Implementation of Oral Health Recommendations into Two Residential Aged Care Facilities in a Regional Australian City

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Abstract

Background Residents of aged care facilities usually have a large number of oral health problems. Residents who suffer from dementia are at particular risk. A systematic review of the best available evidence with regard to maintaining the oral health of older people with dementia in residential aged care facilities provided a number of recommendations.

Objectives The aim of the implementation project was to introduce evidence-based oral hygiene practices for patients with dementia in two publicly funded residential aged care facilities and monitor for changes in nursing awareness, knowledge, documentation and practice to improve patient outcomes and ensure appropriate accreditation standards were met. An additional aim was to identify barriers and strategies to overcome barriers to implementation of evidence-based recommendations.

Methods Two facilities, a 40-bed facility and a 71-bed facility in the health service district of the regional Australian city of Toowoomba, provided the setting. A quality improvement approach was taken, using a number of strategies from the National Health and Medical Research Council guidelines for implementation studies. The implementation involved a number of stages, including project development, interactive oral health education, oral audits of residents, changes to oral hygiene practice via care plans and critical reflection.

Results The multidisciplinary approach to improving oral healthcare appeared to improve knowledge and awareness and move oral health practices in facilities closer to best practice. Specialised training in oral health was provided to a Clinical Nurse Consult-ant. Regular oral audits were introduced and facility staff were trained in the use of the oral audit tool. Care plans at one facility were of better quality and more comprehensive than before the intervention. Comments made during critical reflection suggested improvements in the oral health of residents, increased use of oral swabs and saliva substitutes, improved care of dentures and mention of the use of mouth props in resident care plans. There was also some evidence that changes brought

about by the implementation are sustainable.

Conclusion The majority of recommendations provided in the systematic review of oral healthcare for dementia patients were applicable to the applied context. The importance of day-to-day leaders was highlighted by the apparently varied out-comes across target facilities. The quality improvement approach would appear to have considerable advantages when applied to improving practice in residential aged care.

Keywords: aged care; evidence-based practice; implementation; multidisciplinary.

Background

In the most recent National Oral Health Survey conducted in Australia, more than 90% of people aged 60 and over suffered periodontal diseases.[1] Oral health problems, in particular dental pain, in older people can contribute to a variety of health conditions and management issues. Poor oral health can impair nutritional status, leading to weight loss.[2] Accumulation of dental plaque is associated with the development of aspiration pneumonia.[3] Additionally, decreases in salivary flow and quality associated with ageing can increase the risk of dental caries and cause problems in relation to eating, speaking and wearing of dentures.[4,5]

A large number of oral health problems are also witnessed in aged care residential facilities.[6,7] The impact of periodontal disease is exacerbated in aged care settings because of a trend towards fewer natural tooth losses and a decreasing trend in the number of false teeth. These trends are expected to lead to increased chronic degenerative problems (such as tooth wear, tooth fracture, root caries and pulpal necrosis) in aged care settings.[8]

Residents of aged care facilities who suffer from dementia are at particular risk of developing oral health problems. Poor maintenance of oral hygiene before being admitted to residential care results in high levels of decay and periodontal disease, which quickly deteriorate upon admittance to residential care.[6,7] Additionally, oral healthcare issues are exacerbated by reduced physical dexterity, impaired sensory functioning and communication and behaviour problems associated with cognitive decline.[9–12]

It is important that there be capacity to meet the oral health needs of older dementia patients in residential care facilities. To demonstrate that an aged care facility is providing appropriate quality care, services must undergo assessment by the Aged Care Standards and Accreditation Agency. Facilities without accreditation are generally ineligible to receive Australian Government funding. Accreditation standard 2.15 relates to oral and dental care. The expectation is that residents' oral and dental health is maintained.[13] Chalmers recommends a multidisciplinary team approach to oral care for older persons, with both oral health practitioners and other primary healthcare providers being involved.[14]

A recent systematic review conducted by Pearson and Chalmers presented the best available evidence with regard to maintaining the oral health of older people with dementia in residential aged care facilities.[15] They provided a number of recommendations that, along with the Grades of Recommendation based upon the Joanna Briggs Institute (JBI)-developed Grades of Effectiveness,[16] are presented in Table 1.

The difficulties associated with translation of best evidence into practice are well documented, with time lags of between 8 and 15 years observed between publication of best practice information and adoption into clinical practice.[17,18] Efforts to promote best practice have received increasingly greater attention in the literature and a range of strategies used to implement best practice have been evaluated, including educational materials, use of local opinion leaders, audit and feedback, reminders and decision support systems.[19] While many of these strategies are modestly successful, interventions involving a combination of strategies are generally more effective in changing practice than single-strategy interventions.[20–24]

In early 2005, an audit of oral care practices in two publicly funded residential aged care facilities on the Darling Downs identified shortcomings in oral hygiene of patients with dementia in these facilities. The Australian Centre for Rural and Remote Evidence-Based Practice (ACRREBP) is an inter-national collaborating centre of the JBI situated at the Toowoomba Health Service in the regional centre of Toowoomba, Queensland, Australia. The Advisory Board for the ACRREBP, which consists of representatives from the Toowoomba Health Service District (THSD) and the Centre for Rural and Remote Area Health at the University of Southern Queensland, identified the Oral Health Systematic Review as a priority implementation project for Toowoomba Health Service District Aged Care Services. The oral health implementation

project used best practice, as outlined in the Pearson and Chalmers systematic review,[15] other recently published evidence-based guidelines[25,26] and the Maintaining Mature Mouths (MMM) education program,[27] to improve nurses' awareness, knowledge, documentation and practice of oral care for patients with dementia in these settings.

Table 1 Recommendations from the Pearson and Chalmers systematic review[15]

Regular toothbrushing with fluoride toothpaste (Grade A)
Drinking and use of fluoridated water in cooking, etc. (Grade A)
Application of therapeutic fluoride as an extra-strength 5000 p.p.m. toothpaste, a mouth rinse (in spray bottle) or application of gel (Grade B) Reducing intake and frequency of sugar consumption (Grade A)
Regular intake and frequency of sugar consumption (Grade A)
Regular dental check-up and professional cleaning (Grade A)
Provisional hands-on oral health training programs for nursing and care staff to improve oral hygiene care provision to residents of residential aged care facilities (Grade B)
Use of antimicrobial chlorhexidine gluconate gel or mouth rinse/spray (Grade B)
Use of saliva substitutes or regular chewing of sugarless gum where appropriate to reduce xerostomia (Grade B)
Regular physical cleaning of dentures, naming of dentures and removal of dentures at night (Grade B)
Use of mouth props and modified dental equipment to help with stabilising the jaw, break chewing or biting reflexes, improving mouth access (Grade C)
Staff to conduct a dental screening assessment and/or completion of a dental examination by a dentist upon residents' admission to facility and regularly thereafter (Grade B)
Improved relationships between dental professionals and residential care facility staff to ensure the dental team becomes a part of the residential care team (Grade C)
Development of specially trained individuals in residential care who are responsible for dental issues such as residents' oral assessments, monitoring the provision of regular oral hygiene care, staff training in oral health issues and organising dental appointments (Grade C)

Aims

The aim of this pilot implementation project was to introduce published evidence-based oral hygiene practices for patients with dementia in two publicly funded residential aged care facilities and monitor for changes in nursing awareness, knowledge, documentation and practice to improve patient outcomes and ensure appropriate accreditation standards were met. An additional aim was to identify barriers to implementation of evidence-based recommendations and strategies to overcome these barriers.

Method

The research approach used was based on quality improvement principles.[28] Specifically, although a single cycle was conducted in this pilot, a Plan-Do-Check-Act (PDCA) approach, adapted from the National Health and Medical Research Council (NHMRC) guidelines for implementation studies[29] and the Queensland Health Quality Improvement and Enhancement Program,[30] was used. Using quality processes already familiar to facility staff to embed best evidence recommendations into facility practice was intended to make the implementation more meaningful to staff.

In the PDCA quality cycle, the *planning* stage involves development of implementation objectives and a plan to implement and test changes brought about by implementation. The *doing* stage involves carrying out the implementation and documenting problems and unexpected observations. The *checking* stage involves analysing data, comparing data with initial implementation objectives and summarising and reflecting on what was learnt. In the *acting* stage, the implementation is refined on the basis of what is learnt and a plan prepared for the next implementation cycle. As this paper reports the first cycle in a set of continuous improvement cycles, it provides information on the planning, doing and checking stages of the first quality cycle.

Research setting

The Toowoomba Health Service is a publicly funded health service located in the regional city of

Toowoomba, about 100 km west of the state capital of Brisbane. The service district encompasses Toowoomba and surrounding districts, providing services to an estimated resident population of 142 000 people, of which 11.8% are aged 65 years or more.[31] Additionally, public patients from many rural and remote areas of Southern Queensland make use of the Toowoomba Health Service for specialised services not available in their communities. As well as public hospital and mental health services, this health service provides community health, oral health and aged care services.

Two publicly funded residential aged care facilities provided the setting in which the implementation took place. Facility A is a 40-bed facility and Facility B a 71-bed facility, both located within the THSD. Both facilities have secure environments for residents with cognitive impairment, enjoy full accreditation with the Aged Care Standards and Accreditation Agency and have a robust quality process. Toowoomba Oral Health Services provides dental services throughout the THSD including emergency treatment, general dental treatment and prosthetic treatment. The staff consist of dentists, oral health therapists, dental assistants and dental technicians.

Implementation stages

Simple dissemination of guidelines has little effect upon changing practice.[20,32] A multifaceted approach to implementation, one that draws on a range of different sources of knowledge and implementation strategies to bring about change, is more effective than a single-intervention approach.[23,33–35] A number of different approaches were taken during this implementation.

The implementation involved a number of stages:

- Project development;
- Interactive oral health education sessions;
- Oral audits of patients with dementia;
- Changes to oral hygiene practice via care plans; and
- Critical reflection.

Project development

Development of a project team with the right elements is a very important aspect of effective implementation.[29] Before the implementation, a project team was established to drive the implementation process. Consistent with the quality cycle approach,[28] a team from participating organisations was formed and included:

- People with technical expertise on the topic such as the Senior Dental Therapist from the THSD Oral Health Unit, the nurse educator from the Toowoomba Health Service, and experts in continuous quality improvement, research methods and data analysis from the ACRREBP.

- Day-to-day project leaders including a Clinical Nurse Consultant from Facility A and registered nurses and personal carers from both facilities.

A number of project team meetings were held before the implementation to develop the implementation objectives, discuss implementation strategies, adapt best practice recommendations to the local context, and discuss data collection and analysis issues and governance issues. Additionally, an implementation protocol was developed and sent to the JBI for approval. The protocol was ratified by JBI before beginning the implementation.

Interactive oral health education sessions

Simple passive dissemination of materials in the form of didactic lectures or printed materials is rarely shown to influence behaviour. Rather, research has shown that education delivered in an interactive format is more likely to produce behaviour changes.[24,36,37] In 2002, the Queensland Health Oral Health Promotions Unit released the MMM education program.[27] The MMM program was first developed by two oral health therapists in Cairns and Innisfail. It was designed as a learning package for staff providing oral healthcare for older persons in residential and community settings in Queensland. The program was piloted in two health service districts in Queensland and is now available on a state-wide basis and was adopted as the interactive

educational component of this implementation.

A series of three instructional sessions each lasting 1 h were provided at both facilities between March and May 2005. Of the 30 eligible staff at Facility A, 28 (93.3%) participated in education sessions. Of the 60 eligible staff, including casual staff at Facility B, 36 (60.0%) participated. Additionally, staff unable to attend sessions were provided a copy of the MMM participant sheets that contained all information presented in in-service sessions.

The MMM program provided a facilitator's guide, Powerpoint presentations and a participant learning journal. In-service sessions were presented in each facility by the Senior Oral Therapist from the THSD Oral Health Unit. Content covered the holistic significance of oral health status and the relationship between nutrition, dental disease and prevention. Education was provided to staff about oral assessment, individual planning and dental techniques. These techniques related to interdental cleaning, brushing, denture maintenance and behavioural interventions. Staff were also introduced to the concepts of 'task breakdown', rescuing, distraction, bridging, hand-over-hand and chaining as outlined in the oral hygiene systematic review.[15] They were also introduced to dental props to assist in oral care provision in older persons with dementia. Included in session content was the importance of appropriate communication for these residents. Additionally, supplemental instruction from the oral hygiene systematic review[15] was provided. The best practice information sheet *Oral Hygiene Care for Adults with Dementia in Residential Aged Care Facilities* was included as an appendix to the participant journal.

Evaluation questionnaires. Included in the MMM program were pre- and post-intervention questionnaires to assess improvements in knowledge about oral health in older people. Before and subsequent to the educational intervention, these questionnaires were completed by staff. The 16-item pre-intervention questionnaire contained a mixture of Likerttype and yes/no items (e.g. 'People with false teeth do not require regular cleaning of their mouth', 'I should stop brushing if the gums start bleeding'). The post-intervention questionnaire included these same 16 items, but also included items ascertaining the utility of the materials provided, the quality of delivery and an open-ended question asking for suggestions and feedback about the program. Only staff given the pre-education questionnaire were provided with the post-education questionnaire. Response rates were 85.7% for pre-education questionnaires and 50.1% for post-education questionnaires at Facility A, while rates at Facility B were 72.2% for pre-education questionnaires and 42.4% for post-education questionnaires.

Oral audits of patients with dementia

Upon reviewing the literature and recommendations from the Pearson and Chalmers systematic review,[15] the decision was made by the research team to develop an audit tool appropriate to the purposes of the audit and the settings in which the audit was to take place. These provided a bench-mark for the oral status of persons with dementia in each facility. This measurement also allowed the investigators to determine whether differences in baseline levels of oral health existed between facilities as this may have potentially impacted upon the utility of implementation strategies.

Audit tool. The developed audit tool was adapted from the Kayser-Jones Brief Oral Health Status Assessment[38] and the Oral Exam Guide developed by Beck.[39] The THSD Oral Health Service contextualised both tools to suit the aged care environment and staff skill mix. The tool contained six categories upon which ratings were made (lips, gingiva and oral mucosa, tongue, full dentures, teeth and/or partial dentures, and saliva). For each category, the rater provided a score between 1 and 4, with higher ratings indicating greater levels of oral dysfunction. A summative oral dysfunction score was obtained, with a score of 5 or less indicating no oral dysfunction, between 6 and 10 indicating mild oral dysfunction, between 11 and 15 indicating moderate oral dysfunction and 16 or greater indicating severe oral dysfunction. A copy of the tool is provided in Table 2.

Procedure. During the period the education sessions were being conducted, a designated Clinical Nurse Consultant from Facility A was trained by the THSD Senior Dental Therapist to conduct oral audits at both facilities. In turn, the Clinical Nurse Consultant instructed Registered Nursing Staff from each facility on the application of the tool. The Senior Dental Therapist accompanied the Clinical Nurse Consultant to the first audit to ensure that the audit was conducted appropriately and that the audit tool was correctly completed and scored. Oral audits were

conducted on all persons diagnosed with dementia at each of the facilities at the time that the audits were conducted. In all, audits were conducted on 17 patients from Facility B and 19 patients from Facility A.

Changes to oral care plans

System supports or reminders are regarded as an effective strategy for producing behaviour change in multifaceted implementations.[22,34] Fortunately, a vehicle for this strategy existed in the facilities in the form of care plans. A care plan is documented information that guides the delivery of resident care. It identifies patient needs and sets out the base-line level of services and care provided to meet those needs, including communication, nutrition, hygiene (including oral hygiene), mobility and social interaction. It generally consists of three sections:

(1) a statement of problems/issues identified during assessment;
(2) resident-centred goals relating to identified problems and issues, in the form of appropriate and achievable outcome statements; and
(3) strategies, interventions or actions to assist residents achieve or maintain goals.[13]

When care plans are accurate, up-to-date accurate and relevant, effectiveness and consistency of communication between registered nurses and other care providers in the facility is enhanced.[40–42] In the targeted facilities, care plans are written by the registered nurse and care staff are expected to follow the plan in a prescriptive manner. Care plans are reviewed regularly. However, a review conducted at the target facilities before implementation showed that registered nurses were not documenting specific interventions in oral care. Because of this, other workers involved in providing oral care may have been self-determining interventions.

Sections of resident care plans relating to oral care were considered by the project team to be an important component in evaluating the implementation success. Evidence for this would be present, for example, if sections related to oral care in care plans reflected practices closer to evidence-based recommendations and guidelines post-implementation compared with pre-intervention.

Table 2. The oral audit tool

Category	Rating				1	2	3	4
Lips	1	2	3	4	Smooth, pink, moist, intact	Slightly wrinkled and dry; one or more isolated reddened areas	Dry and somewhat swollen; may have one or two isolated blisters; inflammatory line of demarcation	Extremely dry and oedematous; entire lip inflamed; generalised blisters or ulceration
Gingiva and oral mucosa	1	2	3	4	Smooth, pink, moist, intact	Pale and slightly dry; one or two isolated lesions, blisters or reddened areas	Dry and somewhat swollen; generalised redness; more than two isolated lesions; blisters or reddened areas	Extremely dry and oedematous; entire mucosa quite red and inflamed; multiple confluent ulcers
Tongue	1	2	3	4	Smooth, pink, moist, intact	Slightly dry; one or two isolated reddened areas; papillae prominent, particularly at base	Dry and somewhat swollen; generalised redness but tip and papillae are redder; one or two isolated lesions or blisters	Extremely dry and oedematous; thick and engorged; entire tongue quite inflamed; tip very red and demarcated with coating; multiple blisters or ulcers
Full dentures	1	2	3	4	Clean, unbroken teeth, worn most of the time	One broken/missing tooth	Worn for eating or cosmetic purposes only	Dentures not worn or no dentures
Teeth and/ or partial dentures	1	2	3	4	Clean; no debris	Minimal debris, mostly between teeth	Moderate debris clinging to half of visible enamel	Covered with debris
Saliva	1	2	3	4	Thin, watery, plentiful	Increased	Scanty, may be thicker than normal	Thick, ropy, viscid or mucoid
Oral dysfunction score					None	Mild	Moderate	Severe
Total					5	6–10	11–15	16–20

The four levels correspond to the level of oral dysfunction. To rate the patient, circle the appropriate number in the second column. Once scored, check the score against the recommended interventions for care planning.

Care plan rating tool. To determine the quality and comprehensiveness of oral hygiene instruction in care plans, a Care Plan Rating Tool was developed. This tool is presented in Table 3. Five areas targeted in care plan development during the implementation (cleaning, dental checks, mouth moisture, mouth props and regularity of staff assessment) were rated for their presence or absence within the care plan. A tick was given for each item present in the care plan. A cumulative maximum score of 14 was possible, with higher total scores indicating the presence of more appropriate instructions for a particular resident.

Procedure. The Clinical Nurse Consultant on the project team provided de-identified copies of care plans to the project team. Sections of care plans related to oral health before the beginning of the implementation for residents from each facility were analysed. Fifteen pre-intervention care plans were collected from Facility B and 19 from Facility A. Post-implementation care plans to be compared with pre-intervention care plans were collected in September 2005, 6 months after the implementation began. Seventeen post-implementation plans were collected from Facility A as two patients from the original sample died during the implementation period. It became evident that care plans at Facility B had not changed during the implementation period. This was primarily because the facility sponsor and project champion from Facility B took significant periods of leave during the implementation. Because of this, no post-intervention care plans were collected from Facility B. Two registered nurses, experienced in aged care and independent of the project team, rated the quality and comprehensiveness of care plans using the Care Plan Rating Tool. For the purposes of this exercise, all oral health sections of care plans from both facilities were presented to the raters in random order to ensure that the rating process was not biased by knowledge of:

(1) whether care plans were pre-intervention or post-intervention; or
(2) the facility from which the care plan was collected.

Table 3. The care plan rating tool: criteria for rating oral healthcare plans

Please tick if the care plan has indicated/approximated the criteria	
1. Cleaning	Own teeth or dentures
	Frequency
	Cleaning devices
	Stepped instructions
2. Checks (dental)	Frequency
	Rationale
3. Mouth moisture	Creams
	Gels
	Spray
	Frequency
4. Mouth props	
5. Regularity of staff assessments	Frequency
	Rationale
	How to assess (tool)
Total score	
Rating scale – please circle the rating according to the total score above. For example, if the total score above was 3, you would circle 'Poor'	
0-3	Poor
4-6	Average
7-10	Above average
11-14	Excellent

Critical reflection

As explained earlier, PDCA requires a process of critical reflection during the checking stage. This was achieved during the implementation through the use of a post-implementation feedback session conducted in early November 2005, with all project team members attending. Consistent with the approach recommended in models of continuous quality improvement,[28] this session was conducted in the form of a semi-structured focus group. This methodology was chosen so that

relevant issues could be explored in depth.[43] Focus groups use the interaction between participants to gain information about the knowledge and experience of a particular topic and often provide insight into the cultural context of attitudes and ideas surrounding the topic.[44] The aim is to provide an opportunity for participants to express their own ideas, opinions and attitudes, and give a broad and rich response to the topic under investigation.[45] A series of open-ended prompts were used to gather information on the implementation while still allowing flexibility to explore issues more deeply if appropriate.[46] The prompts are provided in Table 4 and gathered information on project achievements, barriers to successful implementation and ways to overcome those barriers, the relevance of recommendations to clinical practice and the future of the project. Follow-up interviews and emails with facility staff and managers provided clarification of issues.

Table 4. Prompts used for the post-implementation feedback session

- Can you tell me a bit about the goals of the implementation and the processes used during the implementation?
- What, in your minds, did the implementation project achieve in your facility?
- What difficulties did you encounter during the implementation? How were these difficulties overcome and if they were not overcome, how could they be overcome in the future?
- In what ways do you think that clinical practice at the sites has moved towards best practice?
- Have a look at the recommendations from the Joanna Briggs Institute systematic review. What do you think about the applicability of these recommendations to the clinical context at your facility?
- Do you think that the changes brought about by the implementation project have or will improve oral health for people with dementia at these sites? In what way?
- Would there be anything that you would do differently if you were doing this process again?
- Where to from here?

Data analysis

Data collected during the implementation process included:

- quantitative data from the pre- and post-education questionnaires, the pre-intervention oral audits and the care plan ratings; and
- qualitative data derived from the post-implementation feedback session and follow-up.

Education questionnaires

Raw data from these questionnaires were summarised using percentages for categorical variables. Items scored on Likerttype scales were treated as continuous variables and described in terms of means and 95% confidence intervals. The identity of the person filling out the pre- and post-education questionnaires was not retained because of the anonymous nature of data collection. Comparisons across facilities on the pre-education questionnaire and across pre-and post-education questionnaires therefore were made when appropriate using cross-tabulations with $\chi2$ tests of significance for categorical variables and independent-groups t-tests for Likert-type items. For these and all subsequent analyses, α level was set at $P = 0.05$.

Oral audits

Total scores for each resident from the oral audit tool were categorised into mild, moderate or severe oral dysfunction. Overall percentages and percentages across facilities of level of oral dysfunction were calculated. Differences across facilities in total audit scores and within particular categories of oral dysfunction (i.e. lips, gingiva and oral mucosa, tongue, full dentures, teeth, saliva) were tested using independent-groups t-tests.

Care plan ratings

Inter-rater reliability of the Care Plan Rating Tool total scores was ascertained using a Pearson correlation coefficient. The average of the total across raters on the tool was used as the raw score

for subsequent analyses. Raw scores for pre-implementation at Facility B and pre- and post-implementation at Facility A were summarised using means and 95% confidence intervals. To determine whether differences existed in the quality of pre-intervention care plans across facilities, an independent-groups *t*-test was conducted. A paired-samples t-test was used to compare care plan ratings at Facility A before and after implementation.

Data from the post-implementation feedback sessions

The transcript from the post-implementation feedback session was transcribed verbatim. Data were then analysed by coding it and grouping it into categories and themes.

Results

Education questionnaires

The summarised raw data from the pre- and post-education questionnaires is presented in Table 5. Pre-course knowledge of respondents was quite good. Across the facilities, however, 32.7% of respondents agreed that tooth loss was inevitable with old age, 34.0% felt they should stop brushing if the gums start to bleed and 36.0% said that they did not regularly take the opportunity to encourage relatives of residents to bring healthy nutritious foods. There were no significant differences across facilities on any of the items on the pre-education questionnaire.

Two differences were observed between responses to items across the pre- and post-education questionnaires. On the pre-evaluation questionnaire, 56.0% of respondents did not think they should stop brushing if the gums start bleeding compared with 85.7% responding false on the post-evaluation questionnaire, χ^2 (1) = 5.72, *P* = 0.02, Cramer's *V* = 0.28. Additionally, 57.1% of the respondents on the pre-evaluation questionnaire stated they removed their residents' dentures from the mouth and soaked them in water overnight, compared with 84.0% of respondents on the post-evaluation questionnaire, χ^2 (1) = 5.86, *P* = 0.02, Cramer's *V* = 0.29. There were no other significant differences.

All respondents in the post-education evaluation felt that information provided was useful to their work. Nearly 90% felt that the materials assisted them in their learning. Over 90% rated course delivery as being excel-lent or good. All participants reported that course providers were helpful, friendly and supportive throughout the course.

Oral audits

Of the 36 audits conducted, 22 (61.6%) patients had moderate oral dysfunction, 13 (36.1%) had severe oral dysfunction and 1 (2.8%) had mild oral dysfunction. There were no differences in overall audit scores across the facilities (Facility A, mean = 14.1; Facility B, mean = 15.0), *t*(34) = 1.19, not significant. However, the overall condition of residents' tongues was worse at Facility B (mean = 2.4) than Facility A (mean = 1.8), *t*(32) = 2.41, *P* = 0.02. Conversely, the overall condition of residents' teeth was worse at Facility A (mean = 3.9) than Facility B (mean = 3.4), *t*(15) = 2.44, *P* = 0.03. There were no other differences.

Ratings of care plans

Inter-rater reliability on ratings of care plans was accept-able, *r* = 0.84, *P* < 0.001. Differences in mean ratings across facilities before implementation did not reach significance (Facility A, mean = 2.4; Facility B, mean = 1.4), *t*(21) = 1.70, *P* = 0.10. The mean rating of post-implementation care plans at Facility A was 5.2 compared with 2.4 for ratings on pre-implementation care plans, *t*(16) = 5.46, *P* < 0.001.

Post-implementation feedback session

Participants in the feedback session and follow-up inter-views commented about various aspects of the project including the project achievements, barriers, best practice, applicability of recommendations, new recommendations, health outcomes and sustainability of oral health practices.

Table 5. Summary of the raw data from the education questionnaires

Questionnaire item	Facility A		Facility B	
	Pre-education (*n* = 24)	Post-education (*n* = 12)	Pre-education (*n* = 26)	Post-education (*n* = 11)
Tooth loss is inevitable with old age				
Strongly disagree/disagree	58.3	83.3	60.0	70.0
Neutral	8.3	0.0	8.0	0.0
Strongly agree/agree	33.3	16.7	32.0	30.0
Oral health influences our general health				
Strongly disagree/disagree	0.0	16.7	0.0	9.1
Neutral	4.2	0.0	0.0	0.0
Strongly agree/agree	95.8	83.3	100.0	90.9
Regular dental examinations are important in old age				
Strongly disagree/disagree	0.0	0.0	3.8	0.0
Neutral	0.0	0.0	0.0	0.0
Strongly agree/agree	100.0	100.0	96.2	100.0
People with false teeth do not require regular cleaning of their mouth				
Strongly disagree/disagree	100.0	100.0	100.0	100.0
Neutral	0.0	0.0	0.0	0.0
Strongly agree/agree	0.0	0.0	0.0	0.0
It is important to include the aged person in the development of their care plan				
Strongly disagree/disagree	4.2	0.0	0.0	0.0
Neutral	0.0	0.0	0.0	11.1
Strongly agree/agree	95.8	100.0	100.0	88.9
Medications can affect our oral health				
True	100.0	90.9	100.0	100.0
False	0.0	9.1	0.0	0.0
Not sure	0.0	0.0	0.0	0.0
Age, rather than poor oral hygiene, is the main cause of gum disease				
True	4.2	9.1	12.0	20.0
False	91.7	90.9	88.0	80.0
Not sure	4.2	0.0	0.0	0.0
Saliva pays an important role in the maintenance of oral health				
True	100.0	100.0	88.5	90.0
False	0.0	0.0	7.7	10.0
Not sure	0.0	0.0	3.8	0.0
Fluoride is only effective during the development of teeth				
True	0.0	0.0	0.0	33.3
False	91.7	90.9	72.0	44.4
Not sure	8.3	9.1	28.0	22.2
I should stop brushing if the gums start bleeding*				
True	29.2	9.1	38.5	10.0
False	62.5	90.9	50.0	80.0
Not sure	8.3	0.0	11.5	10.0
I clean dentures with a toothbrush and toothpaste				
Yes	79.2	36.4	88.5	80.0
No	16.7	27.3	3.8	10.0
Sometimes	4.2	36.4	7.7	10.0
I remove my patient's dentures from the mouth and soak them in water overnight*				

Questionnaire item	Facility A		Facility B	
	Pre-education (*n* = 24)	Post-education (*n* = 12)	Pre-education (*n* = 26)	Post-education (*n* = 11)
Yes	78.3	72.7	60.0	90.0
No	17.4	0.0	8.0	0.0
Sometimes	4.3	27.3	32.0	10.0
I refer and/or document any anomaly (deviation from what is normal) in the mouth as soon as possible				
Yes	100.0	100.0	88.5	100.0
No	0.0	0.0	3.8	0.0
Sometimes	0.0	0.0	7.7	0.0
I regularly take the opportunity to encourage relatives of residents to bring healthy, nutritious foods				
Yes	25.0	45.5	46.2	40.0
No	50.0	45.5	23.1	20.0
Sometimes	25.0	9.9	30.8	40.0
My workplace provides a balanced selection of foods for residents				
Yes	78.3	63.6	80.0	100.0
No	4.3	0.0	8.0	0.0
Sometimes	17.4	36.4	12.0	0.0
Since completing the coursework, do you feel the information provided has assisted you in your work?				
Very useful/useful	–	100.0	–	100.0
Neutral	–	0.0	–	0.0
Of little use/not useful at all	–	0.0	–	0.0
Did the materials provided assist you in your learning?				
Yes	–	90.9	–	100.0
No	–	9.1	–	0.0
Not sure	–	0.0	–	0.0
How would you rate the delivery of the course?				
Excellent/good	–	91.7	–	90.9
Satisfactory	–	8.3	–	9.1
Poor/very poor	–	0.0	–	0.0
Were the course providers helpful, friendly and supportive throughout the course?				
Yes	–	100.0	–	100.0
No	–	0.0	–	0.0
Not sure	–	0.0	–	0.0

*$P <$ 0.05. Reported figures represent the percentage of the sample in each column who provided an answer to a particular item.

Project achievements

Participants identified that the first phase in the project was to audit the care plans in both facilities. They commented on the limited information contained within them:

> I mean your care plans actually stated the same as ours very, very basic, there wasn't really much in them at all.

> People weren't very well educated in oral health and . . . there [were no] strategies in place for behaviour with dental health . . . And we certainly did have dental problems, heaps . . .

Feedback gained suggested differential gains at each facility. At Facility A, clinical staff commented that care plans had improved, there was an increased knowledge and awareness of

oral health issues, there were improved relationships with oral health professionals, and oral health practices had improved, including the increased use of oral health pro-ducts. The following comments reflect the changes:

> I think there is better outcomes for the residents, there is better care planning of oral health needs, the staff are actually quite knowledgeable now in regards to dental health.

> They actually understand why people need good oral health.

> It is not just a matter of cleaning their teeth, we now know if we don't there is a chain reaction to all sorts of health problems if we don't maintain oral care.

> We have got better relationships between this facility and our facility. I certainly communicate with [oral health therapist] a lot more about oral health issues.

> And there is a lot more use here of . . . the big sponges, the oral blocks are out in the wards, they are probably the two main things. The swabs, I know they are going through a huge amount of so I know they are using them for those people that have been identified as needing them and they will actually write it into their care plans now.

> We had an admission the other day and one of the RNs come and asked for the

paperwork, the authority paperwork for the dentist, without even anybody saying anything and whereas . . . they would never have done that and that guy has been over and he has been followed up on and he actually had a fair bit of treatment to attend to, so he has gone back twice now, whereas that wouldn't have happened before.

The nurses actually love . . . the sponges – they really like them.

The team at Facility B could not identify any substantial changes to their processes. One participant commented:

I think we were already being pretty involved with oral health services actually, we have always had good communication with them and yeah they are very good. We have never had a problem with them. Part of the assessment is oral health on admission.

Other achievements included the addition of oral health education (MMM booklet) to the orientation program. One additional and perhaps unforeseen achievement was the positive change in attitudes towards personal oral health practices. The following comments capture these issues:

Anyone that's new that's come in, I give a copy the Maintaining Mature Mouths booklet, so it has been introduced into the orientation program.

Actually the book Maintaining Mature Mouths, people … have actually changed their own habits as well as what they are doing with the residents so that was a really good education program to do.

Barriers encountered and suggestions to overcome barriers

There were a number of barriers encountered during implementation. These related to the education component of the implementation, conducting oral audits and performing oral care on non-compliant patients, difficulties in changing diet and sugar intake, staffing issues and implementation support at Facility B and continued organisational support for the initiative.

Education component. A number of barriers related to the education aspect of the implementation. There was some difficulty in bringing staff together for training. It was also identified that the oral health therapist conducting the training was also limited in the time she was available for training, making it problematic to provide training sessions to all staff. Workload in any work environment can make it difficult for staff to attend training. Indeed, there was some reluctance to attend because of time constraints. There was also evidence provided that staff providing care did not understand the importance of completing post-education questionnaires. This may have contributed to lower post-education response rates. These issues are exemplified by the following comments:

With the training I have found actually trying to get all the staff there . . . the hardest thing I think was Maintaining Mature Mouths was broken up into three sections and . . . some weren't at the first one and a different lot were at the second lot and then another lot. So it was really difficult to continue through and get it all through.

When you have got three shifts of staff and there is a large proportion of casual staff that come through and part-time staff so it is something that needs to be done, and it is [oral health therapist's] . . . she has got a job to do too.

They are all reluctant to attend education purely because nobody has ever got any time.

I couldn't be bothered returning the book or questionnaire thing. It was all about changing my practice and I knew that I had done that.

Participants made some suggestions as to how staff attendance at education sessions might be overcome. One participant proposed that oral health education sessions be incorporated into a workshop rather than separating con-tent over a number of sessions:

We should maybe incorporate that into an aged care workshop day.

Non-compliant patients. Another barrier was the difficulty in completing oral audits and providing oral care for non-compliant patients. Participants commented on two residents being particularly difficult to assess:

> Actually during the audit . . . there were a couple of episodes where we thought we might get hit here, but we did the whole lot.

> Getting the residents to open their mouths up was a problem – that's a trick in itself.

> A couple of the dementia ones did end up getting a bit tricky.

Dietary issues. Another barrier was an inability to effect recommendations in relation to diet. This was primarily because the dietician had responsibility for dietary and sugar intake of residents and was not a project team member.

> We don't really monitor that . . . it is all done by the dietician.

> I know our dietician here has certainly looked at out diet and there are things that they have changed because it might be too fatty or not appropriate to aged people, but it is not specific to oral health.

To overcome this barrier, the suggestion was made that the dietician be included in the next implementation stage.

> I can bring that up at the next Allied Health meeting.

Implementation support and staffing issues for Facility B. Participants and managers commented that the extended absence of the day-to-day leader at Facility B due to ill health, along with movement of staff to different positions as a result, interrupted successful implementation and caused emotional upset to staff. This meant that time frames for completion of the implementation were considered a lower priority at that facility. Additionally, Facility B received relatively limited day-to-day support for the implementation compared with that received by Facility A.

> The abrupt departure of the manager – due to ill health – resulted in staff having to relieve in higher duties without warning – causing unforeseen short-term staff shortages and a reprioritising of issues at hand.

> The [Clinical Nurse Consultant] who was provided with the specialised training – . . . who drove the cause at [Facility A, produced] greater acceptance and participation rates due to the fact that she was on site every day and hounded the staff . . . to comply. . . . She had very limited time at [Facility B] to provide information and education to staff.

Suggestions to overcome this barrier included identification and development of back-up day-to-day drivers as a contingency to events occurring during the implementation period at Facility B and provision of specialised training to Clinical Nurse Consultants at both facilities.

> Experience gained . . . highlights the importance of having back-up sponsors so the momentum can be maintained .

> In hindsight, [Clinical Nurse Consultants] at both facilities should have received the training.

Organisational support. Some concern was expressed over project sustainability because of impending structural changes to the Oral Health Unit. Because of this, there was a perception that the level of support provided to the implementation by the Oral Health Unit might decrease.

> [Senior Oral Health Therapist] has to reapply for a job . . . if she leaves we are in trouble.

> They have abolished my position and consolidated it into one so three people have now got to become one.

Towards best practice in oral healthcare

When asked whether clinical practice had moved towards best practice, participants commented on the relevance of evidence to practice:

> All that they are doing now is actually evidence based so it has come out of . . . Maintaining Mature Mouths.

Having a specifically trained individual in the facility was seen as a move towards best practice. At

Facility A, practice application was addressed creatively through the 'tooth-fairy' role for a designated enrolled nurse at the facility. The following comments emphasised the value of this:

> And I think too, [oral health therapist] and I had the one-on-one education too so I know where I'm going too so I can help the staff with what they are doing as well.

> Though I must admit having [specifically trained individual] trained, there are people [who] will ask . . . why are we doing this and why would we and if she gives them a good enough answer, its 'OK, well then we will do it'.

> An Enrolled Nurse has the portfolio of oral care and plans to provide information reminders and consumable and equipment review for all staff on an ongoing basis. If this nurse leaves the facility, the portfolio is expected to be reallocated.

Consistency in care plans and standardisation of staff education were also reported as moves towards best practice:

> And as [registered nurse] was saying before it's giving consistency between the care plans, the information in the care plans for the patient care because [registered nurse] has been in contact with so many because the care plans are electronic and so it has provided opportunity for standardisation in staff education.

Applicability of systematic review recommendations to clinical context

Participants believed that recommendations had been adopted and were relevant to the clinical context. The following participant comments:

> I actually think they are relevant, I mean certainly most of it is in place here and it is working.

Table 6 provides a list of the JBI recommendations and relevant comments from participants in the feedback session. Each recommendation was supported, except for those regarding fluoridated water and reduction in sugar consumption. Comments in the left-hand column highlight issues associated with these recommendations.

While staff supported recommendations, they emphasised that recommendations needed to be individualised for each resident and that some decisions about recommendations had to be made by dental professionals and not facility staff (registered nurses) (see comments in relation to Recommendation 7).

> All the care plans . . . it's not just one fits all and so what you have got to do is take into consideration their ability to cope . . . I mean it is ok to say they should all have a professional clean but [for] some of them . . . it is a holistic approach that is taken.

Impact of project on health outcomes for people with dementia

There was an expectation that changes to residents' teeth and gums would not be apparent for at least 12 months. The following participant makes this comment:

> We had talked about, and when we spoke to [oral health therapist] and I thought that it would probably be 12 months before you would see a change.

However, the participants had noticed some change in residents' gums.

> Q. Has the oral health of the people improved; are their gums looking a lot better?
> A. Yeah we have been using the swabs and things.
> A. I think they look better. They were accumulating a bit of scale, and I think having the nurses more aware, they are more diligent whereas before it was 'oh well we will just do this it doesn't matter if there is a bit of food left here or there'.

Table 6. Feedback on the Joanna Briggs Institute systematic review recommendations

Recommendations from the Pearson and Chalmers systematic review[15]	Comment from participants
(1) Regular tooth brushing with fluoride toothpaste	(13) Development of specifically trained individuals in residential care who are responsible for dental issues such as residents' oral assessments, monitoring the provision of regular oral hygiene care, staff training in oral health issues and organising dental appointments
(2) Drinking and use of fluoridated water in cooking	'The fluoride, regular brushing with fluoride, I think you were doing before'
	'Yeah normal strength'
(3) Application of therapeutic fluoride as an extra-strength 5000 p.p.m. toothpaste, a mouth rinse (in spray bottle) or, application of gel	'I think the drinking and use of fluoridated water probably is a bit of an issue particularly if you have tasted Toowoomba water (laugh) . . . it is not fluoridated anyway'
(4) Reducing intake and frequency of sugar consumption	'Normal strength, the therapeutic stuff if required is put in'
(5) Regular dental check-ups and professional cleaning	
(6) Provision of hands-on oral health training programs for nursing and care staff to improve oral hygiene care provision to residents of residential aged care facilities	'The sugar consumption, the diets are all done up by a nutritionist so all they do is follow the diet that is done up by the nutritionist'
	'Regular dental check-ups and professional cleaning as we said we go out to [Facility B] once a year and we've come up here and done the check-ups'
(7) Use of antimicrobial chlorhexidine gluconate gel or mouth rinse/spray	'The hands-on, we have done the Maintaining Mature Mouths haven't we'
(8) Use of saliva substitutes or regular chewing of sugarless gum where appropriate to reduce xerostomia	'When we did our dental check-up if [dentist] thought they would benefit from the use of that it is added to their care plan'
	'The mouth rinse and the gels happen when people are no longer able to take in the toothpaste'
(9) Regular physical cleaning of dentures, naming of dentures and removal of dentures at night	'The saliva substitute was something really important particularly for the dementia residents and their ears and nose as well, which is really good so our residents mouths are kept moist. And you have got the spray bottles that they are using too. That is easier than getting them to drink'
(10) Use of mouth props and modified dental equipment to help with stabilising the jaw, break chewing or biting reflexes, improving mouth access	'And the dentures are done, we covered that [in the] Maintaining Mature Mouths' 'Both facilities have the naming kit'
	'It is [registered nurse's] responsibility to make sure all dentures are labelled, it is her job'
	'The removal of dentures does happen but that will depend on the person'
(11) Staff to conduct a dental screening assessment and/or completion of a dental examination by a dentist upon residents' admission to facility and regularly thereafter	'The modified dental equipment and the biting blocks are actually really good once they become chair bound . . . usually the end-stage dementia with those because it keeps the mouth open, the block is there to keep the mouth open and makes the cleaning of the teeth a lot easier, and the sponges are a lot easier to get into the mouth than a toothbrush and you are not worrying about having to get them to spit out water and toothpaste or anything else . . . But I mean with the sponges you just have to clean their teeth with them . . . and the nurses actually love . . . the sponges they really like them'
(12) Improved relationships between dental professionals and residential care facility staff to ensure the dental team becomes a part of the residential care team	'It is done for all dementia residents in both [facilities], only

because I did that as part of this, it will happen once the assessment comes back from med records, I have sent it back and it has to go to their next meeting'	issues'
'We have got better relationships between this facility and our facility. I certainly communicate with [oral health therapist] a lot more about oral health	'Development of specially trained individuals in residential care' 'It will because [specifically trained individual] has taught a lot of RNs how to use the tools and will teach all the registered nurses at [Facility B] how to use the oral system tools. So [specifically trained individual] could get hit by a bus tomorrow and they would still be able to do oral assessments and . . . some of them will have had education out at [Facility B] from [oral health therapist] anyway'

Sustainability of project

Participants were able to provide suggestions as to how they could continue with the positive practice changes resulting from the implementation process. First, the oral audit tool would be used by registered nurse staff on a continued basis. This tool was currently being examined by the Queensland Health Medical Records section. Once it had been approved, this tool would be incorporated into facilities' admission procedures. One participant comments about the tool:

> The dental assessment form has actually gone through [Queensland Health Medical Records] too and I am just waiting for it to come back as a permanent assessment tool.

Staff were also able to make a second suggestion about the continuation of evidence-based practice as a result of the implementation. Continued education was identified as a major component in sustainability of practice.

> We will repeat the education next year . . .

Participants also commented on changes to staff orientation as part of sustainability. However, there was a trade-off between the cost of giving all staff members the booklet at orientation and the cost associated with wastage when staff do not continue working at the facility:

> . . . I do those orientations with the staff onsite and if I can find, I have got a stockpile here . . . so I just hand them out to staff, but sometimes you can orientate passionate employees and you can put them through an orientation program and they have to work shifts . . . so it is always that resource cost type payoff.

Participants identified that maintenance of oral health practice changes was important and provided some suggestions as to how positive gains could be maintained:

> I think maintenance is everything too and ensuring that it does continue, that once the hype goes away it doesn't just all fall back . . . It is really great, we all do great things but then we all die down. We sort of forget about that and go on to the next thing.

The final suggestion to facilitate sustainability of gains was the change in work instructions on oral health. These instructions would be audited by the Commonwealth and set as an ongoing benchmark.

Once that assessment tool and work instructions on oral health has been updated as well under the aged care standards, they are being rewritten before March next year.

Discussion

This paper presents a snapshot of an implementation project based in the theoretical framework of continuous quality improvement. There is evidence, within this first cycle of the quality process, to suggest that implementation of oral health best practice was at least partially successful in one of the two facilities.

The strength of data collection in quality cycle approaches comes not so much from having a single, reliable and valid measure with which to measure success, but from having a wealth of data sources, including quantitative and qualitative data. These data may be less precise and may contain more bias but combine to provide the basis upon which judgements of success

are made.[28]

Evidence for the partial success of this pilot implementation is provided from a number of different sources. Before implementation, the level of oral dysfunction in dementia patients was moderate to severe, there was no person designated to management of oral care within facilities or regular assessment of the oral status of patients, there was minimal mention of oral care in care plans and education in oral care was not regularly conducted. Additionally, there was a strong culture of support for change from management and nursing staff.

As a result of the implementation, hands-on oral health training has been provided to many nurses and carers at both facilities. A Clinical Nurse Consultant from one facility has been provided specialised training in oral hygiene practices. Registered nurses from this facility have also been trained in the use of the oral audit tool and a 'tooth-fairy' role has been created to sustain achievements brought about by implementation at Facility A. The inclusion of oral audits in regular care has provided registered nurses with a list of triggers for intervention and referral. Comments from critical reflection suggested increased use of oral swabs and saliva substitutes, improved care of dentures and mention of the use of mouth props in resident care plans in Facility A. Care plans at Facility A are of better quality and more comprehensive than before the intervention.

There also appear to have been changes to practice and outcomes. Staff in one facility have noticed changes in the oral health of residents. The project team, on the basis of expert opinion, did not believe that changes in residents' oral health would arise during the implementation period, primarily because of the short intervention period. To our knowledge, there is no evidence in the literature that an intervention of this type could produce improvements in oral health of older people with dementia in the 6-month timeframe in which the intervention was conducted. Comments provided during critical reflection, however, suggested that improvements in residents' oral health may have occurred. Dental reviews to be conducted 12 months after initial intervention will provide a quantitative back-up to qualitative evidence provided in this paper. Future implementation studies should consider incorporating oral audits post-implementation to examine any short-term influence of changes brought about by implementing best practice.

Measurement issues

From a research point of view, finding adequate evidence that the implementation had been effective in moving oral health management towards best practice at the targeted facilities was not simple. One limitation of the data collection is that, while there is evidence of increased awareness and knowledge of evidence-based practice in relation to oral care and improved oral care documentation at one facility, there is no direct quantifiable evidence of improvement in patient processes or outcomes. The increased quality of care plans at Facility A, however, provides indirect evidence of patient benefit. The Care Plan Rating Tool, partially validated in this project, along with the rating process used in the project, would appear to be a valid means of determining consistency of oral care plans with best practice recommendations. Nelson *et al.* suggest that, where possible, measures should be derived from data sources already available.[47,48] Care plans are already available as part of the accreditation process facilities are required to undertake to gain Australian Government funding, making the data collection and rating process quite inexpensive compared with other potential data sources. The apparent gap between carer knowledge about oral health and pre-implementation shortcomings in oral health practices high-lights the importance of appropriate documentation such as care plans to assist carers in putting knowledge into practice.

Direct observation of oral care behaviours might represent a possibility in terms of measuring changes in process brought about by improvements in oral care plans. A potential issue with this type of measurement is the biases caused by the worker being observed and observer expectancies.[49] While these biases cannot be totally eliminated, they could be minimised by using a well-trained facility employee to take observations and using observers unaware of why observations are being made.[50] The high cost of direct observation, however, may hinder use of this method to measure process changes. Potential future implementations might also consider use of unobtrusive measures of out-comes, such as the purchase of oral care products by facilities. This approach would be comparatively inexpensive and provide good evidence for changes to process and has been used in another recent study as evidence for implementation success.[51]

A concern regarding the validity of data gathered from education questionnaires was the low response rate for post-education questionnaires at both facilities. Bias could be introduced,

for example, by workers with a genuine interest in oral health being diligent enough to return questionnaires. The low response rate appears to have occurred because participants in education sessions were allowed to complete questionnaires after the session and return them at their convenience. A recommendation for future implementations would be to incorporate sufficient time before completion of the final session to enable participants to fill out the post-education questionnaire before leaving that session. Additionally, a possibility in terms of future implementation would be to develop pre- and post-education questionnaires more sensitive to changes in knowledge and attitudes to oral healthcare for patients with dementia and perhaps incorporating a role play examination of techniques prior and subsequent to education sessions.

Finally, it would appear that data collection suffered from care staff not having an understanding of its importance in measuring changes to process and outcome. The importance of these issues should be reinforced at program outset and during implementation to ensure issues of this type are minimised.

Different levels of success across the two facilities

While evidence exists for the effectiveness of implementation at Facility A, similar evidence of success was not observed at Facility B. The challenges faced at Facility B highlight the important role that day-to-day leaders play in championing implementation.[28] The return of the day-to-day leader at Facility B and support from the THSD has meant that recommendations, including training of registered nurses, inclusion of education and oral audits and updating of resident care plans, are likely to occur at Facility B by mid-2006. Future implementations may need to take these issues into account during development of implementation strategies and highlight the importance of having contingency plans for changes to project team structure during the life of the implementation.

The continuous quality improvement approach to implementation in the aged care setting

While the continuous quality improvement approach used in this implementation has its challenges, there are also considerable advantages when it is applied to improving practice in residential aged care. Staff employed in aged care facilities are quite familiar with the concept of quality cycles; the PDCA process is integral to their practice in aged care. This pre-existing knowledge of quality processes provides an excellent milieu for implementation projects such as that reported upon in this paper. Additionally, it assists staff in taking ownership and building confidence in implementing and documenting change that facilitates provision of quality care. Another benefit is increased acceptance and awareness of evidence-based practice recommendations in other areas of aged care and a concomitant increase in enthusiasm to identify other opportunities for implementation of evidence-based practice in facilities. To the extent that similar mechanisms and influences are present in other residential aged care environments, what has been learnt and achieved in this implementation project should be transferable to other aged care facilities.

The critical reflection process was highly valuable, not only in terms of gathering important convergent data for project outcomes but also in terms of facilitating communication between participants on the project and ensuring a progressive move towards best practice at both facilities. It was also useful in providing suggestions to overcome barriers to implementation. There was, however, during critical reflection a hesitance in discussing potential barriers to implementation at more than a surface level. This was in spite of a question specifically addressing barriers and a number of prompts by session facilitators to elicit more information. This may be due to project team members not wanting to minimise project achievements. While this hinders a deeper exploration of barriers and strategies to overcome barriers, it does indicate that clinicians and health workers on the team have taken ownership of the project.

Finally, it must be acknowledged that the critical reflection process is subject to the typical biases associated with qualitative information gained from interviews and focus groups. Qualitative information, by its nature, is subjective and this is a potential limitation of the data collected during critical reflection in this project. However, it is its subjective nature that makes qualitative information rich in detail and valuable in the multi-method approach to measuring implementation success.

Applicability of oral health recommendations for residents with dementia

The recommendations provided in the Pearson and Chalmers systematic review, according to evidence provided in this paper, appear largely applicable to the residential aged care context in which they were applied.[15] This is quite encouraging. There was a general perception during critical reflection, however, that some recommendations may be difficult to implement and/or monitor in the current context. Continued lobbying of local councils to introduce water fluoridation and the addition of the nutritionist to future project teams may assist in future implementation of these recommendations. Additionally, there is a need to recognise that systematic review recommendations need to be tailored to the individual resident, the clinical context to which the recommendation is being applied, and the amount of sup-port provided by services outside residential facilities.

Sustainability of improvements in oral healthcare

Sustainability of the project would appear possible as a result of methods by which the project has been implemented. The MMM program being included in staff orientation, the submission of the oral audit tool for medical record numbering and up-skilling of staff in facilities, the provision of information about oral health status of residents to oral health practitioners and the incorporation of improved practice into facility benchmarks may contribute to future sustainability of gains made from the implementation. It is very important for project sustainability that the role of the person specially trained in oral health and that person's skills be recognised in participating facilities. Additionally, the Commonwealth needs to be wary that benchmarking does not discourage aged care facilities interested in moving towards best practice from being involved in quality improvement processes.

Conclusions

By employing nurses, personal carers, educators, oral health practitioners and researchers, the implementation employed a multidisciplinary approach to improving oral healthcare that appears to have resulted in oral health practices in these facilities moving closer to best practice. Additionally, there is some evidence that these changes may be sustainable and further implementation projects are being planned at these facilities. The majority of recommendations provided in the systematic review of oral healthcare for dementia patients[15] have been found to be applicable, although it is important to recognise that recommendations need to be tailored to the individual resident for whom oral care is being provided and the context in which that care is provided. The overall multi-pronged quality improvement approach used in this project would seem to represent a good base model upon which improvements in evidence-based practice can be made in the residential aged care context.

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