured interviews conducted by the primary researcher (AL) either face to face or by telephone and digitally recorded. The interview question guidelines have been included as supplementary information (Supplementary File 1). Interviews took place at a time and location convenient to the participant and lasted approximately 30 min with written consent obtained prior to the interview. A documentary review was also undertaken.

Supplementary File 1: Interview question guidelines

2.5. Data analysis

Qualitative data analysis employed a thematic approach (Fig. 2) combining retrospective and prospective approaches (Rycroft-

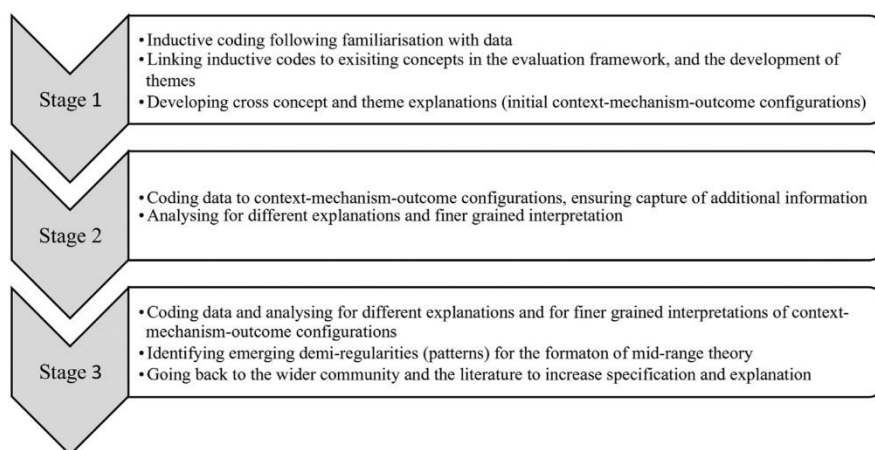


Fig. 2. Stages of analysis.

Malone et al., 2016, p. 5). Stage one used the Better Oral Health in Home Care Model implementation outcomes (Lewis et al., 2016) as data to describe how the Model was designed to work at Time 1. Analysis consisted of retrospective reflection using Normalisation Process Theory core constructs to describe possible context-mechanism-outcome configurations and the initial program theory. Stage two consisted of investigating how the Better Oral Health in Home Care Model unfolded in the community aged care context at Time 2. This involved comparing the original design with how the Model has been used in actual practice. Data collected from the interviews were transcribed verbatim and entered into a qualitative software program (NVivo pro-11) for coding. Data analysis involved an iterative process using a combined inductive and deductive approach to assign data to the most relevant Normalisation Process Theory theme or code. Stage three finalised the prospective construction of alternate context-mechanism-outcome configurations and developed an alternate program theory describing how the Better Oral Health in Home Care Model has unfolded in practice.

The data trustworthiness was enhanced by obtaining interview data from the perspectives of various levels of staffing (corporate, managerial, clinical and direct care staff) including consumer representation from the metropolitan and country sites. Input from three researchers (MH, an aged care representative; GH and AK, experts in implementation science and realist evaluation), was used to verify the primary researcher's (AL) data interpretation. This involved AL, MH, GH and AK separately reviewing randomly selected interview transcripts with any differences in the coding resolved through discussion. Finally, an interpretative meeting with a group of staff interviewees was held to check whether the data analysis matched their understanding of actual practice and, in doing so, provided the opportunity for further data analysis confirmation through discussion and challenge.

3. Results

Normalisation Process Theory's core constructs were used as a framework (Fig. 3) with which to compare the context-mechanism-outcome configurations of the initial program theory at Time 1, with those of the proposed alternate program theory at Time 2.

3.1. Initial program theory

3.1.1. Coherence

Staff participated in face to face training using the learning and training package specifically tailored to suit their learning needs. Home care workers reported significantly improved oral health knowledge and skills following their training and were highly positive of the learning and training package and (Lewis et al., 2016).

3.1.2. Cognitive participation

Organisational engagement was achieved by high-level corporate commitment to participate in the implementation of the Better Oral Health in Home Care Model. This included management representation on the project Steering Committee; the secondment of staff members as project offices (local facilitators) mentored by the public dental provider project team and an academic expert (external facilitators); and the participation of home care workers in reflective practice sessions included as part of the learning and teaching package (Lewis et al., 2016).

3.1.3. Collective action

Multi-level facilitation was identified as instrumental in the successful development and implementation of tailored strategies highly conducive to the community aged care context (Lewis et al., 2016). This involved the development of capacity building networks mentored by local and external facilitation processes, supported by the

Coherence	Context	Mechanism	Outcome
Time 1	Delivery of learning and teaching package tailored to suit the needs of staff	Increased home care worker understanding of how to provide evidence-based oral healthcare	<ul style="list-style-type: none"> Older people reported better oral health
Time 2	No further staff training with consumers considered responsible care choices	Assumption that older people have adequate oral healthcare literacy	<ul style="list-style-type: none"> Home care clients may unknowingly be making uninformed oral healthcare choices
Cognitive Participation	Context	Mechanism	Outcome
Time 1	Government grant funding provided project resources	Organisational engagement	<ul style="list-style-type: none"> Organisational commitment to implement the Better Oral Health in Home Care Model. Active oral healthcare facilitation
Time 2	Withdrawal of project resources supportive of local and external facilitation	Organisational disengagement	<ul style="list-style-type: none"> Loss of organisational commitment Loss of active oral healthcare facilitation
Collective Action	Context	Mechanism	Outcome
Time 1	Active local and external facilitation	Active participation by staff	<ul style="list-style-type: none"> Provision of community aged care prevention and early detection of oral health problems
Time 2	Competing project demands	Adoption of a project mentality	<ul style="list-style-type: none"> Reduced staff capacity to engage in the collective action needed to embed the Better Oral Health in Home Care Model
Reflexive Monitoring	Context	Mechanism	Outcome
Time 1	Staff undertaking oral health assessment and reporting of poor oral health	Auditing of oral healthcare	<ul style="list-style-type: none"> Staff able to identify clients in need of dental care Client opportunity to access a priority dental referral pathway Home Care Standards referral obligations met
Time 2	Oral health assessment and care guidelines removed from organisational documentation	Belief that oral health is not a clinical and/or infection risk	<ul style="list-style-type: none"> No monitoring of oral health outcomes Client opportunity to use priority public dental referral pathway not utilised Home Care Standards referral obligations not met

Fig. 3. Comparison of the context-mechanism-outcome configurations of the initial program theory of the Better Oral Health in Home Care Model at Time 1 with those of the proposed alternate program theory at Time 2.

introduction of the Better Oral Health in Home Care Model recommendations and guidelines into organisational documentation.

3.1.4. Reflexive monitoring

An oral health assessment tool easily understood by non-clinical care coordinators and oral health reporting guidelines for care workers were introduced to increase staff's ability to identify clients in need of oral health care support and dental referral. This included access to a priority public dental referral pathway that linked well with the aged care provider's Home Care Standards referral obligations (Lewis et al., 2016).

3.2. Alternate program theory

At Time 2, broader changes in the community aged care context were indicative of a more streamlined and competitive market-based aged care sector. Since 2012, the community aged care sector has experienced high consumer demand for Home Care Packages with a rapid increase in the numbers and specialisation of home care and/or home support providers in community aged care. At the same time, there has been a 13% reduction in the estimated size of the community aged care workforce with recruitment of staff in regional and rural areas described as difficult (Mavromaras et al., 2017). Since Time 1, the community aged care workforce has become older with a mean age of 52 years old. National census data also reported that care workers receive less work-related training compared to other occupations working in the community aged care sector (Mavromaras et al., 2017). A forthcoming change, likely to impact on home care compliance obligations, is the introduction of a single set of Aged Care Standards for residential aged care and home care providers (Australian Government Department of Health, 2017a, 2017b). Furthermore, Australia's national oral health plan continues to advocate for a multidisciplinary approach to oral health assessment and support for the maintenance of daily oral care with improved access to timely dental care for older people (National Advisory Committee on Oral Health, 2004; Council of Australian Governments (COAG) Health Council, 2015). It is acknowledged that eligibility for public dental care in Australia stipulates an adult be a holder of a government concession card. In South Australia, a client co-payment is applied for adults with access to priority dental referral available for home care clients of the participating provider, through a South Australian Dental Service funded Community Aged Care Program.

Of the 14 participants recruited for this study at Time 2, 12 were staff and two were consumers. Most staff members were female. Staff credentials ranged from certificate III (Aged Care) for care workers and care coordinator through to nursing, social work and business qualifications for clinical, management and corporate staff. Staff participants were generally long-term employees, many of whom had been working for the aged care provider during the implementation of the Better Oral Health in Home Model. Some of them had been involved as project officers and/or members of the project Steering Committee (local facilitators) and were known to the primary researcher (AL), however, no ongoing interaction had taken place between time-points of 1 and 2. The consumer representatives were male with one on a high care level four Home Care Package, and the other receiving low care from the Commonwealth Home Support Programme.

3.2.1. Coherence

High staff turnover was described as a challenge with staff recruitment in regional and rural areas reported as difficult.

'The biggest challenge for us would be around staffing, we have huge challenges around getting staff and retaining staff especially in your remote regional area.' (Interview 5)

Staff consistently described oral healthcare as a basic personal care task and referred to it as an expected work-ready skill.

'A care worker should know that personal care includes oral health.' (Interview 3)

'We assume that the staff that we employ have a set of skills and knowledge that they bring to their roles.' (Interview 10)

No facilitated staff training using the Better Oral Health in Home Care training package had taken place since Time 1, but links to the Better Oral Health in Home Care resources were found on the organisation's intranet.

'No, we haven't done anymore oral health training, because we haven't really done a lot of training, we just don't have the money to pay staff to do that.' (Interview 7)

Oral health information was not included in the staff induction nor was it included in mandatory training. Care worker meetings, that usually included some form of training, had been reduced from about five to two times a year. Cost had played a factor in this change. An elective online oral hygiene training program (separate to the Better Oral Health in Home Care training package) had been available, but the organisation had recently stopped funding this. Staff training records indicated that very few staff had participated in this type of training. It was reported that staff were generally unaware of the training resources and/or they could not easily access computers to use it.

'A lot of our care staff don't access the intranet, they find it difficult to from home or they can't and most of them don't come into the office or if they do they are only here for a short time. So, they aren't actually able to engage with that sort of stuff.' (Interview 7)

Heightened awareness of the high-risk consequences of poor oral health and the understanding of how the Better Oral Health in Home Care Model was intended to work came from staff who had either participated in the project as local facilitators, attended the project training or held a nursing qualification.

'Staff who did the training were quite surprised at the impact that bad oral hygiene could have on somebody's health. They knew it could impact on their health, but they didn't really understand quite how much.' (Interview 8)

'The nurses are probably, the only ones that would ask a question about oral health.' (Interview 3)

Clients and their families reported that they did not recall having discussions about oral healthcare with staff nor were they informed that they could access priority dental treatment if they were eligible for public dental care.

'My parents are community clients and I'm pretty sure that nobody's ever asked them how they manage their dental health.' (Interview 10)

Furthermore, clients described that more urgent and competing health problems had a higher priority over dental care.

'It hasn't been a subject that I've really had come up because that's not where we've had all the problems' . . . no, I haven't had anything.' (Interview 15)

There was also the belief that oral health education should be directed at the consumer, rather than staff, as the client was the one responsible for their care and service choices.

'Focus on education for the consumer. Because at the end of the day it's the consumer that has to say, yes, I will pursue this.' (Interview 3)

It appeared that nurses and staff working in respite care were most likely to use the Better Oral Health in Home Care consumer oral health resources (such as bathroom prompts) to educate

clients. Staff from the country site referred to the occasional inclusion of oral health reminders in consumer newsletters. There was also a general assumption that the dental sector was responsible for consumer oral health education.

3.2.2. Cognitive participation

In terms of cognitive participation or engagement, staff appreciated the benefit of having people belonging to the organisation involved in the facilitation of new projects and/or interventions. This in conjunction with corporate and managerial level commitment, were considered to be important elements for the sustainability of project outcomes, rather than, relying on one-off training approaches.

'I think you certainly need to have someone probably locally driving it . . . You have to have, you know, someone that's passionate and dedicated, but then you have to have someone that's going to continue on with that, with that role.' (Interview 4)

Of the key corporate, managerial and care coordinator staff involved as local facilitators during Time 1, while some had left the organisation, those remaining worked in other positions. None of the remaining staff saw it as their role to continue to facilitate and engage with staff in the operationalization of oral healthcare for clients.

'We might do all the work behind the scenes, do the consultation, get them out there, get them endorsed, get them on the internet but we're not really responsible for monitoring the implementation.' (Interview 10)

Descriptions of how the Better Oral Health in Home Care Model unfolded in practice between time-points 1 and 2, confirmed that care coordinators were responsible for setting-up client plans and for deciding whether further referrals (such as nursing or dental) were required.

'The packages may or may not see a nurse. It is actually the intake team, the service co-ordinators, who will set that up. They have reasonable awareness about things to set up; they know that they can refer the package clients to the dental clinic.' (Interview 3)

Staff repeatedly referred to the consumer as ultimately responsible for their care and service choices.

'At the end of the day, community clients are the drivers of their own care packages.' (Interview 10)

3.2.3. Collective action

A consequence of the competitive open-market environment was the pressure on the organisation to be innovative.

'We went from sort of cottage industry into being business unit, so we became businesses but now almost in the open-market environment and I don't think anyone's ever had such a massive shift . . . So, we've been forced into a model where we're commercialising all of our products and trying to find innovation so that we can sell and, I suppose, exploit the market.' (Interview 1)

Staff provided many examples of projects describing that their attention constantly moved from one project to another.

'What happens is there's one project, and everyone is go, go, go. And then the next project comes along and that one sort of slips behind, so it's hard to keep the motivation going right the way through.' (Interview 2)

There was also a general assumption by staff that a project's sustainability was guaranteed when it had been incorporated into organisational documentation (such as policies, guidelines, procedures and planning forms). Once in the documentation system it was described as 'law'.

'Sustainability in the longer term . . . I think it has to be actually built in to the guidelines and policies and procedures and that way it's sustained through each individual as they do the work.' (Interview 1)

Post-project document review at Time 2, however, found that a streamlining of processes had taken place in the way oral healthcare was assessed, planned and referred.

'We're looking at changing all of our processes, adapting it to become more efficient in the way we operate.' (Interview 8)

Assessment documentation incorporating the oral health assessment tool introduced as part of the Better Oral Health in Home Care Model was no longer in use. The aged care provider had decided that this information could be obtained by proxy using an external assessment completed by the government aged care assessors. The rationale given for this was to avoid clients undergoing numerous assessments and repeating information. Staff feedback also indicated that the organisation was no longer paid to undertake assessments.

'Because they've already had an assessment through My Aged Care and the regional assessment service, we don't do another assessment when they start with us, we just ask basic questions about their preferences for services and then the review is again very basic questions because we are not funded for that time.' (Interview 7)

As staff did not record dental referral information, it was difficult to ascertain the extent to which care coordinators used the proxy information for the purposes of identifying clients in need of oral health care support and/or dental care.

'I know there's been, you know, a few people that have been referred, but actual numbers, no.' (Interview 3)

South Australian Dental Service records, however, indicated minimal referrals had been made under the priority dental care program since Time 1. These referrals were metropolitan-based with the registered nurse as the main referral source. Staff turnover was given as the reason for this citing that new staff members were unaware of this program. Changes made to the client planning documents also showed an absence of oral healthcare prompts to support the planning process. In addition, it was reported that procedures assumed to be work-ready skills have been removed from guidelines and protocols.

'There are lots of procedures that we've actually done away with because they are actually quite 'tasky' – things like how to wash somebody in bed. Oral healthcare might be one of those things because we assume that the staff that we employ have a set of skills and knowledge that they bring to their roles.' (Interview 10)

3.2.4. Reflexive monitoring

There was consensus from corporate, managerial and direct care staff that they considered maintaining a client's oral health as very important for an older person's quality of life, general health and wellbeing.

'I think it is actually a very critical area that needs to be looked at fiercely because it does affect the, overall the health and wellbeing of the client.' (Interview 5)

In contrast, staff did not consider poor oral health as a clinical and/or an infection risk.

'It's personal care. It's not clinical.' (Interview 10)

Furthermore, staff tended not to report oral health problems and/or infections via the risk management system (called Risk-man).

'It includes things like infections, falls, skin tears, medication incidents, changes in behaviour, those sorts of things. So, we would consider these are outcomes for our clients that we don't

want to have happen. So, we look at those – I look after infections, infection control is my area of moderate expertise. I would look at infections and look for trends and data . . . I cannot really recall seeing mouth infections there.' (Interview 10)

Some staff acknowledged that the forthcoming introduction of new Aged Care Standards would demand more evidence than had been expected in the past, especially with regards to proving the quality of personal care delivery.

'Because the community standards are principles and are really quite vague, and they're really more about access and equity, not so much about service delivery and what does your care plan have in it, and have you met all the hygiene standards and everything else. I'm not quite sure about how we're going to prove we meet those standards.' (Interview 3)

Furthermore, it was identified that the meeting of accreditation standards was a key motivator for managers when it came to identifying items for their continuous improvement plans.

'I think certainly from you know quality improvement point of view, managers and things that can add that to their continuous improvement plans and things like that, and I think it connects to the standards. I think there's certainly a carrot there.' (Interview 2)

4. Discussion

The aim of this study was to evaluate the embedding of sustainable oral healthcare for older people into routine community aged care practice. Sustainability was conceptualised as consisting of three levels of operational outcomes: individual, organisational and community. Normalisation Process Theory core constructs (coherence, cognitive participation, collective action and reflexive monitoring) were applied with Realist Evaluation to investigate how the Better Oral Health in Home Care Model has (or has not) been operationalised as intended by comparing two timeframes: Time 1 (Implementation June 2012–December 2014) and Time 2 (Post-implementation July 2017–July 2018).

At Time 1, a retrospective description of how the Better Oral Health in Home Care Model worked (initial program theory) proposed that Australian Government funding to improve the oral health of people receiving home care created a favourable context in terms of incentive, resources and expertise. Within this favourable context, it was found that an implementation approach guided by the Promoting Action on Research Implementation in Health Services framework, involving multi-level facilitation, was responsive to contextual factors and triggered mechanisms supportive of outcomes such as building the organisational and workforce oral health capacity. This concurs with the findings of the recently revised 'integrated' Promoting Action on Research Implementation in Health Services, identifying facilitation as the key active element supporting an organisation's capacity to successfully implement new innovations (Harvey and Kitson, 2015). Following the withdrawal of multi-level facilitation processes at Time 2, an alternative program theory was identified. Major contextual changes, in the absence of ongoing facilitation, triggered alternative mechanisms that hindered the embedding of sustainable oral healthcare practice. The following interpretation includes metropolitan and country perspectives as little evidence was found to differentiate them.

A lack of staff training in using the Better Oral Health in Home Care resources and a reliance on consumer knowledge was found to contribute to poor coherence. The acceptance of oral healthcare as a basic, personal care task and a work-ready skill made it challenging for staff and older people to conceptualise oral

healthcare as a fundamental aspect of care important for infection control and healthy ageing. Furthermore, the internalisation of oral healthcare as a low priority reduced the level of commitment (organisational and individual) needed to build a shared understanding of the benefits of the Better Oral Health in Home Care Model. Operationalisation was found to be dependent on the care coordinator's level of oral health knowledge and facilitation skills. Consumers were considered responsible for their care choices with staff deferring accountability to the dental sector for consumer education. Furthermore, competing project demands and a related project mentality compromised the capacity of staff to collectively embed the Better Oral Health in Home Care Model into routine practice. The streamlining of assessment, planning and referral processes also impeded the contextual integration of oral healthcare into organisational processes. This presented as a conundrum given the assumption that documentation guaranteed sustainability versus the expectation that irrespective of whether it was documented or not, oral healthcare should be provided. With regards to reflexive monitoring, the belief that oral health was not a clinical and/or infection risk contributed to the practice of not auditing or risk managing oral health. Based on these findings, sustainability, in terms of continued oral health benefits for clients, continued use of the Better Oral Health in Home Care Model, and continued workforce capacity, had not been achieved.

Overall this study provides a deeper understanding of how contextual factors influenced the ability of staff to embed sustainable oral healthcare into routine community aged care practice. From the broader perspective of explaining of how sustainability is achieved, these findings suggest that continued internal facilitation is required to maintain the Normalisation Process Theory core constructs and the ongoing activation of mechanisms supportive of sustainable practice. A key learning from this study has been the recognition that the facilitation of supportive capacity building networks must remain in place following project implementation stage of new interventions so that staff are encouraged and supported to fully embed the new practices into routine care. This ongoing facilitative role could be incorporated into organisational research and development activities, safety and quality processes and/or educator input to oversee the ongoing activities of audit, feedback, and reminders upheld with staff education. This supports the proposition that maintaining changes in staff behaviour is more likely to succeed through the Normalisation Process Theory constructs of collective action and reflexive monitoring (Johnson and May, 2015). Lastly, the study's findings also concur with the literature on sustainability, confirming that successful implementation of an intervention at the completion of a project does not necessarily guarantee sustainability. This serves as a reminder that social change is a three-stage process involving implementation, embedding and sustaining (Kwasnicka et al., 2016). Therefore, assessment of sustainability, two or more years following an intervention's implementation, should ideally, be the final step in the life-cycle of all healthcare improvement projects (Wiltsey Stirman et al., 2012).

4.1. Study limitations, challenges and strengths

There are a number of limitations to this study. Firstly, it was restricted to a single case study based on one large aged care provider out of a group that participated in the original Building Better Oral Health Communities Project. Secondly, recruitment of participants was time-consuming with only a small number of respondents agreeing to take part in the study. The small recruitment numbers may have introduced some bias, but the steps taken to maintain data trustworthiness (such as gaining the perspectives from different

levels of staff, review from three independent researchers and an interpretive meeting with staff) were used to counteract this. Thirdly, the study was primarily focused on oral healthcare and did not take into consideration other aspects of care delivery. Despite these limitations the strength of this study is its novel approach in applying Normalisation Process Theory with Realist Evaluation to better understand the multi-level factors influencing sustainability.

5. Conclusion

In conclusion the application of Normalisation Process Theory with Realist Evaluation has provided a deeper explanation of the contextual factors that contributed to the conceptualisation of oral healthcare as a low priority, basic work-ready, personal care task and how this, in turn, hindered the embedding of sustainable oral healthcare into routine community aged care practice. This understanding can be used to better inform the development of strategies, such as multi-level facilitation, needed to navigate contextual barriers so that sustainable practice can be achieved. Furthermore, the identification of positive and negative mechanisms in this study strongly support the supposition that improving oral health for older people has political and policy implications, signifying the need for greater inter-sectorial collaboration involving aged care, vocational healthcare education, the dental sector and consumer advocacy groups.

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Declaration of Conflicting Interests

The key author of this manuscript is an employee of the South Australian Dental Service and was involved as both an implementer and evaluator of the oral health intervention presented in this paper.

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.ijnurstu.2018.12.016>.

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Supplementary File 1: Interview question guidelines

STAFF

Part 1: Information about the person

1. What is your role in the organisation?
 - How long have you worked in the role?
 - What did you do before this?
2. What is your professional background – only ask if not explicit from comments above
3. Please could you tell me more about what your role involves on a day to day basis
 - Who do you report to?
 - Who reports to you?

Part 2: Awareness, understanding and personal involvement re oral health and older people

1. When did you first become aware of this issue?
2. What if anything, what does being able to improve the oral health for older people mean to you?
3. What do you think it means to the organisation as a whole?

Part 3: Intervention

1. What oral health interventions do you think have been adopted?
2. Do you think any of the resource materials that we developed have been used?
 - Educational materials
 - Oral health assessment, care planning and reporting guidelines
 - Consumer materials

Context

3. How would you describe the context that you work in?
 - Aged care reforms
 - Consumer directed care
 - Safety and quality
 - Home care standards and accreditation reforms
 - How do these affect your ability to implement better oral health care for clients?

Mechanism

4. Do you think involvement in the oral health project has improved client care?
 - Why and how do you think it works?
 - What has helped or hindered its implementation and ongoing operationalisation?

Outcome

5. How do you measure and monitor the impact of oral health care?
 - Data collection
 - Ownership – specific person or group or committee
 - Analysis and reporting
 - How is data collected and reported – to whom, formality and frequency
6. What changes in practice have been encouraged by being involved in oral health project?
7. If you could change anything about the oral health project in any way what would you do?

CONSUMER

Part 1: Information about the person

- Age
- Gender

- Concession care holder
- Type of home care or home support package

Part 2: Information about oral health status

- Do you have natural teeth or dentures?

Part 3: Oral health care support by home care staff

- Have you been asked about your oral health needs? (refer to questions from assessment tool)
- Do you need support with your oral healthcare?
- If yes, what type of help do you need? (for example, help with care or help with transport to dentist)
- Have you been provided with any information (verbal or booklet/bathroom prompt) on oral healthcare?
- If yes, what type of advice have they given you? (for example, name some of the Better Oral Health in Home Care recommendations)
- When was the last time you saw a dentist? (for example, was it for a check-up or an emergency appointment)
- If eligible for public dental care, do you know about the South Australian Dental Service priority referral?

CHAPTER 9: DISCUSSION AND CONCLUSION

This final chapter provides an analysis of the aims and findings of the thesis, highlighting the theoretical and practical contributions of the research. It also includes consideration of the study's limitations, and implications for future research and practice.

9.1 Analysis of aims and main findings

Robust evidence demonstrates that good oral health is essential for healthy ageing, yet oral health is described as one of the most neglected aspects of care experienced by older people (Coker et al. 2016; Sloane et al. 2013; WHO 2015). Although various interventions have demonstrated short-term improvements in oral healthcare, their long-term sustainability has been elusive (Ástvaldsdóttir et al. 2018; Villarosa et al. 2018). The aim of this thesis was to better understand these issues by exploring the factors that influenced the implementation and sustainability of an evidence-based intervention BOHHC, which aimed to improve oral health outcomes for older people receiving home care.

The thesis identified a range of multidimensional contextual factors. These included the changing health and oral health profiles of an ageing population; the influence of aged care reforms; access to public dental care; characteristics of the home care and home support workforce; oral health as a fundamental of care; gaps in aged care workforce oral health knowledge and skills; and the need to strengthen the oral health content of entry-level nursing and aged care qualifications. The processes of implementation and sustainability of the BOHHC model, as part of routine home care, subsequently involved a highly complex context with many stakeholders across micro, meso and macro levels of practice. Given this complexity, a realist approach informed the selection of a range of frameworks, theories and models (PARIHS, NPT, RE and the Kirkpatrick model) used in this thesis. In keeping with the realist methodology, a mixed method case study approach was used to explore what worked for whom, how, why and in what circumstances (Miller & Tsang 2010; Stiles 2003; Wand et al. 2010). This research was undertaken as three interrelated elements of inquiry, reported on in three publications, with the main results and conclusions summarised in Table 9.

Table 9: Summary of main results and conclusions

Publication 1	Publication 2	Publication 3
<p>Title ‘Improving oral health for older people in the home care setting: An exploratory implementation study’</p>	<p>Title ‘Evaluating student learning outcomes in oral health knowledge and skills’</p>	<p>Title ‘Can oral healthcare for older people be embedded into routine community aged care practice? A Realist Evaluation using Normalisation Process Theory’</p>
<p>Aim Study aimed to explore how home care providers can support older people to maintain good oral health through appropriate assessment, care plan development, service delivery and referral to dental care by:</p> <ul style="list-style-type: none"> • using the Promoting Action on Research Implementation in Health Services framework to optimise transfer of the model of oral health care used in residential aged care to suit the home care context • describing older people’s levels of oral health improvement following implementation of this model. 	<p>Aim Study aimed to evaluate the relevance of the BOHHC learning and teaching package for three different student groups that were yet to enter the aged care workforce.</p> <p>These groups included: students undertaking a Bachelor of Nursing in order to become registered nurses; students undertaking a Diploma of Nursing in order to become enrolled nurses; and students undertaking a Certificate III in Aged Care in order to become aged care workers.</p> <p>Using the Kirkpatrick model of learning and training, the objectives were to evaluate whether:</p> <ul style="list-style-type: none"> • students found the resources relevant to their learning needs • resources increased the oral health knowledge and skills of students • educators teaching these students found the resources to be relevant to the teaching of oral health as one of the fundamentals of care. 	<p>Aim Study aimed to undertake a Realist Evaluation exploring the embedding of sustainable oral healthcare for older people in routine home care practice by:</p> <ul style="list-style-type: none"> • reviewing how the BOHHC model was designed to work • using the Normalisation Process Theory core constructs as a framework with which to investigate how the BOHHC model had or had not been operationalised as intended by comparing two timeframes: Time 1 and Time 2 • determining what mechanisms helped or hindered its use • explaining what contextual characteristics supported or undermined its use via their influence on the key mechanisms • describing the possible outcomes for home care clients resulting from the interaction between the identified mechanism and contextual characteristics.
<p>Design The Promoting Action on Research Implementation in Health Services framework informed the implementation of the BOHHC within a case study of four home care provider sites (involving three different aged care organisations) delivering a range of home care and home support services to non-Indigenous and Indigenous clients situated in metropolitan, regional and country locations in South Australia and New South Wales.</p>	<p>Design Kirkpatrick’s training and evaluation model was used to evaluate the BOHHC learning and teaching package within a case study of one university and one large government vocational education provider, both located in South Australia.</p>	<p>Design A Realist Evaluation applying Normalisation Process Theory within a case study of one home care provider organisation (involving two sub-cases: metropolitan and country sites) delivering home care and home care support services to mainly non-Indigenous clients in South Australia.</p>

<p>Method A mixed method, pre- and post-implementation study.</p> <p>Data were collected from older people who undertook an oral health assessment and completed pre- and post-intervention questionnaires on oral hygiene and dental treatment. Home care staff completed pre- and post-intervention questionnaires on oral health knowledge and a questionnaire on the oral health learning and teaching package.</p> <p>Quantitative data were analysed using descriptive and inferential statistics. Qualitative analytical methods were used for process analysis.</p>	<p>Method Data were collected from students who used the resources as prescribed study materials and completed pre- and post-intervention questionnaires specifically designed for this study.</p> <p>Educators were interviewed to obtain their feedback.</p> <p>Quantitative data were analysed using descriptive and inferential statistics. Qualitative data were thematically analysed according to relevance to learning, presentation style and interest.</p>	<p>Method Qualitative methods were applied in two subcases, reflecting different contextual settings.</p> <p>Data were collected via semi-structured interviews and analysed deductively by applying the Normalisation Process Theory core constructs (with the recommended phases of the realist evaluation cycle).</p> <p>Retrospective and prospective analytical methods were used to investigate how the intervention was operationalised by comparing two timeframes: Time 1 and Time 2.</p>
<p>Participants 319 out of 608 eligible older people consented to participate, with 146 completing the project.</p> <p>179 out of 250 staff completed the learning and teaching package.</p>	<p>Participants Out of the 204 students, 124 completed the evaluation. Six nurse educators (two educators from each of the courses of study) also participated in the evaluation.</p>	<p>Participants Twelve staff members were recruited from corporate, management and direct care positions. Two consumers representing high and low care recipients also participated.</p>
<p>Results High levels of dental need were identified.</p> <p>Improvements in older people's oral health were reported following the development of tailored home care strategies to build the oral health capacity of home care organisations and workers.</p>	<p>Results Evaluation showed high levels of student and educator satisfaction.</p> <p>Student learning outcomes demonstrated consistently positive attitudes and significant self-reported improvements in oral health knowledge and skills.</p> <p>Irrespective of course type, students gained similar levels of oral health knowledge and skills following use of the resources.</p>	<p>Results At Time 1, the initial program theory proposed that multi-level facilitation contributed to a favourable context that triggered positive mechanisms supportive of building organisational and workforce oral healthcare capacity.</p> <p>At Time 2, an alternative program theory of how the intervention had unfolded in practice described a changed context following the withdrawal of the project facilitation processes with the triggering of alternative mechanisms that made it difficult for staff to embed sustainable practice.</p>
<p>Conclusion The BOHHC model provided a quality improvement framework for community-based prevention and early detection of oral health problems.</p> <p>Improving oral health for older people in the home care setting has practice and policy implications that require ongoing inter-sectorial facilitation involving the aged care, vocational health education and dental sectors.</p>	<p>Conclusion Nurses and care workers must be able to provide consistent standards of oral health care as a fundamental part of caring for patients.</p> <p>Validated as an effective learning and teaching package, it is recommended that these resources be utilised to strengthen the oral health content of entry-level nursing and aged care qualifications.</p>	<p>Conclusion Findings concur with the literature that successful implementation outcomes do not necessarily guarantee sustainability.</p> <p>The study provides a deeper explanation of how contextual characteristics contributed to the conceptualisation of oral healthcare as a low priority, basic work-ready skill and personal care task, and how this, in turn, hindered the embedding of sustainable oral healthcare in routine community aged care practice.</p> <p>This understanding can be used to better inform the development of strategies, such as multi-level facilitation, needed to navigate contextual barriers so that sustainable practice can be achieved.</p>

Given the majority of literature investigating the neglect of older people's oral healthcare is based on studies conducted in residential aged care settings, this study makes a unique contribution by using a realist approach to deepen the understanding of how contextual factors in the home care setting trigger mechanisms conceptualising oral healthcare as a low priority, basic work-ready skill and personal care task. In doing so, it contributes to the body oral healthcare evidence concerning older people, and advances research on the fundamentals of care. The conjecture of possible CMOs most likely to be active in the delivery of oral healthcare may also enhance the understanding of why other elements of fundamental care may be overlooked as essential aspects of care. This new knowledge, therefore, led to the development of better-informed strategies to navigate contextual barriers, such as the mechanistic 'task and time' service approach described by Kitson and colleagues (2014), and, in doing so, facilitate the mediation of contextual factors that trigger mechanisms supportive of person-centred care. This is particularly relevant to understanding how to mediate factors within the home care context so that home care workers have the ability to connect with older people in a meaningful way, and to understand that oral healthcare is more than the completion of a task or the delivery of a service, but, importantly, requires the integration of interpersonal interactions that are contingent on the person's self-care ability and the involvement of others such as the older person's family (Kitson 2016; Kitson et al. 2014). Furthermore, the validation of the BOHHC learning and teaching package as relevant for home care staff and students of entry-level nursing and aged care qualifications contributes to the development of care literacy products (Kitson 2016) that can be used to help nurses and care workers support older people (and their families) to care for themselves in more effective ways. With regard to how activities are identified as fundamentals of care, this study recommends that oral healthcare should be recognised as an activity in its own right by highlighting its significance as an important infection control intervention that is essential to good health and healthy ageing. Its current position, as a subset hidden within personal cleansing and dressing, may inadvertently reinforce the assumption that oral healthcare should be accorded lower priority over other activities, thus perpetuating the neglect of oral healthcare.

In hindsight, it can be seen that until the Building Better Oral Health Communities Project (2012–2014), public dental provider and aged care projects, such as Better Oral Health in Residential Care (2007–2009), were predominantly outcomes focused (reporting the numbers of dental referrals, numbers of clients treated, types of dental services provided and the cost of dental care). Coupled with this was a taken-for-granted assumption that successful project outcomes lead to sustainable changes in practice. This is suggestive of underlying positivist assumptions, and a lack of awareness of the processes of KT, which appears to be replicated in the literature on oral healthcare research. The unquestioned adoption of an outcomes-based approach is often described as a 'black box' evaluation as conclusions are made

with little explanation or understanding of how the reported outcomes might have been produced (Salter & Kothari 2014). In other words, outcomes-based approaches provide insufficient information about the effectiveness of interventions within uncontrollable, multidimensional contexts (such as those described in this thesis). These studies, in turn, produce insufficient data to inform future implementation efforts (Salter & Kothari 2014). For example, while the one-off national 'train the trainer' program was assumed to have been successful in raising the profile of oral health in residential aged care, research has since highlighted that improving oral health care for older people involves more than relying on short-lived staff education programs (Goodman et al. 2016; Villarosa et al. 2018; Wårdh et al. 2012). Given the substantial government funding that has been invested aged care oral health projects, evidence of whether or not oral healthcare interventions have continued to work as envisaged once project resources are withdrawn has rarely been assessed. Hence, there is a risk of promulgating models of oral healthcare that are unsustainable in real-life aged care contexts, and do not achieve the objective of improving oral health outcomes for older people. In contrast to a 'black box' evaluation, the RE approach used in this thesis offers an alternative 'white box' approach. This not only provided insight into the project interventions' effectiveness, but also explained possible underlying casual mechanisms that provide a generalised explanation of 'what works for whom, how, why and in what circumstances' (Salter & Kothari 2014).

Furthermore, from the perspective of inter-sectorial collaborations, there appears to be a conundrum regarding the dynamics of the power to influence sustainable change and the locus of responsibility when it comes to ensuring the delivery of safe, effective and best practice oral healthcare for older people. For example, once the implementation of a public dental provider and aged care project is over, what then is the role of public dental providers in embedding and sustaining evidence-based oral healthcare in aged care practice? This appears to be problematic given that public dental providers, as external organisations, have little influence over the aged care sector's internal processes. Tentative findings suggest that it would be strategic for public dental providers to invest in the facilitation of macro-level strategies, such as social mass media 'self-care' campaigns and the political lobbying of aged care accreditation agencies. In doing so, it is speculated that macro-level strategies might facilitate the mediation of contextual factors (such as consumer expectations, open market competition among aged care providers, aged care regulation criteria) that could potentially trigger a larger-scale population shift in the understanding of what constitutes as acceptable standards in oral healthcare thus causing a change in aged care practice. In other words, this approach might better support older people to make informed consumer directed care choices when it comes to selecting types of care and service they want from an aged care provider. Ensuring that aged care accreditation criteria reflects evidence-based oral healthcare practice may be another way of incentivising the aged care sector to embed and sustain

the BOHHC model in routine home care practice. Similarly, it is hypothesised that this might lead to higher expectations in terms of employee work-ready skills, thus motivating vocational healthcare education sector to improve the oral healthcare content of entry-level nursing and aged care qualifications. Furthermore, in light of the emerging KT complexity network model (Kitson et al. 2017), questions are raised concerning how the public dental sector might be able to influence KT within the five key sectors (research, education, health, government and community, including industry), and what would need to be done to facilitate more synergy and meaningful collaboration within these sectors to improve the oral healthcare of older people?

9.2 Theoretical contribution

The thesis results concur with the findings of the i-PARIHS framework in identifying that facilitation was a key active element that supported organisational capacity to implement new innovations (Harvey & Kitson 2015). During Time 1, the use of multi-level facilitation, guided by the PARIHS framework, was found to be responsive to contextual factors that triggered mechanisms supportive of successful implementation outcomes, such as building organisational and workforce oral health capacity.

Furthermore, the study demonstrates the benefits of integrating three distinctive facilitator roles (novice, experienced and expert) as a way of building facilitation capacity and strengthening the action of facilitation as described by i-PARIHS (Harvey & Kitson 2015). For example, at Time 1, home care staff members (one per site) were appointed as project officers (2.5 days per week). These staff members (novice facilitators) were subsequently mentored and supported by the candidate (experienced facilitator) and an academic consultant in the PARIHS framework (expert facilitator).

Moreover, the novel approach of applying NPT with RE to better understand the multidimensional contextual factors that influenced sustainability at Time 2 contributes to the development of theory led methodologies that can be used to evaluate sustainability in healthcare. From the perspective of explaining of how sustainability can be achieved, it was identified that active facilitation of contextual factors conducive to triggering mechanisms supportive of embedding and sustaining a new intervention is necessary. Therefore, it is proposed that purposeful multi-level facilitation and recognition of facilitation (role and process) should be considered essential criteria in maintaining the action of the NPT core constructs. As a theory of social action, NPT does not identify a specific agency role in describing how the core constructs of coherence, cognitive participation, collective action and reflexive monitoring are operationalised in the process of maintaining sustainable change. The theoretical contribution of this study, therefore, lies in extending the conceptualisation of facilitation, from being the active element in successful implementation as described in i-PARIHS, to playing an active role in achieving sustainability. This, therefore, substantially changes the nominal nature of facilitation in NPT, as supporting cognitive participation and/or engagement, to one of purposefully assessing, aligning and

integrating the four NPT core constructs. This finding also concurs with the proposition that maintaining changes in staff behaviour is more likely to succeed through strategies (audit, feedback, reminders, educational outreach) that connect with collective action and reflexive monitoring (Johnson & May 2015). Moreover, this supports the view that sustainable behaviour change relates to deliberate changes in structure and action, rather than being dependent on individual staff members' beliefs and/or intentions (Johnson & May 2015). Therefore, while it is acknowledged that facilitation responsibilities may already exist within many staffing roles and organisational processes, formal recognition and authorisation of facilitation (role and process), including the creation of conditions conducive for staff to perform these responsibilities, are constructive ways of achieving this (Berta et al. 2015). In other words, organisations seeking to implement, embed and sustain evidence-based practice need to make a considered commitment to identifying and managing facilitation as a way of promoting and sustaining change (Berta et al. 2015). This serves as a reminder that social change is a three-stage process involving implementing, embedding and sustaining change and that successful implementation of an intervention at the completion of a project does not necessarily guarantee sustainability (Kwasnicka et al. 2016; Wiltsey Stirman et al. 2012).

9.3 Practical contribution

With future estimates that 80% of formal aged care will take place in the home setting, the home care sector is set to play an influential role in helping older people to age well at home (Access Economics 2010; Australian Government Department of Health 2018; National Aged Care Alliance 2014).

Therefore, in light of the growing complexity of older people's oral health profiles, the maintenance of older people's oral health will require a shift from the low priority oral healthcare is currently accorded, to a recognition of its high priority given its relevance to healthy ageing. The care of older people with increasingly complex mouths (increased retention of natural teeth, crowns, bridges and or dental implants), will impose a range of specific care needs, which will require home care staff to have appropriate skills-sets (Forsell et al. 2011a; Forsell et al. 2011b; Knevel et al. 2016; McNally et al. 2012; Sjögren et al. 2009). The 2016 home care and home support workforce survey reported that a much smaller proportion of care workers, compared with workers in all other occupations, undertook any form of training (Mavromaras et al. 2017). It is therefore imperative that the staff training gap between care workers and the rest of the workforce be addressed. Failure to have an appropriately trained home care workforce in oral healthcare will undoubtedly lead to increased health system costs due to the high-risk consequences of poor oral health in older people, such as needless suffering and decreased quality of life and increased risk of serious health conditions (such as malnutrition, poor diabetic control, aspiration pneumonia and bacteraemia), culminating in unnecessary transition into residential aged care and/or

increased the incidence of hospitalisation and premature death (Thorne et al. 2001; Terpenning & Shay 2002; Sloane et al. 2013).

Overall, this study provides a deeper understanding of how contextual factors influence home care staff's ability to embed sustainable oral healthcare in routine home care practice. It recommends that ongoing multi-level facilitation following the implementation of a new intervention be formalised through the home care provider structures responsible for research and development activities, safety and quality processes, and/or staff development educator input to oversee the active linking of the NPT core constructs of coherence, cognitive participation, collective action and reflexive monitoring. Furthermore, this study supports the recommendation that sustainability evaluation should ideally be built into the life cycle of all healthcare projects (Wiltsey Stirman et al. 2012). Specific strategies for improving oral healthcare coherence in the home care setting, therefore, involve encouraging staff educators to use the validated and freely available BOHHC learning and training package. This includes reviewing whether the practice of replacing face to face training with online resources is an appropriate way of meeting the learning needs of home care workers, who are predominantly older staff with lower-level qualifications. For the emerging aged care workforce, using the BOHHC learning and training package to improve the oral health content of entry-level nursing and aged care qualifications is recommended. In relation to consumer directed care, this thesis finds that more needs to be done to improve older people's oral health self-care literacy, and to empower them (and their families) to make informed choices and to be critically discerning of the standard of oral healthcare they receive. And finally, with regard to incentivising reflexive monitoring, it is recommended that contemporary evidence-based knowledge on what represents safe, effective and best practice oral healthcare for older people be used to inform aged care accreditation criteria. In closing, these strategies respond to calls in the literature for multi-level strategies to ensure that the provision of oral healthcare takes place through establishing an enabling environment, a strong sense of organisational responsibility, well-defined reporting and accountability structures, and a workforce that recognises the importance of oral health (de Lugt-Lustig et al. 2013; Dharamsi et al. 2009; Unfer et al. 2012; Weening-Verbree et al. 2013).

9.4 Study limitations

In summary, this thesis can be described as bold, novel and highly exploratory in nature with regard to the unique blending the theoretical frameworks and methodological approaches of PARIHS, NPT, RE and the Kirkpatrick model. Subsequently, the study's overall methodological approach was essentially one that has not been previously tested. Furthermore, the study was constrained by the inherent limitations associated with undertaking a PhD especially in terms of restrictions on study timeframes and limitations placed on the scale of what could be investigated. Hence, in this PhD, the study consisted of three small pilot-like size projects with each line of inquiry presenting its own set of operational and

methodological limitations. For example, with regard to the implementation of the BOHHC model at Time 1, the case study approach was limited to four home care provider sites involving three different aged care organisations. The steps taken to counteract the risk of bias and maintain data trustworthiness included engaging a range of home care sites representative of metropolitan, regional and country locations in two Australian States: South Australia and New South Wales. Participating older people included non-Indigenous and Indigenous home care clients. There was no significant difference in the mean age and gender ratio of clients who consented and those that did not consent to participate in the study. The older person cohort was representative of a range of clients receiving both low and high home care services through either a home care package or home support. The home care staff profile was consistent across the sites and was compatible with the national data available at the time. From a methodological perspective, the acknowledged limitations of the PARIHS framework, in terms of a lack of practical guidelines and tools, prompted the research process to be an iterative one that involved the testing and refining approaches as they took place throughout the implementation process.

Similarly, the evaluation of the BOHHC learning and teaching package was limited by size and involved one university and one vocational training organisation both situated in South Australia. The student questionnaires were developed for this study and the data relied on student self-reporting rather than direct clinical assessment of oral health competency. The steps taken to counteract the risk of bias and maintain data trustworthiness included gaining the perspectives of three different student groups (Bachelor of Nursing, Diploma of Nursing and Certificate III in Aged Care). This also included nurse educator feedback from each course involved in the study. Student questionnaire data were rigorously analysed using inferential statistics. Methodologically this line of inquiry using the Kirkpatrick model, primarily exposed the rudimentary nature of the model. This finding highlighted the limitations of using a positivist outcome approach to measure learning, thus reinforcing the need to further develop training evaluation models that recognise the complexity of learning and teaching.

Lastly, evaluation of the sustainability of the BOHHC model at Time 2, was limited to a case study of one large South Australian aged care organisation involved at Time 1. The recruitment of participants for the RE component of the thesis was time consuming with a small number of 14 respondents agreeing to participate. The steps taken to counteract the risk of bias and to maintain data trustworthiness included gaining perspectives from two subcases: metropolitan and country sites. This included data from different levels of staffing representative of corporate, managerial, clinical and direct care positions and consumers representative of low and high care recipients. This also involved engaging three independent researchers (one aged care representative and two academic experts in KT and RE) to review the data analysis. An interpretive meeting was also called inviting participating

staff members to validate the data findings. In terms of methodology, the primary limitation of applying NPT with RE to explore sustainability was its novel and untested nature. Subsequently, given the absence of past research and practical guidelines for using this approach, this part of the research process was particularly challenging and involved an intensive iterative process of testing and refining approaches as they took place.

9.5 Self-reflection and learning

Being able to better understand how to navigate the complexity of how to get evidence into practice was a great personal motivation for undertaking this thesis. However, if truth be known, this PhD journey has served to reinforce that the understanding of complexity is indeed messy and still evolving, and while there are some theories and frameworks that attempt to address this, there is a great need for improved alignment in this area of research and for the further refinement of methodologies and tools. What stands out most from this learning, is the challenge involved in reconciling the need for high level thinking demanded by realist thinking with the practicalities of applying it, especially in a public healthcare context where there is constant pressure from short policy cycles and competing political and/or organisational priorities that perpetuate an unquestioned acceptance of narrow solutions and the use of rudimentary methodologies that support quick and simple answers to complex questions.

While there is growing realisation that complexity (commonly referred to by policy makers as wicked problems) cannot be resolved by using traditional problem solving methods, the challenge remains in how do you convince politicians, policy makers, service providers and practitioners to adopt KT processes so they are better equipped to achieve successful implementation outcomes and ongoing sustainability of the healthcare programs they invest in. Likewise, given the need for advanced theoretical and methodological understanding that goes with realist approaches, additional challenges involve encouraging multiple engaged scholarship opportunities to support practitioners and consumers (from a wide range of contexts) to utilise evidenced-based healthcare. This includes the need to better understand how to facilitate the formation of ongoing inter-sectoral collaborations supportive of multilevel sustainable systemic change.

9.6 Implications for future research

Therefore, in terms of reconciling the complexity of improving oral health for older people with realist approaches, further research is need to explore whether the strategies identified in this thesis optimise sustainable change in the home care context. This includes gaining a better understanding of whether the characteristics of a predominantly ageing home care workforce with lower-level qualifications differs from the findings of the literature, which largely reports on maintaining behavioural change in health professionals.

Given the government CDC policy directive underpinning the home care package provision, further realist research focusing on the mechanisms that influence older people's decision-making processes is warranted. This would involve exploring the home care provider's role in supporting older people to achieve genuine CDC and, in doing so, deepen the understanding of how home care providers can create an enabling healthcare context that genuinely promotes and sustains person-centred care. From an oral health self-care perspective, further research is needed to investigate whether dental sector-led interventions, such as social mass media 'self-care' campaigns, have an impact on changing the general public's perceptions on what constitutes acceptable standards of oral healthcare, and how this, in turn, could shape CDC outcomes.

Similarly, there is opportunity to advance the research on 'healthy ageing' by comparing interventions to improve people's oral healthcare self-care literacy with improvements in oral health outcomes, general health and wellbeing. With regard to research on the fundamentals of care, this thesis calls for oral healthcare to be considered separate from personal cleansing and dressing activities. It is recommended that a stronger focus be placed on oral healthcare to highlight its significance as an important infection control intervention essential for good health and healthy ageing.

Furthermore, the introduction of New Aged Care Standards offers the opportunity to study how accreditation criteria influence oral healthcare practice, including how oral healthcare is prioritised, and how this, in turn, influences the reflexive monitoring of oral health outcomes. Points of interest would be to identify what oral healthcare evidence is used in the accreditation of safe personal care and effective service provision. This includes understanding how the standards are used to evaluate whether the workforce is sufficiently skilled or not, as well as understanding how the standards assess whether the consumer is being supported to make informed oral healthcare choices. This research could be used to capture how effectively the National Aged Care Assessment is being used to identify oral health problems, and how this information, in turn, is utilised by home care providers to inform care planning.

Lastly, the positive and negative mechanisms identified in this thesis strongly support the supposition that improving oral health for older people has macro-level policy implications that require ongoing inter-sectorial facilitation involving the aged care, vocational healthcare education and dental sectors, and consumer advocacy. Further research using the emerging KT complexity network model is proposed to explore the how the five sectors – research, education, health, government, community (including industry) – can be incentivised to create oral health collaborations such as a national oral health network. The application of RE to this research would deepen understandings of how contextual factors mediate inter-sectorial collaborative processes. In doing so, this research would contribute to advancing implementation science, and to the evolving literature on collaboration.

9.7 Conclusion

This thesis uniquely captures the journey from implementation to evaluation of sustainability in a way that has not been demonstrated before in oral healthcare research. This study's endeavour to reconcile the complexity of improving oral health for older people with realist approaches marks a significant shift away from the traditional positivist approaches that have dominated previous research on this topic. In doing so, the study has achieved a better appreciation of how home care providers can support older people to age well at home. The use of a range of theoretical frameworks and methodological approaches, such as the PARIHS framework, NPT, RE and the Kirkpatrick model, created a uniquely blended approach to the three interrelated elements of inquiry investigated by this study. Moreover, the novel approach of using NPT with RE has provided a theory-led approach with which to gain a deeper understanding of how contextual factors influence home care staff's ability to implement and sustain oral healthcare at macro, meso and micro levels of practice. Furthermore, the study results concur with the findings of the i-PARIHS framework in highlighting the importance of multi-level facilitation as a key active ingredient in the processes of implementation. Similarly, the study proposes that continued multi-level facilitation is needed to actively link the NPT core constructs of coherence, cognitive participation, collective action and reflexive monitoring so that changes in staff behaviours are maintained and remain conducive to embedding sustainable practice. Lastly, the study's findings contribute to contemporary research on the fundamentals of care, giving prominence to the significance of oral healthcare as an important infection control intervention that is essential for healthy ageing. Practical strategies and recommendations for future research have been put forward, advocating for the need for greater inter-sectorial collaboration to incentivise efforts conducive to sustainable evidence-based oral healthcare for older people.

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