Developing oral health teams in rural Australian residential aged care services

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Abstract

Australia is experiencing an ageing population who are retaining their teeth and needing residential care as they become frail. The health and quality of life of dependent older people are particularly vulnerable to oral diseases that result from poor oral hygiene as they can cause pain, infection, inability to eat and may worsen complications with chest infections and diabetes. Rural Australian older people have substantially worse oral health than their metropolitan counterparts, experience poorer access to oral health care and rural aged care services have limited or no access to outreach dental services. In addition, rural Australia is experiencing significant dental workforce shortages. In order to reduce the demand for dental services and improve aged care residents' health and quality of life, effective prevention and early intervention of oral health problems are essential.

This collaborative project aimed to improve the knowledge and skills of aged care staff at four rural aged care services in Victoria, Australia by developing aged care 'oral health teams' as the basis for improving residents' oral health.

A mixed method approach was undertaken utilising an oral health knowledge, attitudes and practices survey of all aged care staff; 'oral health team' training sessions followed up by hands-on training within the workplace; development of an oral health education and training manual and resource pack; and oral examinations were conducted of all consenting residents.

'Oral health team' training was delivered by a dentist researcher to ten nurses/personal care attendants that focused on provision of effective and efficient oral hygiene care, training in early identification and intervention of common oral problems and training other aged care staff in oral health care. Initial evaluation of this project has shown improved aged care staff oral hygiene knowledge, attitudes and practices and improved oral health and hygiene status of participating residents.

Regular oral health assessments, preventive care and early intervention by aged care staff reduces the need for a dentist to conduct all oral screenings, enables timely referral for oral health care, reduces pain and infection and improves residents' quality of life. This model of oral health care training could build the capacity of the aged care nurses and carers to prevent and provide early identification and management of oral problems in frail aged people, raise awareness of the importance of providing good oral health care among all aged care staff and become allied to the current oral health professional teams.

Introduction

The oral health of older people is of increasing importance as more Australians are living to an older age and maintaining their teeth. The population projections for Australia predict that the proportion of people aged over 65 years will increase from 13% to approximately 25% and those aged over 85 years to increase from 1.6% to approximately 6% by 2056[1]. With an increasing ageing population there will be increased demand for residential aged care services[2].

It is well documented that the oral health of rural older people is substantially worse than their metropolitan counterparts as they are less likely to visit a dentist for a dental problem, more likely to have a tooth extracted than restored, and have longer periods between dental visits[3]. In addition, rural Australia is experiencing significant dental workforce shortages which are unlikely to be alleviated in the near future [4] which makes access to oral health services increasingly difficult. The limited availability of geriatric-specialised oral health services, particularly in rural areas, also contributes to declining oral health in older people, especially those who are dependent on others for their care and wellbeing[5]. Hence, rural aged care facilities have limited or no access to affordable domiciliary or outreach dental services[6-7].

The health and quality of life of older people who are dependent on others for their care and wellbeing are particularly vulnerable to oral diseases that result from poor oral hygiene, such as tooth decay, gum (periodontal) disease, broken teeth, oral infections or ill-fitting dentures. These conditions can cause pain, further infection, inability to eat and may elevate the risk of complications with chest infections (e.g. aspiration pneumonia), diabetes mellitus and functional independence[8]. In order to reduce the demand for dental and specialist services and improve residents of aged care services' health and quality of life, effective prevention and early intervention of oral health problems are essential.

As aged care nursing and caring staff are the front line managers of residents' general and oral health problems, a study was undertaken in four Victorian rural residential age care services that aimed to improve oral health knowledge and skills of aged care staff as the basis for improving oral health in their residents. This paper describes the processes undertaken; the findings and knowledge gained; and makes recommendations for rural aged care services to consider.

Methods

This project was conducted over one year in four Victorian rural residential aged care services. The objectives of the study were:

- to identify oral health education and training needs of aged care staff and develop an oral health training resource
- to assess whether the development of a skilled aged care 'oral health team' can improve aged care staff's oral health knowledge, attitudes and practices and residents' oral health
- oral health education and training needs.

In-depth interviews, focus group discussions and surveys were conducted with aged care staff to identify their oral health educational and training needs. Transcripts and summaries of interviews and focus groups were approved by the interviewees prior to analysis. Thematic analysis examined key themes and emerging issues.

Development and impact of aged care 'oral health teams'

Aged care staff at each site were invited to volunteer to be part of a workplace-based oral health and hygiene training program to become an 'oral health team' member. These staff attended a one-day education and training session and were accompanied by the training dentist during their routine work in order to provide practical hands-on training. Pre- and post-intervention surveys were conducted with the oral health team members to assess the impact of training on their knowledge, attitudes and practices. Pre- and post-intervention oral examinations were conducted on consenting residents to assess the impact of training on their oral health status, particularly oral hygiene.

Oral health training resource

Information obtained from the surveys, focus group discussions and evaluation of the oral health team training formed the basis for the development of an oral health training resource pack for aged care staff.

Oral examinations

Detailed oral examinations were conducted on consenting residents by a dentist trained in a standardised methodology. Information was obtained in relation to health of the soft tissues (lips, cheeks, palate, tongue, floor of mouth); saliva flow; plaque levels, tooth status; denture hygiene and function; and need for immediate

care and treatment. On completion of the oral examination a written report was provided to the aged are service's nurse unit managers for follow-up action.

Ethics approvals

Approvals from Monash University Human Research Ethics Committee were obtained for all phases of this project. Informed consent was obtained from all participants. If a resident was unable to provide informed consent, a letter and explanatory statement was sent to the person responsible for their care to obtain consent.

Results

Oral health education and training needs

Interviews and focus groups

The participants reported a number of key issues that impede the provision of oral health care. Access to dental services is challenging—it is difficult for dentists to visit the aged care services due to dental workforce shortages and limited skills in delivering geriatric-specialised oral health services. In addition, staff have to overcome mobility and transport issues when taking residents to external dental services. Often oral problems are managed by a visiting doctor instead of a dentist. Nurses were aware that poor oral health can impact on residents' general health and quality of life; however, it is difficult to manage residents with advanced dementia as they can exhibit difficult and resistive behaviours, they may be unable to spit or swallow, or cannot communicate about their condition. Staff reported that they did not know enough about oral health to identify problems and they required further skill development identifying oral health problems, and managing toothbrushing and dentures in residents who exhibit challenging behaviours.

Survey

The knowledge attitudes and practices survey was completed by 97 staff members across the four sites (response rate 52%). The respondents were predominantly female (95%) and were divided among Division 1 nurses (29.9%), Division 2 nurses (39.2%) and personal care attendants (30.9%). They were predominantly aged over 41 years (79.4%) and had worked in aged care for more than one year (90.8%) of which 72.2% had worked longer than five years.

More than half of the respondents (61%) reported having had previous **oral hygiene** training (training in helping aged care residents keep their mouths clean, which includes teeth, gums and dentures) but less than half (45.4%) reported having had **oral health** training (training in the causes, management and prevention of oral diseases, such as tooth decay, gum disease, thrush or ulcers).

The survey explored general knowledge about common oral health conditions and oral hygiene tasks that are most frequently experienced or provided in residential aged care. General knowledge about the causes and signs of tooth decay was very good—frequent intake of sugary food and drink, poor oral hygiene and a dry mouth. However 62% of respondents thought that lack of calcium in the diet was a cause of tooth decay, which is a common fallacy.

The majority of respondents had a good understanding of how tooth decay can be best prevented (i.e. regular toothbrushing, limit sugar intake, use of fluoride). Although approximately 33% of respondents thought chlorhexidine would be effective, however, this is effective for managing the symptoms of gum disease but not tooth decay. The majority of respondents understood the main causes (bacteria in plaque and poor nutrition) and signs of gum disease but nearly half of them thought that sugar was a main cause of gum disease, which it is not.

The respondents had good knowledge of denture care and maintenance. The question which highlighted the greatest difference in opinions was regarding whether dentures should remain in the residents' mouth overnight whilst sleeping—almost half of the respondents reported 'no' but approximately 22% selected 'yes', 13% stated that it should be based on 'resident request' and 16% 'did not know'. Nearly 95% of respondents stated that water in denture containers should be changed daily, but they were split on how often denture

containers should be replaced: nearly 50% stated weekly, but approximately 16% each thought monthly or when needed. This varied substantially across sites, and may be due to policy differences.

Nearly two-thirds of the respondents were aware of how a dry mouth can increase the likelihood of developing tooth decay and nearly 75% responded that residents should be checked for dry mouth daily. Approximately 76% of respondents thought that residents should have an annual check-up by a dental professional and 10% thought residents should have a check up when needed.

Oral health team training

Across the four sites, ten aged care nurses and personal care attendants volunteered to become 'oral health team' members. All participants completed a pre-training survey but only seven completed the post-training survey due to staffing changes. Most of the nurses (75%) and none of the personal care attendants had undertaken some form of oral health/hygiene training prior to this project. General oral health knowledge was very good at commencement of the project and there were only a few areas where improvement was identified: practical techniques and confidence in managing residents' oral health problems. The areas that needed attention were improving understanding of basic oral disease processes, diagnosing and managing dry mouths; managing people with their own natural teeth, conducting oral health assessments and developing oral hygiene care plans.

Oral health information training sessions provided theoretical training on:

- impact of oral health on general health and quality of life
- the susceptibility of residents to oral health problems
- common oral diseases or conditions (tooth decay, gum disease, abscesses, cancerous lesions, dry mouth, ulcers, and candidiasis)
- infection control
- caring for natural teeth, dentures and managing common problems
- techniques for managing resistive behaviour
- oral health assessment
- oral health care planning
- useful oral hygiene.

The oral health training sessions also coached the oral health team in practical aspects of providing oral hygiene care in a gentle, safe and effective manner. For example, they practiced toothbrushing, applying fluoride and chlorhexidine medicaments and conducting oral health assessments on each other before undertaking oral health care with the residents.

After this initial training, the researcher returned to each residential aged care service to accompany each oral health team member as they conducted oral health assessments, developed oral hygiene care plans and implemented oral hygiene care to the residents. A validated systematic oral health assessment tool[9] and oral health care plan[10] were utilised to train the oral health team members.

Post-training surveys indicated improved understanding of the signs and symptoms of tooth decay and gum diseases. There was raised awareness of the use of chlorhexidine mouthwash for managing gum diseases, but some confusion occurred when more oral health team members thought that it could prevent tooth decay. Chlorhexidine does help control gum diseases but does not help to prevent tooth decay.

Development of oral health training resource pack

During the development and implementation of this project an oral health information and training manual was developed. The final training manual covers all the theoretical aspects of the training including the oral health assessment tool[9], and the oral health care plan tool[10] and where to source oral health products.

Oral examinations of consenting residents

Demographics

Oral examinations of consenting residents were conducted six-monthly over the project period, 74 at baseline and 57 at follow-up. Table 1 summarises the demographic characteristics of the participants.

Table 1 Demographic data of oral examination participants

Demographics	Baseline (n= 74)	Follow-up (n= 57)
Mean age [Range, SD] (years)	83.4 [59-104, 9.3]	83.9 [59-99, 8.9]
Female (%)	63.6	66.7
Aged 85 years + (%)	44.5	50.9
Edentulous (no natural teeth) (%)	63.5	64.9
Residents in low care—hostel (%)	41.9	47.4
Residents in high care—nursing home (%)	58.1	52.6
Primary physical disability (%)	62.1	47.3
Primary cognitive disability (%)	35.1	47.3
Confined to bed (%)	17.6	14.0
Use a wheelchair (%)	23.0	24.6
Use a walking frame (%)	31.1	31.6
Ambulant (%)	28.3	29.8

Oral examination findings

At all examinations a range of participants were found to have some form of oral pathology in their mouth that required treatment or referral (Table 2). The most common pathologies were oral candidiasis (thrush), denture related ulcers, denture stomatitis and geographic tongue.

There was a notable decrease in the proportion of participants with dry mouths or poor saliva flow (Table 2). Participants were evenly divided between the nursing homes and the hostels.

Table 2 Presence of soft tissue pathology and assessment of saliva quality

	Baseline (n= 74)	Follow-up (n= 57)
Soft tissue pathology present (%)	43.0	42.0
Saliva quality		
Moist (%)	58.1	75.4
Dry, sticky, parched (%)	42.0	24.6

Plaque levels in people with natural teeth were assessed as: (1) light film of plaque, (2) moderate accumulation of plaque, and (3) abundance of plaque on index teeth representing upper and lower front and back teeth. Data analysis showed that people who were confined to a wheelchair or bed had higher plaque levels (moderate to abundant accumulations) on front and back teeth compared with those who were mobile. The proportion of residents with abundant levels of plaque reduced from approximately 33% to 18%, however the majority of the residents with high plaque levels were in the nursing homes. The increased levels of plaque caused more severe bleeding gums in residents, especially those confined to bed.

Denture hygiene in these aged care services was good and improved during the project (Table 3).

Table 3 Assessment of denture hygiene (plaque levels)

	Baseline (n= 74)	Follow-up (n= 57)
Upper denture hygiene		
<25% of the denture surface coated in plaque (%)	47.3	57.9
>25% of denture surface coated in plaque (%)	30.0	10.5
Lower denture hygiene		
<25% of the denture surface coated in plaque (%)	35.1	43.9
>25% of denture surface coated in plaque (%)	30.0	7.0

The oral examinations revealed high levels of follow-up treatment needs but levels of urgent treatment (immediate care) were much lower (Table 4). Common follow-up treatments required were denture adjustments, application of dry mouth gel or fluoride gel, fillings, treatment for oral candidiasis (thrush), scaling of calculus buildup, tooth extractions, assistance with denture care and oral pathology review. Common causes of need for immediate care were pain, infections, and loose teeth.

Table 4 Levels of need for immediate care and follow-up treatment

	Baseline (n= 74)	Follow-up (n= 57)
Need for immediate care (%)	9.5	12.2
Need for treatment (%)	52.7	42.1

Discussion

This study highlighted numerous issues that challenge residents, nurses, and carers in the daily management of oral health care for older people living in residential care. These problems included: complex, multiple oral problems; poor access to oral health services; difficulty in providing appropriate care in people with cognitive or behavioural difficulties; limited understanding of oral diseases; and limited access to ongoing training for aged care staff.

In order to address these issues, the project aimed to train aged care nurses as oral health team members who had a more in-depth knowledge of oral health care; could undertake comprehensive oral health assessments and develop oral health care plans that focused on disease prevention and early intervention. They could also manage residents with more complex needs or challenging behavioural/cognitive difficulties; and could provide ongoing mentoring and training to other aged care staff.

The oral health knowledge attitudes and practices survey indicated that the majority of nursing and caring staff had a good understanding of basic oral health care (knowing the causes of tooth decay and gum disease; and how to clean dentures) but lower understanding of how these dental diseases can be prevented or managed (particularly in the aged care setting); or how to use many useful oral health care products. It is difficult to determine the level of response bias as only approximately half of eligible staff responded to the survey and the characteristics of non-responders was not able to be determined. It is possible that the survey was predominantly completed by those people with confident oral health literacy and avoided by those who did not have an interest in oral health care.

The respondents had good knowledge of denture care and maintenance but a difference of opinion was obvious as to whether dentures should remain in the mouth whilst sleeping. The current evidence indicates that leaving dentures out for some time during a 24-hour period is beneficial to oral health (reduces risk of infections and ulceration)[11] and, in general, it is most convenient to leave them out when sleeping, so aged care services should encourage this practice.

The oral examinations of consenting residents, who represented about 40% of the total service resident population, indicated that oral health for most residents is very good. The most significant oral health problems for people who were edentulous (no teeth) related to ill-fitting dentures and wearing dentures

constantly. Saliva quality improved over the period of the study, but more in-depth research would be required to determine what factors led to this change.

Plaque levels provide us with an insight to the effectiveness of oral hygiene care as plaque accumulates after about 12 hours of 'no brushing'. In this project, plaque levels reduced among the dentate people and were evenly experienced across the nursing home and hostel residents, although nursing home residents experienced higher levels of plaque overall compared with hostel residents. Plaque was found to accumulate mostly around the lower teeth at baseline and follow-up examinations. These areas are often the most difficult to clean especially for those who have limited ability to manage their own brushing. Assessment of denture hygiene found an improvement in plaque and calculus levels on dentures, both in the nursing homes and the hostels.

The amount of treatment needed that emerged from these oral examinations reflects the high oral health care need of older people living in residential aged care. Follow-up care did not necessarily need to be provided by an oral health professional—some was to be implemented by the oral health team members as part of an oral health care plan.

The oral health team participants demonstrated good knowledge of basic oral health knowledge at baseline and there was little change in knowledge, except for an improvement in knowing the signs and symptoms of tooth decay and gum disease and how to best prevent these diseases.

From these findings, the following recommendations are made. Rural aged care services should establish and maintain oral health teams and ensure they are appropriately supported, have time allocated to conduct oral health assessments for all residents and attend professional development as required. All residents should have an oral health assessment and care plan on admission and these should be reviewed when general health care plans are reviewed. Oral health teams should provide annual oral health training to other aged care staff to build service oral health capacity. Management should develop clear referral pathways between the aged care service and local dental services to ensure residents can access timely and appropriate care. Dentists should be invited and encouraged to visit aged care services to ensure more complex oral conditions are identified and managed appropriately.

Conclusion

Many of the residents who are residing in aged care services have complex physical health needs compounded by declining cognitive states. If oral health care is not maintained or managed, then avoidable oral health problems can contribute to worsening of residents' health status and have adverse impacts on residents' quality of life [8]. Aged care staff are the front line managers of residents' general health care and so it is vital that they are adequately equipped with basic skills to prevent and manage oral health problems. This project has shown that providing nurses and carers with knowledge and basic skill development, oral health care across an aged care service can be improved. The dissemination of these oral health team members' knowledge, skills and values to other aged care staff contributes to raising awareness of preventing and managing oral problems.

The geographic, financial and workforce shortage barriers to accessing 'traditional' oral health care in rural areas are not likely to disappear within the near future [12-13], hence this intervention provides improved oral health care to one of our most vulnerable groups in our community and is a step towards achieving the goals in Australia's National Oral Health Plan [14] by proactively addressing two Action Areas "Older People" and "People with Special Needs".

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References

1 Australian Bureau of Statistics. 3222.0—Population Projections, Australia, 2006 to 2101 2011.
2 Department of Health and Ageing. Ageing and aged care in Australia. Canberra: Commonwealth of Australia, 2008.
3 AIHW Dental Statistics and Research Unit. Oral health care and access to dental care—rural and remote dwellers, Research Report No. 20. 2005.
4 Chrisopoulos S, Teusner DN. Dentist labour force projections 2005 to 2020: the impact of new regional dental schools. *Australian Dental Journal* 2008; **53:** 292-296.
5 Chalmers JM. Geriatric oral health issues in Australia. *International Dental Journal* 2001; **51:** 188-199.
6 Hopcraft M, Morgan MV, Satur JG, Wright FAC. Dental service provision in Victorian residential aged care facilities. *Australian Dental Journal* 2008; **53:** 239-245.
7 Paley GA, Slack-Smith L, O'Grady M. Oral health care issues in aged care facilities in Western Australia: resident and family caregiver views. *Gerodontology* 2009; **26:** 97-104.
8 Meurman JH, Hamalainen P. Oral health and morbidity—implications of oral infections on the elderly. *Gerodontology* 2006; **23:** 3-16.
9 Chalmers JM, King PL, Spencer AJ, Wright FAC, Carter KD. The Oral Health Assessment Tool—validity and reliability. *Australian Dental Journal* 2005; **50:** 191-199.
10 Chalmers JM, Spencer AJ, Carter KD, King PL, Wright C. Caring for oral health in Australian residential care. In: AIHW Dental Statistics and Research Unit, (ed.) *no48, CatDEN 193*. Canberra: AIHW, 2009.
11 Pearson A, Chalmers JM. Oral hygiene care for adults with dementia in residential aged care facilities—systematic review. In: The Johanna Briggs Institute, (ed.) *JBI Reports*, 2004.
12 Australian Research Centre for Population Oral Health. Geographic distribution of the dentist labour force. *Australian Dental Journal* 2005; **50:** 119-122.
13 Australian Research Centre for Population Oral Health. Oral health and access to dental care—rural and remote dwellers. Adelaide: AIHW Dental Statistics and Research Unit, 2005.
14 National Advisory Committee on Oral Health. Healthy mouths, healthy lives—Australia's National Oral Health Plan 2004-2013. Australian Health Ministers' Conference, 2004.