Article

An intervention to improve the oral health of residents in an aged care facility led by nurses

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Abstract

Introduction: The growing population of elderly people is impacting on overstretched dental services in many countries, as many individuals are retaining natural teeth and may have dentures or implants, all of which influence the way in which the oral cavity must be cared for. A major difficulty for older residents is their decreasing level of motor and cognitive functioning to adequately self-care for their mouths. Hence, the role of the nurse is crucial. However, staff shortages, time factors and lack of awareness can lead to neglect of the mouth in this population. The loss of function is often exacerbated in individuals with mental health problems.

Objectives: To improve the oral health of residents in an aged care mental health unit through the introduction of an innovative nursing intervention.

Methods: Firstly, utilizing focus groups, nursing staff identified the main barriers to delivery of oral hygiene to residents as follows: lack of proper equipment; no protocol in place; lack of knowledge. Staff knowledge of oral health and hygiene was measured using a structured questionnaire before and after the intervention. A training program was devised by a dentist, dietician and nurse working in the unit. A multidisciplinary team met on several occasions to design a suitable vehicle and process to deliver oral hygiene. Oral health examinations were conducted at baseline, three months and 12 months.

Interventions: Design and production of oral hygiene trolley; development of protocol for oral hygiene; staff education in oral health.

Results: The program was successful in improving the oral health of residents with reductions in plaque scores, gingivitis and pocket depths. The oral hygiene protocol was positively accepted into a daily routine and the knowledge of staff in matters relating to oral health increased.

Conclusions: A simple oral health intervention utilizing qualified nurses and a purpose-built oral hygiene trolley made significant improvements to the oral health of aged care residents.

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Introduction

The provision of dental care to elderly residents living in residential aged care facilities (RACFs) and specialized hospitals is a huge challenge for both health care planners and the dental profession. Not only are adults over 65 years of age a growing section[1] of the community, but the decreased rate of tooth loss means older people are retaining more teeth. These standing teeth are at risk of dental caries and periodontal disease. In addition, poor oral health is linked to effects on systemic health,[2,3] which highlights the importance of maintaining older people dentally fit.

Older people living in RACFs have some of the poorest dental health in Australia and there are significant barriers to readily access clinical care.[4] These include poor working conditions for staff in nursing homes, the patients' cognitive and physical disabilities, dependence on others to provide oral hygiene, polypharmacy and a lack of dental staff who are prepared to offer clinical treatment.[5,6]

Poor dental health, particularly plaque-related periodontal problems, is certainly impacting upon the general health of older residents. The key health issues influenced by poor oral health are cardiovascular disease, diabetes and atherosclerosis.[7–9] Aspiration pneumonia is also a serious problem for elderly residents of aged care facilities. High levels of dental plaque in the mouth exacerbate the risk for pneumonia, which highlights the importance of daily tooth cleaning.[10,11]

A number of research studies have investigated the provision of oral hygiene care in nursing homes. The consensus view is that oral care is frequently delegated to untrained staff members, and even if training is offered the turnover of unqualified staff is so great that education programs are of little value.[12–15] Less well educated staff tend to view oral health care as demeaning and repulsive.[16]

These findings are of great concern, as many residents of nursing homes depend upon the ancillary staff for the provision of oral hygiene care.

One potential solution is to bring daily oral hygiene care within the scope of care of qualified nurses and ensure it is core business. The qualified staff turnover in residential homes is less than unqualified staff, so their long-term potential to effect change is possible.

The current study is focused on working with a multidisciplinary team to identify how oral care could be embedded within the core nursing duties and then to implement a pilot scheme to test the feasibility and sustainability of the intervention.

Methodology

The nurse unit manager of a large hospital in the centre of Sydney, NSW, whose primary role is to care for the frail elderly, particularly those with mental health problems, was asked to join in this investigation. The research plan had three components:

1. problem definition;
2. potential solutions;
3. piloting an agreed solution.

The multidisciplinary team consisted of a nurse, dentist, dietician and a cross-infection control officer. The hospital had nine large wards and all of the qualified nurses were asked to participate in one of five focus groups. These were arranged on different days to ensure maximum participation. The focus groups were taped and two investigators individually listened to and identified recurrent themes. The two then met and compared results and highlighted core problem issues.

The nursing staff identified three main barriers to the implementation of an oral hygiene program for their residents.

1. There was no agreed protocol on oral hygiene and it was not included within a nurse's job description. Tooth cleaning was often designated to unqualified assistants who change jobs frequently.
2. There was a lack of proper oral hygiene equipment. The storage of resident's toothbrushes was haphazard and the timing of tooth brushing was highly variable.
3. Nurses had little knowledge of oral health and the relevance of good oral hygiene.

Following the focus groups the multidisciplinary team met once more to consider the problems and propose a solution that could be implemented and tested. Firstly, the nurses prepared an oral hygiene protocol that was aligned to the key activity of dispensing drugs. Each ward has a drugs trolley and at set times during morning, early afternoon and evening designated nurses are rostered to dispense medication and complete the register. The team recommended that an 'oral hygiene' trolley could be established and used in a similar fashion, which would bring coherence and importance to the exercise. The paperwork for undertaking oral hygiene was similar to that for the medication round, with the designated nurse being required to sign off when oral hygiene had been completed for each resident (Figure 1); the oral hygiene care plan varied for individual clients dependent upon oral health status, presence of dentures and dryness of mouth. The advantages of embedding oral hygiene in this way are that it would be a core activity for qualified nurses and all of the equipment would be in one place. In addition, the nursing advisory team requested an education program on oral health.

One ward was selected to test a trolley-based system. The intervention was structured as follows.

1. Design and construction of purpose-built oral hygiene trolley. The trolley was designed to be a 'one-stop-shop' housing individual compartments for each resident, containing all oral hygiene products necessary to provide oral health care necessary for the dental status of each resident (Figure 2).
2. A ward-level oral hygiene protocol and process. A protocol and process for how the oral hygiene trolley would operate was devised and agreed by the team (Figure 3).
3. Oral health education program for all qualified nursing staff – monitored through pre- and post-education questionnaires.
4. Oral hygiene measurements of the patients on the test ward at baseline, three months and 12 months.

The three standard periodontal parameters used were those of Silness and Loe.[17] Six index teeth were selected (the Ramfjord teeth), four from the posterior region and two from the anterior region.

Name sticker																											
	Year				**Date & month**																						
Brush gums 2 × daily	AM																										
	PM																										
Brush teeth 2 × daily with toothpaste	AM																										
	PM																										
Swab 1 × daily with Biotene mouth rinse	AM																										
	PM																										
Apply lip & mouth moisturizer	AM																										
	PM																										
Brush dentures 2 × daily with soap & water	AM																										
	PM																										
Store denture over night in water	AM																										
	PM																										
Soak dentures in chlorhexidine for 15min, 2 × daily for 12wks	AM																										
	PM																										
	PM																										

Figure 1. Oral hygiene paperwork

The plaque index

The plaque was scored as follows.

Score 0 = no plaque.

Score 1 = a film of plaque adhering to the free gingival margin and adjacent area of the tooth. The plaque may be seen in situ only after application of disclosing solution or by using the probe on the tooth surface.

Score 2 = moderate accumulation of soft deposits within the gingival pocket, or on the tooth and gingival margin, which can be seen with the naked eye.
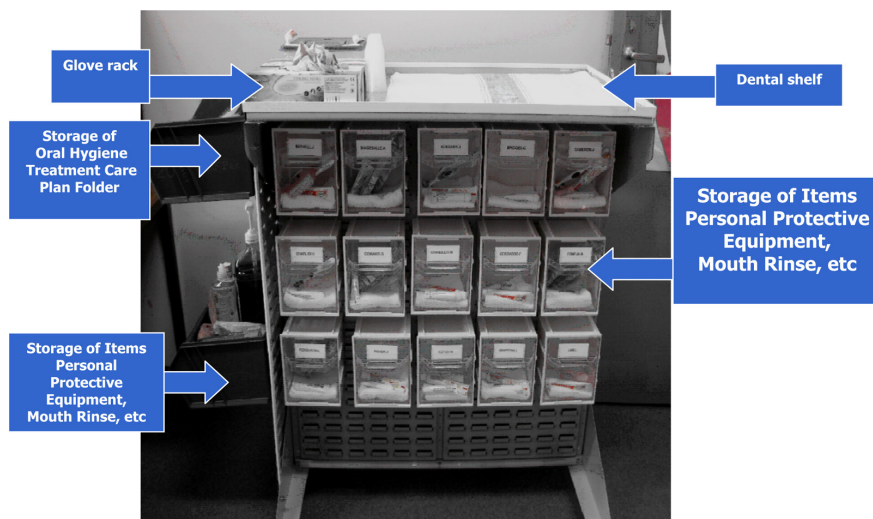
Figure 2. Oral hygiene trolley

Score 3 = abundance of soft matter within the gingival pocket and/or on the tooth and gingival margin.

The gingival index

The gingival index was recorded as follows:
Score 0 = absence of inflammation;
Score 1 = mild inflammation; slight change in colour and little change in texture;
Score 2 = moderate inflammation; moderate glazing, redness, oedema and hypertrophy; bleeding on pressure;
Score 3 = severe inflammation; marked redness and hypertrophy; tendency towards spontaneous bleeding; ulceration.

Pocket depth

Pocket depth was determined by using a Williams periodontal probe. The mesial, buccal and distal aspects were measured to the nearest millimetre on the six Ramfjord teeth in both jaws. The data were recorded by a trained dental assistant. Denture cleanliness was scored on a visual basis.
Four ranked scores were used:
Score 0 = no visible plaque;
Score 1 = plaque visible only by scraping on the denture base with a blunt instrument;
Score 2 = moderate accumulation of visible plaque;
Score 3 = abundance of plaque.
    The value of the oral hygiene trolley and its link to the drug trolley protocol was assessed by interviewing staff on the ward. The views of the residents of the ward were also sought by asking three key questions as follows.

Q1. Do you like the oral health trolley?

Q2. Are you finding that your mouth and teeth are cleaner then before the oral health trolley was introduced?

Q3. Are you finding it easy to use?

They were asked to score each question from 1 to 10, with 10 being the most positive and 1 being the most negative score.

Reproducibility

The examiner's ability to reproduce reliable scores was assessed. Consistency of scoring was assessed by comparing the readings of 12 registration points in the anterior segment in both upper and lower jaws with a one-week interval. It was noticed that the inconsistent scores for plaque and gingival indices were not more than one score and 1 mm for the pocket depth.
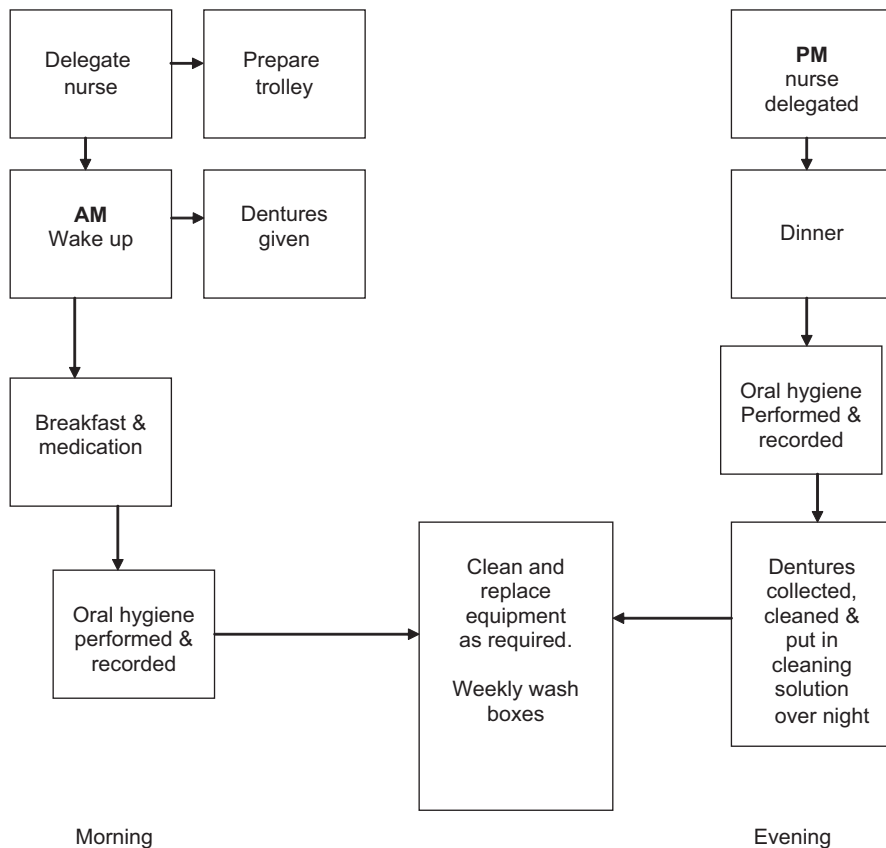

Figure 3. Process and protocol for oral hygiene

Table 1. Mean plaque, gingivitis and denture cleanliness scores at baseline, three months and 12 months

	Baseline	3 months (% reduction)	12 months (% reduction)
Mean Plaque score	2.57	1.27 (51%)	1.32 (49%)
Mean gingivitis score	2.68	1.76 (34%)	1.17 (56%)
Mean denture cleanliness score	2.5	0.5 (80%)	0.5 (80%)

Table 2. Differences in pocket depth over the 12-month study period

	Baseline	3 months (% reduction)	12 months (% reduction)
Mean pocket depth	5.6	4.4 (27%)	3.8 (32%)
Number of pockets greater than 2 mm	96	32 (67%)	28 (71%)
Number of pockets greater than 4 mm	88	14 (84%)	9 (90%)

Results

The ward chosen at random was one of the smaller ones in the hospital caring for elderly residents with mental health problems. There were 30 residents, of whom 10 had full dentures and two residents were unable to have a dental examination because of behavioural problems. The dentate individuals had a mean of 16 standing teeth with a range of 5–32.

At baseline the mean visible plaque and gingival index scores were recorded and Table 1 shows that the mean plaque score was 2.57, with a range between 2 and 3, whilst the mean gingival index score was 2.8 (range 1–3). The mean denture cleanliness score was 2.5 and ranged from 2 to 3.

At three months, Table 1 shows that the visible mean plaque score had decreased from 2.57 to 1.27, a reduction of 51%, and gingival index scores had reduced by 49%. Denture cleanliness scores also demonstrated a marked improvement with a reduction of 80%.

The final oral health examination took place 12 months after the introduction of the intervention (Table 1) and demonstrated maintenance in relation to plaque (49% reduction) and some further improvement of the health gain with respect to gingivitis (56% reduction). Denture cleanliness scores did not show a difference between three and 12 months, but the initial improvements were maintained.

Mean pocket depths were calculated and once more marked improvements were seen in both the mean pocket depth and in the number of pockets measuring greater than 2 mm (Table 2) over the period of the study. The 67% reduction achieved at three months in the number of pockets greater than 2 mm in depth was maintained at 12 months with a 71% reduction.

Nurses from the ward attended an oral health education program that focused on reasons for brushing teeth and gums, the links with systemic disease and the need to refer patients with oral pathology. The pre-program questionnaire consisted of eight questions and the mean number of correct responses was 4.4; 16 weeks after attendance at the education program the mean number of correct responses was 7.9. The nurses also reported in a free text section that they had gained a greater understanding of the role of oral health on general health.

In the final part of the evaluation the nurses working on the ward were asked to comment on the oral hygiene trolley and the link to the drug round. There was universal praise for the oral hygiene

trolley and recognition that having the nurse taking the leading role had embedded oral hygiene within the ward routine.

The ward residents were most enthusiastic about the 'oral health trolley', with mean scores ranging from 8.6 to 9.2 out of a possible maximum of 10.

Q1. Do you like the oral health trolley? (Mean score 9.2.)

Q2. Are you finding that your mouth and teeth are cleaner then before the oral health trolley was introduced? (Mean score 9.0.)

Q3. Are you finding it easy to use? (Mean score 8.6.)

Although not directly included in the evaluation, the Hospital Cross Infection Control Officer noted a large reduction in the number of prescriptions for antibiotics on the study ward compared with other wards on the hospital site. In previous years, antibiotic usage was very similar across the hospital campus.

Discussion

This study is only a small pilot and cannot be generalized to other wards or institutions. Nevertheless, the intervention was designed and implemented by the nursing professionals, who offered a plan whereby oral hygiene was embedded within the ward regime. In addition, the nurses were in charge of the program and did not delegate it to unqualified staff, many of whom changed jobs frequently.

After the 12 months of the program the oral hygiene protocol was being maintained. The teeth and dentures were brushed twice daily. Patients with persistent angular cheilitis, denture stomatitis, poor-fitting dentures and those complaining of pain were referred to the NSW Public Dental Service. The major expense was the oral hygiene trolley, which cost $1000 Australian Dollars, but it was purpose built, well made and the nurses found it very easy to manoeuvre and use. Following positive feedback from nursing staff and the success of this program, other wards in the hospital are now participating in the scheme.

Establishing a new clinical practice in a busy and often understaffed ward for elderly patients is a challenge. The nurses in our study were under great emotional pressure, as meeting the demands of individuals who had intellectual as well as medical issues was physically demanding. The oral hygiene routine was seen as an important task following the educational input regarding the relevance of good oral health and it fitted 'neatly' into the drug trolley routine. The nurse unit manager did complain about the lack of clinical dental services and the need for the dental professionals to give specific advice. Improving oral health was viewed as a partnership between two groups of health professionals, but input from the dental team was seen as limited and somewhat difficult to access. There may well be a role for greater use of dental therapists and hygienists to take on part of the clinical role of the care of elderly patients, but this will require national changes in Australia to the scope of practice. As the population of elderly people is increasing, these changes in clinical practice should be given a high priority by the Dental Board of Australia in order to ensure timely and effective care for older people. Of great interest in this particular study was the fact that the brushing program was associated with a reduction in the number of prescriptions for antibiotics in the ward receiving the program.[18] The study did not include this issue, but the changes in patients with respiratory infections over the winter period was obvious to staff and should be included in a further investigation.

Conclusion

Aligning oral hygiene within a well-established ward routine was acceptable to the nursing profession and improved the oral health status of elderly patients.

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Conflict of interest statement

The author(s) declared no conflicts of interest with respect to the authorship and/or publication of this article.

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