

Effectiveness of health care worker training on the oral health of elderly residents of nursing homes

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Abstract - Objectives: The aim of this study was to evaluate the effect of a staff training programme on mouth care on the oral health of elderly residents of long-term care institutions. Methods: Seventy-eight residents of five long-stay institutions were enrolled and underwent a baseline oral health assessment. Staff caring for residents in three of the sites received intensive training in mouth care. This comprised lecture and video material complemented by clinical demonstrations. The oral health of residents at all five sites was reassessed at periods of 3 and 9 months. Staff caring for residents in the remaining two institutions were then provided with mouth care training and all patients were reassessed at 18 months. Statistical analyses were undertaken to examine for significant changes in selected oral health parameters after training, within each group. Results: Oral mucosal disease and oral dryness were common at baseline. The staff training was well received. Following staff training, there was a significant reduction in the number of residents left to undertake their own oral care. There were significant improvements in denture hygiene and a reduction in the number of residents wearing dentures overnight. The prevalence of oral mucosal disease dropped, with significant reductions in angular cheilitis and denture stomatitis. Conclusion: This education programme was effective in changing oral health care procedures within longstay institutions for the elderly, with measurable improvements in oral health of the residents.

Ageing has become an important political issue in developed countries. The fastest growing section of the British population comprises those over 75 years and, as a result, the structure of the population is changing to one in which older people will outnumber children. Among the elderly, overall rates of disability rise steeply after 70 years, with the most severely disabled living mainly in residential or institutional care (1). Furthermore, there is an increasing number of elderly dentate patients, with 50% of 75-year olds currently retaining some natural teeth (2). Oral mucosal lesions are also common among the elderly (3, 4). These factors will have a major

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impact on delivery of oral health care in the future.

Maintenance of oral hygiene and provision of mouth care are considered basic but essential nursing interventions (5–9), especially for elderly institutionalized patients, who have higher levels of oral disease than those living at home (2, 10–15). However, several studies have shown that the provision of dental care for this group is inadequate (16), with treatment often sought only when patients experience pain or denture problems (14, 17). Few care homes arrange dental assessment on admission or organize annual dental screening and most do not have care plans that include the mouth (14). Furthermore mouth care is frequently delegated to untrained care assistants (18–20).

Nevertheless, nurses and other health care workers have the potential to play a crucial role in the provision of oral care for dependent elderly people and it is essential that multi-disciplinary teamwork is encouraged (21, 22). A lack of training about oral health and disease in both undergraduate and postgraduate nursing curriculae has been identified as a major barrier to providing adequate oral care (19, 23–25). Oral health education programmes offered to care staff can positively affect their ability to perform oral hygiene procedures (26-28). In addition to theoretical knowledge, practical training should also be included (11, 29-31). However, Simons et al. (32) highlighted the rapid turnover rate of poorly paid nursing assistants as a barrier to providing training in care establishments.

Several published studies have evaluated the effectiveness of oral care training programmes delivered to the carers of dependent elderly persons but not all have demonstrated a positive effect on staff ability to perform oral hygiene procedures and on patients' oral health (26–28, 32–35). Clearly, promoting change in practice is a complex issue, with factors such as personnel attitude to oral care having to be addressed (36).

This paper describes a controlled interventional study to measure the effectiveness of a comprehensive oral health educational programme provided for nurses and carers of institutionalized elderly residents in a small town, in a remote area of northern Scotland.

Materials and methods

Ethical approval for the study was obtained from the Ethics Panel of Highland Primary Care NHS Trust, Inverness, Scotland, UK.

Patients and staffing

The study population of 78 dependent patients was resident in three nursing homes and two long-stay hospitals located in Wick, Caithness, Scotland, UK. Both nursing homes and the long-stay wards were fully staffed with qualified nursing staff and untrained auxiliary staff, the latter forming the largest staff group in both facilities.

Study design

The study was designed as a controlled interventional study. The cohort of patients was divided into two study groups. Group I comprised 39 patients residing in a long-stay hospital ward and two nursing homes; Group II consisted of 39 patients residing in a long-stay hospital ward and one nursing home.

Inclusion criteria dictated that patients must be resident in the nursing home/hospital ward, co-operative and able to give informed consent. The small number of patients unwilling to participate or who lacked sufficient co-operation or understanding were excluded. Each participant provided written or witnessed verbal consent, following discussion with the principal investigator (R.N.) and, if they wished, relatives.

Timetable for oral assessment of patients

A baseline oral health assessment was carried out on all patients, before any training was provided to carers. Training on oral care was then provided for staff in the group II homes only. The oral assessment was repeated at intervals of 3 and 9 months after completion of the educational intervention in group II and at the same time intervals for those in group I. After assessment of all patients at 9 months, training was provided to carers of patients in group I and a final oral health assessment of all participants was performed 18 months after the initial baseline examination.

Oral assessment data collection

The oral cavity was examined under standardized conditions utilizing a portable Daray[®] light (Daray Lighting Ltd., Leighton Buzzard, UK) and two dental mirrors. Data were recorded on a standard proforma designed specifically for use in this study.

At baseline, demographic details and medical, dietary and smoking histories were collected from each patient. In addition, each patient was questioned about dry mouth, sore mouth, bad or altered taste, difficulty talking, eating or swallowing and denture problems. The patients scored each complaint as being absent, mild, moderate or severe.

A dental examination recorded the number of teeth present, the debris index (37) and the number of decayed teeth. The denture status and denture wearing habits of each patient were recorded. Denture cleanliness was assessed as good, acceptable, poor or very poor. The frequency of oral/denture hygiene was recorded and by whom it was provided. A clinical assessment of xerostomia was carried out. The oral soft tissues were examined for the presence of erythema, mucosal plaques, atrophic glossitis, pseudomembranous candidosis,

denture stomatitis, gingivitis, denture induced hyperplasia and denture-induced ulceration.

For the reassessment visits at 3, 9 and 18 months, the same proforma was used, with the exception of the section relating to patient symptoms, which was only recorded at baseline. These reassessments were carried out blind, with no reference to the previous assessments.

Health care worker training

Care staff in group II received training immediately after the baseline oral assessment. Care staff in group I received the training immediately after the 9-month assessment.

The principal applicant (R.N.), who is a qualified dentist, conducted the training programme with the assistance of a dental hygienist. After each training session, all participants were given a certificate of attendance. A certificate was also provided to each of the care establishments in recognition that their staff had received the training. The educational intervention was based upon a resource pack entitled 'Making Sense of the Mouth' (38), containing a videotape, CD-ROM and full colour pocket book. The resource pack was provided free to each of the establishments as part of the training programme. The training sessions were undertaken for groups of six during working hours and lasted for approximately 90 min. An introductory 30-min lecture illustrating the mouth in health and disease was followed by discussion of seven protocols on basic mouth care procedures, including a sample admission sheet and care plan. Course participants were given practical demonstrations in tooth brushing and denture care and a variety of oral hygiene aids were discussed and demonstrated. In order to provide clinical demonstrations of the relevance of mouth care, local patients with common oral conditions were invited to each session to discuss their oral problems with the course participants. Furthermore, participants were encouraged to discuss the problems they themselves had encountered in providing oral care for their patients. The training session concluded with a short, amusing and informative video entitled 'Marvellous Mouths' (BBC & East Cheshire NHS Trust).

Statistical analysis

Data were double entered into a Microsoft Access[®] database and analysed using Minitab[®] (version 12). Primary analysis of categorical data was carried out using descriptive statistics and cross tabulation. To determine whether there was significant asso-

ciation between key factors, Fisher's exact test of association was used. McNemar's test was used to determine whether there was a significant change across time with regard to the selected factors, for each group separately. No inter-group analyses were undertaken in view of the difficulty of matching across the groups.

Results

Age and sex distribution

Seventy eight residents (63 female) were enrolled, with ages ranging from 35 to 99 years (median age 84 years) (Table 1). Two of the female patients in group II were younger than the other participants, but both were dependent.

Patient retention throughout the study

At the end of 18 months, 62 of the original 78 residents remained, 16 having died. The retention rates at 3, 9 and 18 months for group I were 92%, 85% and 79% respectively. The corresponding figures for group II were 95%, 87% and 79%.

Smoking history, dental status and xerostomic medication

Most of the patients were non-smokers (58%) or ex-smokers (26%). Thirty-one per cent of group I and 23% of group II retained some natural teeth. Eighty-two per cent of patients in group I and 80% of patients in group II wore dentures. In total, 51% of patients in group I and 46% of patients in group II were prescribed one or more medications capable of causing xerostomia.

Oral symptoms at baseline assessment

The majority of the elderly residents enrolled were uncomplaining (Table 2). However, dry mouth was a problem for a number of patients in both groups at baseline. There was a significant association, by Fisher's exact test, between a complaint of dry

Table 1. Age and sex distribution of the participants in the two groups

	Number	Age range (years)	Median age (years)
Group I			
Female	31	66–98	84
Male	8	65–89	82
Group II			
Female	32	35–93	86
Male	7	77–99	80

Table 2. Summary of oral symptoms disclosed by members of the study population at the baseline assessment

		Severity of complaint					
Complaint	Group	Absent	Mild	Moderate	Severe		
Dry mouth	Ι	25 (64)	9 (23)	4 (10)	1 (3)		
	II	28 (72)	3 (8)	7 (18)	1 (3)		
Sore mouth	Ι	32 (82)	1 (3)	4 (10)	2 (5)		
	II	38 (97)	0	1 (3)	0		
Bad taste	Ι	37 (95)	1 (3)	0	1 (3)		
	II	34 (87)	0	4 (10)	1 (3)		
Difficulty	Ι	36 (92)	1 (3)	0	2 (5)		
talking	II	31 (79)	1 (3)	2 (5)	5 (13)		
Difficulty	Ι	37 (95)	0	2 (5)	0		
eating	II	33 (85)	1 (3)	3 (8)	2 (5)		
Difficulty	Ι	37 (95)	0	2 (5)	0		
swallowing	II	35 (90)	0	2 (5)	2 (5)		
Difficulty	Ι	22 (69)	0	7 (22)	3 (9)		
with dentures	II	23 (74)	2 (6)	4 (13)	2 (6)		

Values are presented as n (%).

mouth and clinical evidence of xerostomia for all patients at baseline (P < 0.001). Approximately one quarter of the denture-wearing residents in each group had problems with their prostheses.

Analysis of results following training of health care workers

In the following sections of the results, the statistical comparisons reported concentrate on changes between baseline and 18 months for group II and 9 and 18 months for group I (i.e. before and after staff training for both groups). However, comparisons between baseline and 3 months are also shown for each group, since these are valuable for the interpretation of short-term, as opposed to long-term, health gain. It should be noted that whilst tables include all available data for each time point, when data were analysed using McNemar's test (i.e. when examining longitudinal changes) only

data available for both time points under consideration could be used.

Oral hygiene and gingivitis in dentate patients There were only 12 dentate residents in group I and 9 dentate patients in group II at baseline. Given the small numbers of dentate residents, no statistical comparisons across time were made in terms of oral hygiene (debris index) or gingivitis.

At baseline, 75% and 89% of dentate residents had gingivitis in groups I and II respectively. After staff training, in group II the corresponding prevalence figures at 9 and 18 months were 75% and 71%, whilst in group I after staff training (18 months) 88% of residents had gingivitis compared with 100% at 9 months.

Oral hygiene frequency

At baseline, 20% of the residents in group I and 44% of residents in group II had no daily oral hygiene procedures performed. After staff training this dropped in group II to 10% (18 months) and in group I to 0% (18 months), compared with 18% at 9 months (Table 3).

Provider of oral hygiene measures

At baseline, 82% of the residents in group I undertook their own oral hygiene, compared with 77% of group II. After staff training, there was markedly increased involvement of care staff in the provision of oral hygiene measures for the residents (Table 4).

Clinical assessment of dry mouth

At baseline, 38% of group I residents showed signs of xerostomia compared with 26% of residents in group II. A significantly greater proportion of patients who had a dry mouth were on xerogenic

		Assessment	Assessment					
Group	Frequency of oral hygiene	Baseline	3 months	9 months	18 months			
Ι	$0 \times$ Daily	8 (20)*	6 (17)*	6 (18)**	0 (0)**			
	$1 \times \text{Daily}$	26 (67)	23 (64)	14 (42)	19 (61)			
	$2 \times \text{Daily}$	5 (13)	7 (19)	13 (40)	12 (39)			
	Total no. of patients	39 (100)	36 (100)	33 (100)	31 (100)			
II	$0 \times \text{Daily}$	17 (44)***†	4 (11)***	6 (18)	3 (10)†			
	$1 \times \text{Daily}$	18 (46)	20 (54)	16 (47)	10 (32)			
	$2 \times \text{Daily}$	4 (10)	13 (35)	12 (35)	18 (58)			
	Total no. of patients	39 (100)	37 (100)	34 (100)	31 (100)			

Table 3. Oral hygiene frequency for residents at each stage of the study

Values are presented as n (%).

Italic values represent data collected after staff training was provided.

Bold values indicate statistically significant differences.

P = 1.000; P = 0.031; P < 0.001; P < 0.001.

		Assessment					
Group	Who performs oral hygiene	Baseline	3 months	9 months	18 months		
I	Resident	32 (82)*	31 (86)*	32 (97)**	10 (32)**		
	Care staff	7 (18)	5 (14)	1 (3)	21 (68)		
	Other	0	0	0	0		
	Total no. of patients	39 (100)	36 (100)	33 (100)	31 (100)		
II	Resident	30 (77)***†	15 (41)***	17 (50)	16 (52)†		
	Care staff	8 (20)	22 (59)	17 (50)	15 (48)		
	Other	1 (3)	0	0	0		
	Total no. of patients	39 (100)	37 (100)	34 (100)	31 (100)		

Table 4. Assessment of who carried out oral hygiene measures at each stage of the study

Values are presented as n (%).

Italic values represent data collected after staff training was provided.

*P = 1.000; **P < 0.001; ***P = 0.004; †P = 0.065.

medication (45%) compared with those who were not (20%) (P = 0.029 by Fisher's exact test). There was little change in the prevalence of oral dryness throughout the study in either group (group I: 39%, 30%, 29%; group II: 27%, 21%, 23%, for 3-, 9- and 18-month assessments respectively).

Mucosal disease

In group I, 87% of residents had evidence of mucosal disease at baseline compared with 79% in group II. The results are summarized in Table 5 and show a significant reduction in the number of residents suffering from mucosal disease after staff training.

Angular cheilitis

Thirty-six per cent of residents in group I and 28% of residents in group II had angular cheilitis at baseline (Table 6). After staff training, the prevalence of angular cheilitis in group II reduced significantly over the 18-month period.

Denture hygiene

The results are summarized in Table 7. For statistical analysis, denture hygiene was classified into two

categories, bad (very poor and poor) and good (acceptable and good). A significantly greater proportion of group II patients at both 3 and 18 months (i.e. post-training) had good denture hygiene compared with baseline, using McNemar's test (P = 0.006 and P < 0.001 respectively). For group I, there was no significant difference between denture hygiene at baseline and 3 months (P = 0.727), but following the training for this group at 9 months, a significantly greater proportion of patients had good denture hygiene at 18 months compared with 9 months by McNemar's test (P = 0.002).

Denture wearing habits of residents

Fewer group I patients wore dentures continuously at 18 months (37%) than at 9 months (79%) (Table 8). Although a significantly smaller proportion of group II patients at 3 months wore dentures continuously compared with baseline, this significant reduction was not maintained at 18 months.

Denture stomatitis

The data are summarized in Table 9. For the purposes of statistical analysis, denture stomatitis

Table 5. Numbers of residents suffering from oral mucosal disease at each stage of the study

Group		Assessment	Assessment					
	Mucosal Disease	Baseline	3 months	9 months	18 months			
Ι	Absent Present Tatal no. of patients	5 (13) 34 (87)* 20 (100)	2 (6) 34 (94)* 26 (100)	3 (9) 30 (91)** 22 (100)	8 (26) 23 (74)** 21 (100)			
II	Absent	8 (21)	36 (100) 16 (44)	13 (38)	51 (100) 14 (45)			
	Present Total no. of patients	31 (79)***† 39 (100)	20 (56)*** 36 (100)	21 (62) 34 (100)	17 (55)† 31 (100)			

Values are presented as n (%).

Italic values represent data collected after staff training was provided.

Bold values indicate statistically significant differences. *P = 0.375; **P = 0.131; ***P = 0.004; †P = 0.012.

Bold values indicate statistically significant differences.

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Table 6.	Numbers	of	residents	suffering	from	angular	cheilitis	throughout	the study	y
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Group		Assessment					
	Angular cheilitis	Baseline	3 months	9 months	18 months		
Ι	Absent	25 (64)*	19 (53)*	20 (61)**	22 (71)**		
	Right Side	1 (3)	0	2 (6)	6 (19)		
	Left Side	1 (3)	1 (3)	2 (6)	1 (3)		
	Bilateral	12 (30)	16 (44)	9 (27)	2 (7)		
	Total no. of patients	39 (100)	36 (100)	33 (100)	31 (100)		
II	Absent	28 (72)***†	32 (86)***	29 (85)	29 (94)†		
	Right Side	1 (3)	1 (3)	2 (6)	1 (3)		
	Left Side	2 (5)	0	3 (9)	1 (3)		
	Bilateral	8 (20)	4 (11)	0	0		
	Total no. of patients	39 (100)	37 (100)	34 (100)	31 (100)		

Values are presented as n (%).

Italic values represent data collected after staff training was provided.

Bold values indicate statistically significant differences.

*P = 0.125; **P = 0.219; ***P = 0.031; †P = 0.039.

Table 7. Denture hygiene throughout the study

		Assessment					
Group	Denture cleanliness	Baseline	3 months	9 months	18 months		
Ι	Very poor	7 (22)	6 (20)	3 (11)	0		
	Poor	14 (44)	15 (50)	11 (39)	3 (11)		
	Acceptable	9 (28)	7 (23)	12 (43)	20 (74)		
	Good	2 (6)	2 (7)	2 (7)	4 (15)		
	Total no. of patients	32 (100)	30 (100)	28 (100)	27 (100)		
II	Very poor	7 (23)	1 (3)	0	0		
	Poor	9 (29)	4 (14)	4 (16)	1 (5)		
	Acceptable	12 (38)	16 (55)	12 (48)	15 (68)		
	Good	3 (10)	8 (28)	9 (36)	6 (27)		
	Total no. of patients	31 (100)	29 (100)	25 (100)	22 (100)		

Values are presented as n (%).

Italic values represent data collected after staff training was provided.

Table 8.	Denture	wearing	habits	of	residents a	t each	stage o	f the	study

Group		Assessment					
	Denture worn continuously	Baseline	3 months	9 months	18 months		
Ι	No	12 (38)	8 (27)	6 (21)	17 (63)		
	Yes	20 (62)*	22 (73)*	22 (79)**	10 (37)**		
	Total no. of patients	32 (100)	30 (100)	28 (100)	27 (100)		
II	No	13 (42)	21 (72)	14 (56)	11 (50)		
	Yes	18 (58)***†	8 (28)***	11 (44)	11 (50)†		
	Total no. of patients	31 (100)	29 (100)	25 (100)	22 (100)		

Values are presented as n (%).

Italic values represent data collected after staff training was provided.

Bold values indicate statistically significant differences.

*P = 0.687; **P = 0.002; ***P = 0.008; †P = 0.219.

was considered as two categories, absent or present (mild, moderate or severe). A significantly smaller proportion of group II patients had denture stomatitis present at both 3 and 18 months compared with baseline.

Discussion

This study aimed to determine the effectiveness of a training programme on oral health care delivered to nursing and auxiliary staff caring for institu-

Group		Assessment					
	Severity	Baseline	3 months	9 months	18 months		
Ι	Absent	4 (13)*	3 (10)*	3 (11)**	7 (26)**		
	Mild	10 (31)	8 (27)	11 (39)	19 (70)		
	Moderate	8 (25)	13 (43)	11 (39)	1 (4)		
	Severe	10 (31)	6 (20)	3 (11)	0		
	Total no. of patients	32 (100)	30 (100)	28 (100)	27 (100)		
II	Absent	10 (32)***†	16 (55)***	13 (52)	11 (50)†		
	Mild	4 (13)	11 (38)	11 (44)	10 (45)		
	Moderate	8 (26)	1 (3.5)	1 (4)	1 (5)		
	Severe	9 (29)	1 (3.5)	0	0		
	Total no. of patients	31 (100)	29 (100)	25 (100)	22 (100)		

Table 9. Numbers of residents suffering from denture stomatitis throughout the study

Values are presented as n (%).

Italic values represent data collected after staff training was provided.

Bold values indicate statistically significant differences.

*P = 1.000; **P = 0.250; ***P = 0.016; †P = 0.039.

tionalized elderly. The outcome was measured by examining changes in the oral health of residents under their care, over a period of 18 months.

The baseline data revealed high levels of oral disease in the population studied, in line with other studies of the institutionalized elderly (2, 10–15). The study population comprised mainly frail and functionally dependent older adults of whom approximately 80% were females. Prospective matching of the two groups for age, sex and disease was not possible, as patients suffering from conditions such as stroke and dementia were located in specific establishments.

It has been reported that elderly people are relatively uncomplaining of oral problems (11). Results for the present study showed that the elderly residents were in general uncomplaining and only voiced their discomfort if symptoms were particularly severe, thus reinforcing the need for regular oral assessment and routine oral care in this vulnerable population.

Polypharmacy is a considerable problem in the elderly (39). The participants in the present study were taking a wide range of drugs. Overall, 49% of the residents were prescribed xerogenic medicines and a significant association was shown between administration of such drugs and clinically evident xerostomia. Xerostomia is an important condition in this group of patients, with the potential for increasing the risk of oral infection and dental caries, impairing denture retention, mastication and swallowing of food, and thereby resulting in poor nutritional intake.

Various studies have shown that oral care is often left to the elderly residents themselves to carry out (40), or is delegated to untrained auxiliary care staff (18–20). This occurs despite the fact that many individuals are unable to undertake their own personal care because of a physical and/or mental disability (1, 41). The baseline assessment of the residents involved in the present study supports these findings. Before the training programme was provided for the care workers, the majority (79%) of the residents were left to perform their own oral care. One-third of the residents at baseline underwent no oral hygiene procedures whatsoever. This was reflected in the high prevalence of poor dental and denture hygiene, 59% of the edentulous patients having poor or very poor denture hygiene and 81% of the dentate residents having gingivitis and plaque deposits on the teeth. Similarly, 60% of the edentulous patients reported wearing their dentures continuously.

The results after training were encouraging, showing some statistically significant changes in oral care procedures and health gains. In group I, where the staff did not receive training until after the 9-month assessment, there was no change in any of the parameters between baseline and 3 months, a valuable internal control. For group II there were significant improvements in all outcomes in the short term (3 months), although for some outcomes the significant improvement was not fully maintained in the longer term (18 months).

There was a significant increase in the number of residents whose oral hygiene procedures were performed by care-staff in group I between 9 and 18 months. The number of residents who received no oral hygiene procedures reduced significantly in both groups after training. There was a significant reduction in the numbers who wore their dentures continuously in group I after staff training, and a significant improvement in denture cleanliness in both groups.

A high proportion of the study population (83%) had oral mucosal disease at the baseline assessment. There was a statistically significant reduction in mucosal disease in group II between baseline and 18 months. In addition, several specific oral mucosal conditions were monitored throughout the course of the study. Candidal infections such as denture stomatitis, angular cheilitis and pseudomembranous candidosis have been linked to poor denture hygiene and continuous denture wearing. The fitting surface of the denture acts as a reservoir for *Candida* species in debilitated patients, therefore any improvements in denture wearing habits and denture cleanliness are important. Denture stomatitis was clinically evident in 78% of the elderly edentulous residents at baseline, but there were significant reductions in both the prevalence and severity of denture stomatitis after staff training in group II, associated with a reduction in the number of residents wearing their dentures continuously and improvements in denture hygiene.

Angular cheilitis was present in 32% of the residents at the baseline examination. The condition has been linked to the continuous wearing of upper dentures, infection by Candida and Staphylococcus species, and nutritional deficiencies including vitamin B12, folate and iron (4). The current investigation showed a reduction in the occurrence and severity of this condition following staff training, though this was only statistically significant in group II. All patients who did not respond to local measures were investigated for haematological deficiencies and diabetes mellitus and, for ethical reasons, treated appropriately. Some of the improvement noted may, therefore, be explained by these interventions, as well as the improved oral care provided by the care staff.

As shown in previous studies (32), the training in oral health care provided as part of this study was very well received. Management and senior care staff were enthusiastic to participate in the study, recognizing the possibilities for linking the training with staff personal development plans together with the potential for improving patient care, all at a minimum cost as the training was provided free of charge. High levels of staff turnover have been highlighted in previous studies as a barrier to providing training for nursing home staff (32), but this was not a significant factor in the current study, probably owing to limited job opportunities in this remote location.

Theoretical teaching alone is not sufficient when providing oral health education and there is no substitute for teaching by practical example. A training programme combined with the use of adjunctive aids to oral care has been shown to improve oral health indicators in patients (33). In the current study, each session was divided into a lecture, a practical demonstration, a case presentation and a short video. The sessions were limited to six participants to accommodate staff rotas and this also improved participation and feedback.

Of the five care establishments that participated, only one nursing home had any form of oral care record for each patient at baseline. All senior nursing staff were keen to adopt a simple oral care plan for patients and this was provided as part of the study. They were also keen to receive laminated protocols for routine oral care and a copy of the multi-media resource pack on which the training was based. This provided a long-term educational resource for each institution.

The organization and delivery of the training sessions was time consuming. In addition, there was an increase in requests for professional dental advice and treatment of the elderly residents. Whilst the benefits of providing staff training on oral health and of delivering an 'on call' dental service for care homes for the elderly are shown clearly by this study, there are major resource implications for the local dental services. If a similar training programme were to be rolled out nationally, then the resource implications would have to be given serious consideration.

In summary, a format for the delivery of a training course in oral health for care workers in elderly care has been developed and has been well received. This is one of the few studies to prove that mouth care training has had an impact on clinical practice with a measurable improvement in oral health. The procedures described could be adopted elsewhere, but due regard would have to be given to issues of resource, in particular dentist and hygienist time. There is also the need to consider the longer-term format of training programmes for care staff, with regular refresher courses being provided to ensure that improved oral health care is sustained.

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