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Measuring oral health impact among care home residents in Wales

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Objective: To explore inequalities in oral health impact among care home residents using OHIP-14 and ADHS criteria. ***Basic Research Design:*** Cross-sectional survey with structured interview and clinical examination using 2009 ADHS criteria including OHIP-14. Comparisons were made between groups of residents and with findings from the ADHS 2009. ***Participants:*** Care homes and residents were randomly selected. Those without capacity and non-English/Welsh speakers were excluded. 447 residents answered all OHIP-14 questions and had full oral examination. ***Main Outcome Measure:*** OHIP-14. ***Results:*** Reporting of OHIP problems was more common among care home residents compared with older people examined in the ADHS 2009 (50% vs 40%). There was no difference in the mean number of impacts between residents who were: dentate/edentate; denture wearing/non-denture wearing; with/without caries. Residents reporting 'problems and pain in your mouth at the moment', or 'occasional or more frequent dry mouth', more often experienced OHIP-14 impacts. ***Conclusion:*** Compared with peers living in the community, both dentate and edentate care home residents are more likely to live with one or more impacts. Two simple questions related to 'Any problems and pain in your mouth?' and 'Do you have frequent dry mouth?' may help to target care home residents more likely to experience oral health impacts.

Key words: *quality of life, dental health status, dental care for the elderly, nursing homes*

Introduction

In Western nations the population is aging (Eurostat, 2015). Historic dental trends of the older population in the UK retaining more teeth than previous generations are continuing as expected (HSCIC, 2011). Thus there are more older adults presenting with 'many teeth, many restorations, and many demands on the healthcare system' (Bell *et al*., 2015).

Care home residents are about 5% of the older adult population in the UK (Bell *et al*., 2015), but they are excluded from the Adult Dental Health Survey (ADHS) due to its method of sampling by households. Findings from the National Diet and Nutritional Survey of Older People in Great Britain in 1995 suggested a higher proportion in the care home group had difficulty eating some foods compared with those who were not living in a care setting (Sheiham *et al*., 1999). People receiving care had a higher unmet dental need, fewer teeth, and more poorly fitting dentures (Steele *et al*., 1998).

Whilst traditional clinical measures of oral disease are useful, these do not reflect the social and psychological effects of oral health problems on people's lives at a population level (Cushing *et al*., 1986). Many sociodental indicators and instruments have therefore been developed to measure the impact of oral health problems on physical and social function and wellbeing. Measures which are commonly used for this in older people are the Geriatric Oral Health Assessment Index – GOHAI (Atcheson and Dolan 1990) and the Oral Health Impact Profile (OHIP) as a 42 item (Slade and Spencer, 1994) or 14 item short form tool (Slade, 1997).

ADHS surveys use the Oral Health Impact Profile in its shortened form (OHIP-14). This instrument is used to assess the impact that oral conditions have on well-being and quality of life in seven areas: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap. The survey of care homes in Wales was undertaken to compare the burden and impact of oral disease on care home residents with findings from the ADHS, and to assess how this disease burden and impact translates into care needs (Johnson *et al*., 2014; Karki *et al*., 2015; Morgan *et al*., 2015). The recent study of oral health in care homes in Wales has therefore used OHIP-14 for this purpose. This paper focusses on findings from use of the OHIP-14 and related questions in this survey. The objective of this analysis was to explore inequalities in oral health impact experienced by care home residents using OHIP-14 and ADHS data.

Method

Ethical approval for the study was sought and obtained from the Multi-centre Research Ethics Committee for Wales (reference number 10/MRE09/4). Dentists and dental nurses from the salaried Community Dental Services (CDSs) with experience of special care dentistry were requested to participate as examiners and data recorders. They were trained in all aspects of the survey prior to

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data collection. Fifteen dentist examiners and 17 dental nurse data recorders collected clinical and/or questionnaire based data from the residents.

From the list of nursing and residential care homes, available through the Care and Social Services Inspectorate Wales website, 228 care homes were randomly selected and invited to take part in the survey. When a care home did not consent to take part in the survey another randomly selected substitute from the same Local Authority was invited to participate instead. Five randomly selected residents from each of the 205 participating care homes were invited to take part in the survey. Where there were fewer than five residents, all residents were invited to participate. Residents who could not communicate in English or Welsh were excluded from the survey. Residents who did not have capacity to consent were excluded from the questionnaire elements of the analysis reported in this paper. Residents who were able to consent were asked to consent to both questionnaire and clinical examination and these are the data analysed in this paper. Consenting participants were free to withdraw from further participation at any point in the process of data collection.

Demographic data were collected on all participating residents, but questionnaire data including OHIP-14 data were collected only from those residents assessed as having capacity to consent. Demographic data included gender, age, length of stay in home, and type of care (nursing or residential).

OHIP-14 is used to measure significant impacts on quality of life or daily living. It uses 14 questions, called items, two for each of seven conceptual domains; functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap.

Data were collected between October 2010 and June 2011, cleaned by personnel at the Welsh Oral Health Information Unit, Cardiff University and analysed using Excel 2003 and PASW statistics (SPSS, v18). Pearson Chi Square, and confidence intervals for differences in proportions were used to assess statistically significant differences between edentate and dentate residents (Newcombe, 1998). Data collection and analyses paralleled those undertaken in the ADHS 2009 to facilitate comparisons.

Results

Details of participation are summarised in Figure 1. Of the 708 care home residents with capacity, 632 consented to participate and took part in the questionnaire survey. However, dental charting was abandoned for 31 of them, leaving in a final sample of 601 residents whose mouth was fully examined. Age was recorded for all but two of the residents: range 39-102 years, mean 85.5 years (SD 8.8). Three-quarters were female (452/601, 75.2%). Demographic features of dentate (42%, 253) and edentate (58%, 348) groups were similar.

The OHIP-14 item question on "*difficulty doing usual*

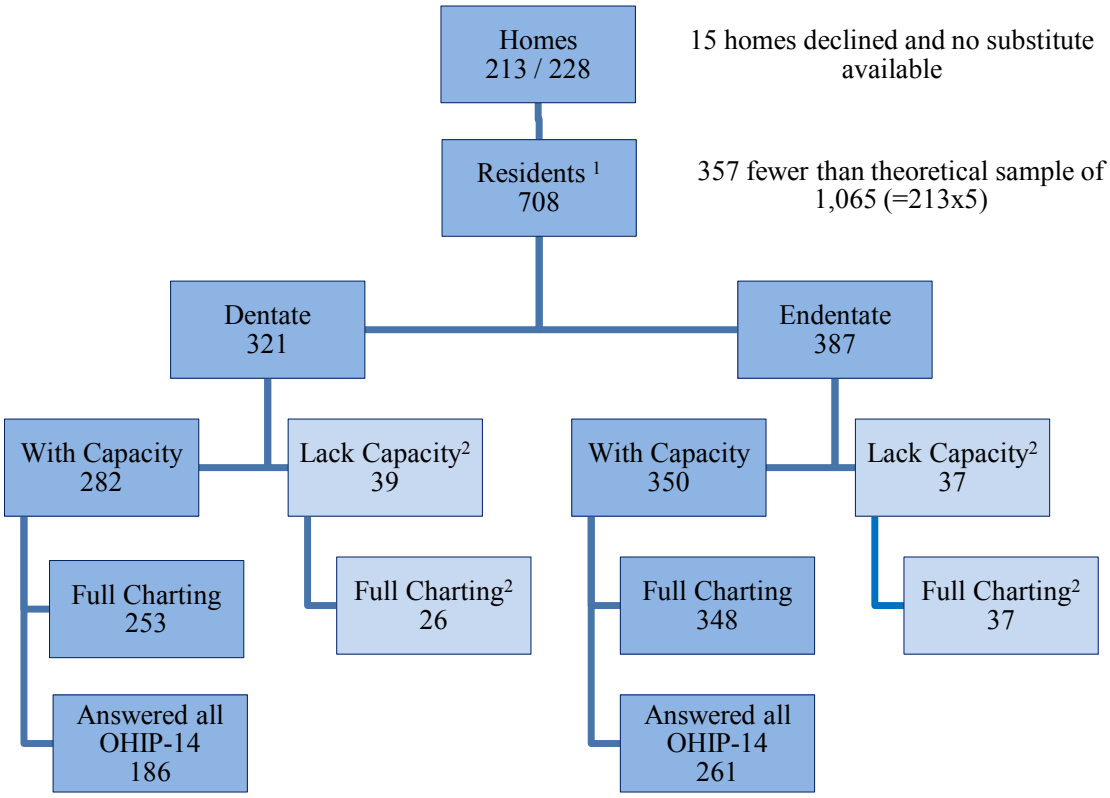

Figure 1. *Participation in the survey*

[1]Random sample of 5 residents per home with no substitution for those excluded (i.e. lacking capacity and/or unable to speak English/Welsh). Also not all homes had 5 residents.
[2]Data from residents lacking capacity were excluded from analysis

Table 1. Comparison of OHIP-14 experiences for Wales Care Home Residents 2010 and ADHS 2009

Survey	*ADHS 2009*			*Wales Care Home 2010 (n=447)*	
Cohort	*Edentate*	*All Dentate*	*Dentate 85 and over*	*Edentate (n=261)*	*Dentate (n=186)*
Having at least one problem	40%	39%	42%	50.2% (n=131)	49.5% (n=92)

jobs" was not answered by 21.6% (130/601). The range of non-response to the other 13 OHIP-14 item questions ranged from 7.5% for "*painful aching in the mouth*" to 12.0% for "*felt life in general was less satisfying*". Residents in a nursing bed were more likely to not respond to at least one OHIP-14 question.

All OHIP-14 item questions were answered by 447 participants and their data are the focus of this paper. The demographic characteristics of these residents and those who did not answer all OHIP-14 items were similar in terms of gender, mean age, proportion in nursing beds and proportion dentate. Half of the 447 complete responders reported at least one problem (49.9%, 223 residents). Details for dentate and edentate residents are presented in Table 1.

Comparison with ADHS findings demonstrates inequality of impact as measured by OHIP-14. Half of both dentate and edentate care home residents reported at least one OHIP problem. In the ADHS 2009 40% of edentate participants and 39% of all dentate adults (ranging from 34% of 75-84 to 42% of 85+ among older age groups) reported at least one OHIP problem. The mean number of problems suffered by each care home resident whether dentate, 1.3, or edentate, 1.3, was higher than that reported by the ADHS in 2009 for dentate adults of all ages, 1.2, those aged 75-84, 0.8 and those 85 and older, 1.0. Care home residents are more likely to be living with at least one oral health impact than older adults living in the community. The mean OHIP score of 4.7 for care home residents was surprisingly low compared with that for the ADHS for those aged 85 and over (17.0).

A similar proportion of dentate and edentate residents experienced at least one impact (Table 2). This was also the case for presence or absence of dentures or of caries. By contrast those residents reporting dry mouth (occasionally or more often) more frequently reported impacts. Not surprisingly those positively answering the question "Do you have any problems and pain in your mouth at the moment?" also reported one or more OHIP-14 impacts more frequently (Table 2).

Table 2. Prevalence of at least one OHIP-14 Impact by Oral Health Status

Oral health status		*n*	*With impact %*	*SE_p* [1]	*95% CI*
Dentate	yes	186	49.5	0.037	42.3, 56.6
	no	261	50.2	0.031	44.1, 56.3
Denture present	yes	331	50.5	0.027	45.1, 55.8
	no	116	48.3	0.046	39.2, 57.4
Caries present	yes	140	47.1	0.042	38.9, 55.4
	no	46	56.5	0.073	42.2, 70.8
Problems/pain	yes	42	90.5	0.045	81.6, 99.4
	no	398	45.2	0.025	40.3, 50.1
Dry mouth	yes[2]	228	61.4	0.032	55.1, 67.7
	no	218	38.1	0.033	31.6, 44.5

[1] SE_p – standard error of proportions; [2] dry mouth occasionally or more often; N.B. No answer recorded for 7 residents regarding problems/pain and 1 resident for dry mouth

The most commonly reported OHIP-14 dimension was physical pain (incorporating painful aching and/or uncomfortable to eat foods) with 31.8% stating they had suffered a problem within this dimension occasionally or more often in the previous 12 months (Table 3). Problems relating to psychological discomfort was the next commonest dimension at 21.0%. Functional limitation (20.6%), psychological disability (18.1%) and physical disability (17.9%) were all common dimensions reported as problems by care home residents. Less common were the handicap and social disability dimensions with 8.7% and 8.1% reporting problems respectively. On comparing dentate and edentate residents only one of the seven OHIP-14 dimensions had a statistically significant difference (Table 3). This was for psychological discomfort with 8% more dentate residents reporting this dimension as a problem occasionally or more often.

Table 3. OHIP-14 responses from 447 care home residents who answered all OHIP-14 questions

7 OHIP-14 dimensions	*% experiencing a problem either occasionally or more often*			
	All adults (n=447)	*Edentate (n=261)*	*Dentate (n=186)*	*Confidence Intervals difference between 2 independent proportions*
	% (n)	*% (n)*	*% (n)*	
Functional limitation	20.6 (92)	22.2 (58)	18.3 (34)	-0.038 to 0.112
Physical pain	31.8 (142)	32.6 (85)	30.6 (57)	-0.069 to 0.105
Psychological discomfort	21.0 (94)	17.6 (46)	25.8 (48)	0.005 to 0.161
Physical disability	17.9 (80)	19.2 (50)	16.1 (30)	-0.043 to 0.100
Psychological disability	18.1 (81)	17.2 (45)	19.4 (36)	-0.050 to 0.096
Social disability	8.1 (36)	8.4 (22)	7.5 (14)	-0.046 to 0.059
Handicap	8.7 (39)	8.0 (21)	9.7 (18)	-0.036 to 0.074

Discussion

The 2011 census data shows that 99% of the Welsh population aged 3 or over speak either English or Welsh proficiently (Office for National Statistics, 2011). Given the very low proportion of non-English and non-Welsh speakers it is unlikely that exclusion of residents who spoke neither language will have had significant impact on the findings of this study.

The proportion of care home residents with at least one impact is 10% higher than the proportion of older ADHS participants (50% vs 40%). Among care home residents there was very similar reporting of at least one OHIP-14 impact, occasionally or more often, across the following three two-group comparisons: dentate vs edentate; denture wearing vs non-denture wearing; and, dentate with caries vs dentate without caries

These different groups of care home residents have similar frequency of reporting at least one OHIP-14 impact. This contrasts with findings of non-UK studies that have found associations between the presence of dentures and impaired oral health quality of life (John *et al*., 2004) and studies that have found poorer global ratings of oral health amongst those with dental caries (Locker *et al*., 2001).

Presence or absence of teeth, dentures and caries are not strong predictors of prevalence of oral health impact as assessed by OHIP-14. This is consistent with other studies that have examined the relationship between self-reported experience of oral health impacts and dental disease. It is possible that OHIP-14 is not sensitive enough to detect or report upon impacts arising from disease, however, it is also possible that disease does not consistently generate oral health impacts for a range of behavioural and physiological reasons. OHIP-14 captures a wide range of uncommon behavioural and psychological impacts so the lack of sensitivity and a low OHIP score at a single point in time is not surprising (Kim and Patton, 2010).

Dry mouth, or current pain or problem questions were both better for differentiating between those care home residents with and without oral health impact using OHIP-14. This suggests OHIP-14 has sensitivity but specific oral conditions are more consistent predictors of behavioural and psychological impact. The latter two questions (pain or other problem and dry mouth) could prove useful to quickly identify individuals who might benefit from professional dental advice and care to reduce such impact.

OHIP-14 was used with both dentate and edentate residents to facilitate comparison with published ADHS findings. The ADHS 2009 survey used two quality of life measures (OHIP-14 and Oral Impacts on Daily Performance – OIDP). OHIP-14 was used in this survey of care home residents because many residents have health problems and so a single measure was used to minimise the length of time spent answering questions. In addition, OHIP-14 is the more widely used of the two tools. Given the higher prevalence of OHIP impacts among care home residents, the low mean OHIP-14 scores compared with findings for older people within the ADHS is surprising. Willumsen *et al*. (2009) recorded similarly low overall OHIP-14 scores (5.5) among care home residents in Oslo in 2007/08 and suggested that often residents "do not consider their oral health a problem". Given the other problems they are living with, oral health problems may be underplayed by care home residents. Interestingly this study also identified dry mouth as associated with impact on oral health related quality of life.

During planning of this survey, it was recognised that the question on "difficulty doing usual jobs" might be found difficult for some residents. During training examining teams were encouraged to ask residents to provide the most appropriate answer to this question from the options available. Even so this was the OHIP-14 question answered least frequently, reflecting the difficulty of interpreting this question by a care home resident.

Despite efforts to train teams to encourage residents to give a best answer to the "*...usual job...*" question, three examining teams had a smaller proportion of residents answering all 14 of the item questions. The majority of these missing answers were to the item question on "*difficulty doing usual jobs*". Most other examining teams did not have this problem. This suggests that this index can be used for care home residents provided examiners encourage answers to all 14 item questions. Reducing the number of questions for use in a care home environment may decrease the burden of time imposed on staff and residents arising from a survey, and it may be appropriate to explore the use of dry mouth and pain or other problem questions in place of OHIP-14 for some surveys or for regular dental health assessments by carers.

Conclusion

Compared with peers living in the community, both dentate and edentate care home residents are more likely to live with one or more impacts. The fact that *dry mouth* and *current pain or other problems* are strongly associated with higher OHIP-14 scores suggests that these problems are much more important predictors of oral health impact than presence or absence of teeth, dentures or caries. Two simple questions 'Any problems and pain in your mouth?' and 'Do you have frequent dry mouth?' may help to target care home residents more likely to experience oral health impacts.

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