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AUSTRALIAN INSTITUTE OF HEALTH & WELFARE

AIHW Dental Statistics and Research Unit

The Adelaide Dental Study of Nursing Homes

Research Report, October 1999

THE UNIVERSITY OF ADELAIDE

Results from the baseline data collection for the Adelaide Dental Study of Nursing Homes indicated:

- **Adelaide dentists' interest in nursing home dentistry was low;**
- **dental service provision for nursing home residents was low;**
- **dentists preferred to provide treatment for residents at their dental practices;**
- **dental professionals provided little educational assistance for nursing home staff;**
- **few dental hygienists were working in Adelaide nursing homes;**
- **specific groups of problems were associated with dental care provision in nursing homes:**
  - ◊ **the lack of portable dental equipment and environmental constraints**
  - ◊ **residents' cognitive and behavioural problems**
  - ◊ **dental practice-related issues.**

Dental inspections of residents from randomly selected nursing homes revealed:

- **a high prevalence of edentulism (66%);**
- **a high prevalence of coronal and root caries among those with natural teeth;**
- **large accumulations of plaque, calculus and food debris on teeth and dentures;**
- **a low prevalence of severe periodontal disease;**
- **high normative dental treatment needs for teeth and dentures, but lower perceived dental needs of residents and their carers;**
- **the great majority of residents were cognitively impaired and presented immense and complex challenges for carers and dental professionals;**
- **severely cognitively impaired residents had the highest levels of oral diseases, required the most assistance with oral care, and gave carers the most difficulties with oral care.**

The Adelaide Dental Study of Nursing Homes was instigated by the Australian Dental Association (ADA) (SA Branch) and the AIHW Dental Statistics and Research Unit in 1998. Baseline data were collected during 1998 and one-year follow-up data collected during 1999.

Baseline – study components

Questionnaires were mailed to all practising general Adelaide dentists (n=513) and all Adelaide nursing home Directors of Nursing (DONs) (n=114) to:

- quantify dental care provision in nursing homes;
- investigate attitudes of dentists and DONs toward nursing home dentistry; and
- identify problems with the provision of dental care.

Clinical dental inspections of 224 residents were conducted in 7 randomly selected nursing homes to:

- determine residents' dentate status;
- determine the prevalence of oral diseases;
- identify residents with the greatest amount of oral diseases; and
- compare residents' normative and perceived dental needs.

Questionnaires

Table 1: Dental care provision for Adelaide nursing homes

	% of dentists
Dentist received adequate training in clinical care of nursing home residents	***n=413***
	38.2
Provided dental care for residents of a nursing home during past 12 months (at any location)	***n=413***
	46.9
Number of nursing homes dental care provided for during past 12 months	***n=191***
1	49.7
2	22.5
3–10	25.6
11+	2.2
Hours per month spent by dentist at nursing homes providing dental treatment for residents	***n=191***
0	36.7
0.1–2.0	36.6
2.1–5.0	11.5
6.0+	5.2
Dental practice has a hygienist who provides care for nursing home residents	***n=413***
	6.1
Hours per month spent by hygienist at nursing homes providing dental treatment for residents	***n=25***
0	68.0
0.5–2.0	24.0
30	8.0

Questionnaire response rates were high for both dentists (78%) and DONs (85%). The majority of dentists were middle-aged males who had worked in private practice for 11+ years. Over 60% had not received adequate training in nursing home dentistry. Nearly 50% had provided dental care for residents of 1–2 nursing homes in the previous year. However, the quantity of care provided was small, especially at nursing homes (Table 1). Dentists preferred to treat residents at their dental practices/clinics. Only 29.5% of dentists had provided care at nursing homes, the majority of those dentists spending less than two hours per month doing so. Use of dental hygienists in nursing homes was infrequent. Less than 20% of practices assisted nursing homes with staff education about residents' oral care.

Dentists' interest in nursing home dentistry was low (Table 2). DONs' also perceived dentists' interest to be low. Dentists' and DONs' awareness of changes to dental hygienist regulations and of the ADA Nursing Home Dental Scheme were both low. The majority of dentists and DONs indicated that some form of regular dental examination by a dentist was required for dentate and edentulous residents. These responses from both dentists and DONs provide valuable information for the development of the 'Oral and Dental Care' Standard and Guidelines for residential care facilities (Commonwealth Department of Health and Family Services, 1998).

Table 2: Attitudes toward nursing home dentistry

	Dentists (%) (*n=413*)	DONs (%) (*n=97*)
Interest of dentists in providing dental care for nursing home residents		
Very/Extremely interested	16.5	12.3
Interested	26.8	28.9
Somewhat/Not interested	56.7	58.8
Were aware of change to dental hygienist regulations	39.9	24.0
Were aware of ADA nursing home dental scheme	38.7	38.1
Frequency of dental examination required for edentulous residents		
When resident admitted	7.6	3.1
At a regular interval (3–24 months)	44.3	19.6
When admitted + regular interval	38.8	37.1
As required only	6.8	28.9
Exam by dentist not needed	2.5	11.3
Frequency of dental examination required for dentate residents		
When resident admitted	3.9	4.1
At a regular interval (3–12 months)	42.9	37.1
When admitted + regular interval	48.8	50.5
As required only	4.4	7.3
Exam by dentist not needed	0.0	1.0

Dentists and DONs rated the frequency of 19 problems they encountered with the organisation and provision of dental care for residents on a 5-point Likert scale (Table 3). As dentists consistently rated problems more frequently than did DONs, scores were standardised to the group mean (dentists and DONs) to allow for a more accurate comparison.

Significant differences in standardised mean scores were evident for eight problems (Table 3). These were categorised into two groups:

- resident-related problems rated more frequently by DONs; and
- nursing home/dental practice-related problems rated more frequently by dentists.

Of the remaining 11 problems, dentists and DONs similarly rated a group of 5 nursing home/dental practice-related problems as the most frequently encountered.

Table 3: Dentists' and DONs' ratings of problems encountered with the organisation and provision of dental care for residents

	Standardised mean scores (1=always a problem; 5=never a problem)	
	Dentists	DONs
Resident-related problems rated more frequently by DONs		
Cognitive status of residents*	2.67	1.89
Behavioural problems of residents*	2.78	2.08
Financial constraints of residents*	2.76	2.29
Obtaining consent for residents' dental care*	3.52	3.19
Nursing home/dental practice-related problems rated more frequently by Dentists		
Dislike of providing regular oral hygiene care for residents by nursing home staff*	2.52	3.36
Low priority given to dental care by nursing home staff*	2.36	3.00
Increased time needed to provide dental treatment at nursing homes*	2.17	2.69
No suitable area available for dental treatment at nursing homes*	2.21	2.56
Nursing home/dental practice-related problems rated similarly by Dentists and DONs		
Nursing home staffing and time constraints	2.80	2.64
Insufficient knowledge about dental care by nursing home staff	2.44	2.63
Transportation of residents to a dental practice/clinic	2.59	2.34
Preference of dentists to treat residents at their dental practice/clinic	2.53	2.46
No portable dental equipment for use in nursing homes	2.02	2.11

*t-test $p<0.01$

The common perceptions held by dentists and DONs concerning problems related to care provision at nursing homes highlighted the key issue to be addressed in nursing home dentistry – the inability of dental professionals to provide comprehensive clinical dental care on-site at nursing homes. This resulted in the need for transportation of residents off-site to dental practices/clinics. DONs and dentists made many comments about this issue and identified several solutions, such as the hiring of portable dental equipment by dental professionals, the use of portable wheelchair headrests, and the improvement of clinical education for dental professionals in nursing home dentistry.

DONs' comments highlighted how residents' cognitive and behavioural problems often made the utilisation of

off-site dental premises a difficult, if not impossible, task for nursing home staff and residents' relatives. Dentists' inadequate awareness of and training about these resident-related problems complicated the situation even further. DONs commented frequently about dentists' lack of skills when communicating with and treating cognitively impaired, behaviourally difficult and/or resistive residents.

Many dentists commented on their lack of training and specific problems they had with nursing home dentistry:

- accessing the oral cavity of difficult residents;
- management of rampant caries;
- difficulties with denture construction; and
- physical limitations with the treatment of bed-ridden and wheelchair-bound residents.

Dentists were concerned with nursing home/dental practice-related problems and were frustrated with their perception of the low profile of dentistry in nursing homes.

Comments made by dentists highlighted their concerns:

- time spent at nursing homes and travelling between locations meant less time spent at practices;
- if dentists were not well organised and were caring for only one or a few residents per visit, there were productivity and financial ramifications;
- it was easier and more productive for dentists to treat nursing home residents at their dental practices;
- many nursing home residents did not wish to pay private dental fees so dentists charged them lower rates and classed this care as 'charitable or community work'; and
- dentists compromised themselves financially and made a loss to provide dentistry for nursing home residents.

DONs' responses provided clues to resolving dentists' frustrations with their perception of the low prioritisation of dental care in nursing homes. As commented by one DON, 'Dentists have a lack of insight and high expectations of nursing home residents and staff'. Also, residents' cognitive and behavioural problems were poorly understood by many dental professionals, but as the DONs responses indicated, these problems often dictated how residents' needs and care were prioritised in the nursing home. Staffing and time constraints also interfered with dental care. Dentists' acknowledgement, better understanding and management of these problems would assist their integration into the nursing home environment.

Suggestions to increase dentists' interest in nursing home dentistry included:

- the use of dental hygienists to implement on-going staff educational programs;
- the appointment of a dental coordinator at each nursing home;
- improved access to portable dental equipment;
- better working areas in nursing homes;
- development of clinical undergraduate experiences in nursing home dentistry; and
- postgraduation 'hands-on' clinical experience with mentors and specialty training.

Clinical dental inspections

The first 7 nursing homes randomly selected participated in the dental inspections. Participation rates varied among nursing homes, and ranged from 49% to 86%. Participants' characteristics were representative of all Adelaide nursing home residents (AIHW, 1998). The mean age of participating residents was 83.2 years. Over three-quarters of residents had cognitive testing (Mini-Mental State Exam) scores indicative of dementia, 55% of severe dementia. The majority of residents were dependent for nearly all Activities of Daily Living (ADLs). Dental inspections were completed for 224 residents. Two-thirds (66%) of these were edentulous. Edentulous residents had significant dental problems and treatment needs – they had lost a greater percentage body weight, could eat fewer foods, were more likely to have last visited the dentist for a problem, and were less likely to think they needed dental treatment. Up to 20% of residents owned dentures that were not worn. Denture-related oral mucosal conditions were prevalent, such as denture stomatitis (16.8%) and angular cheilitis (18.5%).

Dentate residents had a mean of 11.9 teeth remaining, 18.9 missing teeth, and 1.1 retained roots (0.8 decayed and 0.3 sound retained roots). They had a mean of 1.1 decayed teeth, and 3.8 filled teeth (DMFT=23.7). A mean of 0.3 teeth per resident could not be assessed because of excessive plaque/debris accumulation. Residents with a government card had significantly more missing teeth (Figure 1). Residents without a government card, those taking 8+ medications and those who could eat most foods had significantly more filled teeth (Figure 1). Males had significantly more decayed crowns (Figure 2). Males and residents who had been living at the nursing home for more than 3 years had significantly more retained roots (Figure 2). Significantly more plaque/debris covered teeth were found in residents who could eat fewer foods. Residents with severe cognitive impairment had more decayed teeth, more missing teeth, fewer filled teeth and many more plaque/debris covered teeth (not sig.).

Figure 1: Tooth status by government card status, foods eaten, and medications (n=76)

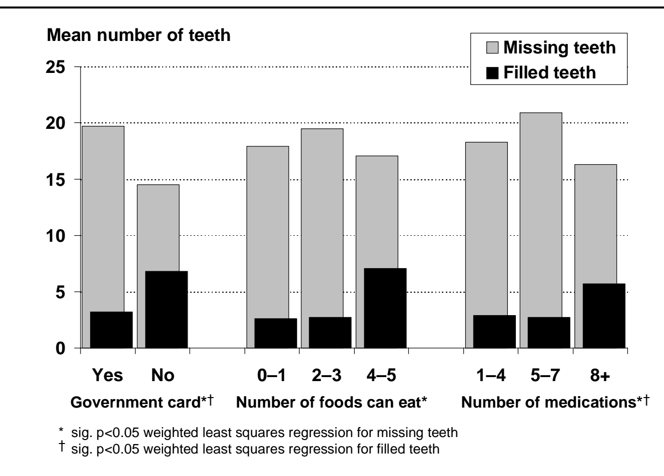
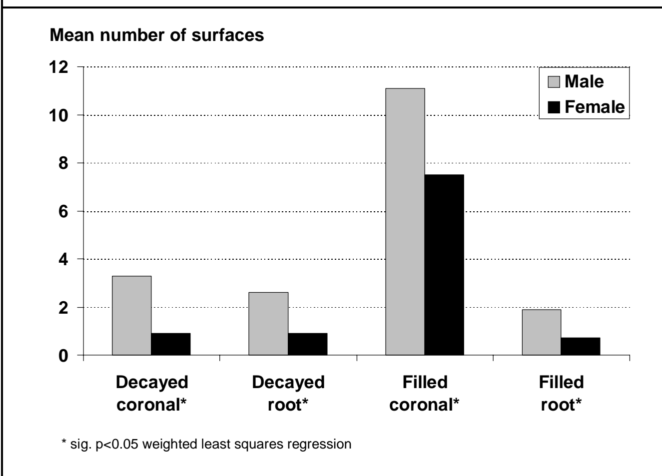
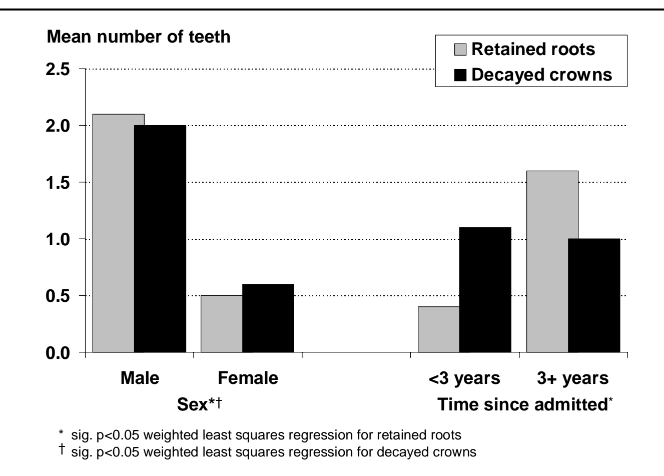


Figure 3: Coronal and root surface caries by sex (n=76)



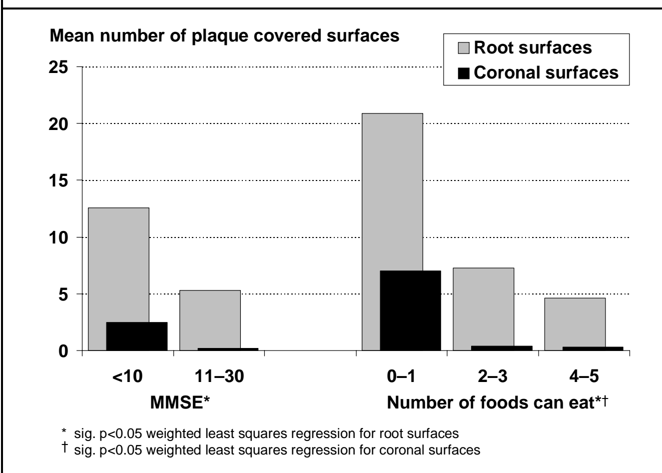
Coronal and root surface caries prevalence was high. The mean number of decayed coronal surfaces (1.7) was greater than the number of decayed teeth (1.1), indicating that multiple surfaces were affected on some teeth. Mean number of filled coronal surfaces was 8.7, decayed root surfaces was 1.5, and filled root surfaces was 1.1. Males had significantly more decayed coronal and root surfaces; they also had more filled coronal surfaces and significantly higher coronal caries attack rate (Figure 3). Males had significantly more filled root surfaces and a higher Root Caries Index (RCI) (Figure 3). Residents who could not eat many foods had more decayed coronal surfaces (not sig.), significantly fewer filled coronal and root surfaces, and a higher RCI. Cognitively impaired residents had more decayed coronal surfaces, and fewer filled coronal and root surfaces (not sig.). Caries prevalence may be underestimated as surfaces covered in plaque/debris could not be scored (mean=1.3 coronal and 8.6 root surfaces/resident). There were significantly more plaque covered surfaces in severely cognitively impaired residents (MMSE<10) and those who could not eat many foods (Figure 4).

Figure 2: Tooth status by sex and time since admitted (n=76)



Plaque and calculus accumulation was very high on residents' teeth and dentures. Over 25% of dentate and edentulous residents who wore dentures had staining/debris accumulation on more than one-third of the denture surface. Mean Plaque Index (PI) scores for dentate residents was moderately high – 1.75 out of 3 (Table 4). Residents with significantly higher PI scores were those who could not eat many foods and those who had been admitted to the nursing home more than 12 months previously. Other residents with higher PI scores were those with a diagnosed dementia and/or severe cognitive impairment, government card holders, males, younger residents, and the more functionally dependent (not sig.). Calculus accumulation was high – 63% of sites assessed for loss of periodontal attachment had calculus present on probing. Mild-moderate loss-of-attachment (LOA) was common, but severe LOA (7+mm) was evident in a small percentage (4.4%) of residents (Table 5).

Figure 4: Plaque covered coronal and root surfaces (n=76)



With increasing severity of cognitive impairment, residents required more assistance with oral hygiene care and gave carers more difficulties with the provision of this care. All severely cognitively impaired residents required assistance with the

cleaning of their teeth and dentures. The majority of carers encountered difficulties with oral hygiene care provision for residents with cognitive impairment.

Table 4: Mean Plaque Index (PI) scores – dentate residents (n=76) (unweighted)

		Mean PI Score
Time since admitted*	<12 months	1.24
	1–3 years	1.96
	3+ years	2.00
Number of foods can eat*		
	0–1	2.29
	2–3	1.67
	4–5	1.58
All residents		**1.75**

Table 5: Periodontal Loss of Attachment (n=18)

Measurement	Value
Extent of disease (% sites per resident with LOA)	
2+mm	87.6%
4+mm	46.1%
7+mm	4.4%
Severity of disease (mean LOA (mm) per resident)	3.7mm

Dentate residents had high normative treatment needs. They required a mean of 2.9 surfaces for restoration per resident. When categorised by restoration type, residents required a 1-surface restoration for a mean of 1.0 teeth, a 2-surface restoration for 0.4 teeth, and a 3-surface restoration for 0.3 teeth. Normative need for extractions was high – 0.9 teeth per dentate resident.

Residents' normatively assessed denture treatment needs were high – over 30% of dentate residents had unstable and/or unretentive upper dentures and 40% of edentulous residents had unstable and/or unretentive lower dentures. Over 20% of dentate residents had defects with their upper partial dentures. However, residents' perceived need for denture treatment was much lower than the normative need. For example, 68% of residents who needed a new full denture did not want it and 50% of residents who needed a denture reline did not want it. This low perceived need was also reflected by residents' interview responses – less than 25% of residents perceived a need for dental treatment.

Discussion

Severely cognitively impaired residents who were dependent for nearly all Activities of Daily Living:

- had less information available concerning their dental history, current dental problems and need for dental treatment;
- required the most assistance with oral care;
- gave carers more difficulties with oral care;
- had higher prevalence of coronal caries and fewer filled coronal and root surfaces; and
- had greater accumulation of plaque/debris on natural teeth and dentures.

The most frequently reported difficulties that carers encountered with residents' oral care were residents:

- not opening their mouth;
- not understanding directions about oral care;
- refusing oral care;
- kicking/hitting out during oral care;
- not being able to rinse/spit; and
- heads facing down toward their chest so that carers could not access the mouth.

Most nursing home residents in this study were very functionally dependent, medically compromised, cognitively impaired, and behaviourally difficult older adults who presented many complex challenges for their carers and dental professionals. The percentage of edentulous residents (66%) was slightly higher than national estimates for similarly aged older Australians (57%) (Carter, personal communication). This percentage was significantly lower than that reported in previous South Australian nursing home studies of 80–90% (Vowles, 1979; Walker, 1984) and parallels the current and projected edentulism estimates from national data (Carter, personal communication).

The consequences of these declining edentulism rates were evident in the study results. The prevalence of oral diseases among dentate residents was higher in this study than in previous studies:

- the mean number of teeth had increased from 8.0 in 1984 (Walker, 1984) to 11.9; and
- current nursing home residents required twice the number of coronal and root restorations than previously reported (Stockwell, 1987; Walker, 1984).

This high prevalence of oral diseases was highlighted when results were compared with data from The South Australian Dental Longitudinal Study (SADLS) of community-dwelling older adults (Slade and Spencer, 1997). Both studies used randomly selected subjects, the same study protocols, and data were weighted to provide population estimates. DMFT scores were similar in both studies:

- 23.2 for SADLS participants;
- 23.7 for nursing home residents.

However, the components of the DMFT index varied greatly. Nursing home residents had:

- 3.5 times more decayed teeth;
- 1/3 more missing teeth;
- less than half as many filled teeth;

- 5.5 times more retained roots; and
- a higher Root Caries Index.

A significant study finding was the high prevalence of dementia, especially severe dementia. The severely cognitively impaired residents were the most difficult for carers. Discussions with carers highlighted a complicating issue with oral hygiene care provision for cognitively impaired residents—the issue of restraint. What should carers do when a resident verbally and/or physically refuses oral hygiene care? When a cognitively impaired resident is excessively resistive, aggressive, abusive or threatening to carers, oral hygiene care cannot be adequately provided on a regular daily basis. It may only be possible to provide oral care infrequently and in an unpredictable manner. Even if carers have the knowledge and skills, there are some residents for whom a form of physical or sedative restraint would be required to provide oral hygiene care. Dental professionals, nursing home administrators and government officials must become more aware and understanding of these immense behavioural challenges that carers encounter. Improved preventive dental therapeutic products need to be developed to assist carers with reducing plaque accumulation and oral diseases. It is with severely cognitively impaired residents that carers require continual advice and support from dentists and dental hygienists.

Recommendations

- Dental professionals must improve their profile and provision of dental care in nursing homes.
- Improved, practical education of dental professionals is needed in nursing home dentistry and management of cognitively impaired adults.
- A more centrally coordinated and financed approach to nursing home dentistry is needed, with government assistance, to support public and private dental sectors.
- Increased availability of portable dental equipment is urgently required for both private and public dental professionals.
- The ADA (SA) Nursing Home Scheme plays an important role in facilitating private dental care for Adelaide nursing home residents and requires updating and increased .
- Increased funding is needed for the Public Dental Domiciliary Service to Adelaide nursing homes.
- Dental professionals need to work with nursing home staff and government representatives to improve the Commonwealth Dental Standard.
- Improved preventive oral care provision by carers and dental professionals is needed to address residents' high oral disease levels.
- Dentists and dental hygienists must assist nursing home staff with practical 'hands-on' oral care education, and ongoing support.

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Acknowledgements

This research was supported by the Australian Dental Association (SA Branch) and the AIHW DSRU. The research team included: Dr Jane Chalmers, Dr Chris Hodge, Dr Janet Fuss, Professor John Spencer, Ms Marilyn Jolly, Dr Rachel Mathew, Mr Knute Carter, Mrs Leonie Jeffery and Mrs Lorna Lucas. Many special thanks must be given to the nursing homes and residents who participated in this study. Their enthusiastic support was greatly appreciated.

AIHW Catalogue No. DEN 63

ISSN 1323-8744

The AIHW Dental Statistics and Research Unit (DSRU) is a collaborative unit of the Australian Institute of Health and Welfare established in 1988 at The University of Adelaide. The DSRU aims to improve the oral health of Australians through the collection, analysis and reporting of dental statistics and research on dental health status, use of dental services, provision of dental services and the dental labour force.

Published by:

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