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Opinions on the provision of dental care in Iowa nursing homes

Brian Nunez, BS¹[Transfer Admission Counselor], Jane Chalmers, BDS, MS, PhD, DABSCD^{2,†}[Associate Professor], John Warren, DDS, MS^{3,*}[Professor], Ronald L. Ettinger, BDS, MDS, DDS, DABSCD⁴[Professor], and Fang Qian, PhD⁵

¹Lewis University, Romeoville, IL

²Department of Preventive and Community Dentistry, College of Dentistry, University of Iowa, Iowa City, IA

³Department of Preventive and Community Dentistry, College of Dentistry, University of Iowa

⁴Department of Prosthodontics and Dows Institute Of Dental Research, College of Dentistry, University of Iowa

⁵Department of Preventive and Community Dentistry, College of Dentistry, University of Iowa

Abstract

Using a stratified random sample, a questionnaire was mailed to 400 practicing dentists and 200 directors of nursing (DONs). Response rates were 58.3% for dentists and 50% for DONs. Dentists were representative of Iowa dentists, with 85% male, mean age 49.1 years, and 22.4 years in practice. All DONs were female, with mean age of 44.9 years. Of the participating dentists, 86% had provided dental care for nursing home residents, but the majority of care was completed in dental offices. Three-quarters of dentists were somewhat/not interested in nursing home dentistry.

Dentists and DONs held common perceptions of the most frequent problems related to care provision at nursing homes: low financial reimbursement, especially for Medicaid patients; no portable dental equipment; no suitable area for dentistry; dentist's preference to treat patients at their dental practice; and transportation of residents to a dental practice. Dentists and DONs had some differing perceptions about oral health care ($p < 0.01$). Minimal dental care was provided on-site at Iowa nursing homes.

Keywords

nursing homes; access to care; barriers; elderly; geriatrics

Introduction

Previous cross-sectional and longitudinal research studies have documented a high prevalence and incidence of a wide variety of oral health problems occurring in nursing home residents. MacEntee *et al.*¹ attributed the high levels of oral disorders to the inadequate dental services and poor oral hygiene care available to this population. However, only a few studies^{2–8} have examined the opinions and attitudes of dentists and directors of nursing (DONs) concerning nursing home dental issues.

*Corresponding author john-warren@uiowa.edu.

†Posthumous

The first study of note was a statewide questionnaire conducted in 1984 in Colorado by Berkey *et al.*² Dentists and nursing staff had many similar but also some contradicting opinions concerning dental care and oral hygiene care issues. Among the barriers to nursing home dental care that dentists and nursing staff agreed upon were residents' financial constraints, and lack of interest in oral health care by the residents and their families. Highlighted in this study was the staffs' perception that dentists were unwilling to come to the nursing home, while the dentists' perception was that the nursing home staff and administrators were apathetic about dentistry. Dentists also identified practice-related issues as significant barriers, such as a lack of portable dental equipment and inadequate space in the nursing home. One study² highlighted communication problems between dentists and nursing homes, as the authors stated: "The need to increase appropriate dialogue and ultimately enhance the teamwork between dental care providers and nursing home personnel is readily apparent when noting the differences of perceived importance of certain barriers by response type."

In 1992, MacEntee *et al.*¹ sent questionnaires soliciting information concerning dentists' opinions about nursing home dentistry to practicing dentists in the Vancouver area and obtained a response rate of 55% (334) of the practicing dentists. The questionnaires indicated that 19% of the subjects had elected to treat long-term care residents. Valuable insight was gained concerning the lack of dental care in Vancouver nursing homes. The reasons reported for lack of dental care in nursing homes included: interference with practice and leisure activities (74%), inadequate space in the nursing homes to care for patients and lack of mobile equipment available (91%), lack of satisfaction in working in that environment (85%), and inadequate reimbursement (76%).¹ The study¹ also examined factors such as education, experience, and opinions relating to the elderly. Approximately 52% (334) of the responding dentists had previous training in geriatric dentistry as part of their undergraduate dental curriculum.¹ The curriculum was minimal and most did not include a clinical geriatric component. The absence of geriatric dentistry training was most evident among those respondents who did not attend a nursing home. Among the nursing home visits that were made, emergency tooth extractions and adjustments to dentures were the main treatments provided. In general, the dentists who chose to provide treatment to nursing home residents had a more realistic view of treatment options, outcomes, and patient tolerance than dentists who did not attend nursing homes.¹

A few studies^{9,10} have reported that the opinions and attitudes held by dentists suggest that they are not acquainted with the facts of aging and that they hold stereotypical views of older adults. However, research conducted by Ettinger *et al.*¹¹ showed that knowledge in gerontology will increase the effectiveness of the services rendered by dentists, only if their clinical confidence in providing dental care was also increased. Therefore, it is important to acknowledge that factors other than aging play a role in the reluctance of practicing dentists to attend nursing homes.¹⁰

In 2001, Chalmers *et al.*³ conducted a nursing home study in Adelaide, Australia, in which a mailed questionnaire was used to evaluate the opinions of dentists and DONs concerning dental care provision. The questionnaire was based on that used by Berkey *et al.*² in a 1988 study which included a block of 19 randomly ordered statements with a five-point Likert scale concerning dental care provision. Responses from 413 dentists and 97 DONs indicated that dentists preferred to treat nursing home patients at their dental offices rather than nursing homes. Dentists and DONs held several common but many varying perceptions of the problems associated with dental issues in nursing homes. Both identified a group of nursing home environmental constraints and a lack of portable dental equipment as a barrier. DONs identified a group of resident-related problems while dentists acknowledged a group of dental practice-related problems. This study highlighted that more research was needed to

investigate the specific issues of dental care provision versus oral hygiene care provision in other samples of dentists and DONs.³

Pyle *et al.*⁴ surveyed the executive directors of Ohio long-term care facilities concerning their values about oral health and influences on dental care delivery. A 33.2% response rate reported a difference in the perceived poor oral health of residents and the high level of satisfaction with dental care services. Pyle⁴ concluded that the poor response rate together with the study findings highlighted the low priority level of oral health care in nursing homes, and the executive directors' "distance" from the true oral health needs of their residents.

In a 2006 study, Berkey *et al.*⁵ again investigated the oral healthcare perceptions in United States nursing homes by mailing questionnaires to a random sample of DONs in nine representative regions in the U.S. (N=1,333). The response rate was 50% (n=664). The results revealed that DONs and social workers were most likely to coordinate dental care; nearly 30% of facilities did not have a written plan of care for oral health; 8% had on-site dental equipment; nearly half of residents were reported to be examined annually by dental professionals; 28% were likely to receive dental care beyond an examination, and 25% of these visits were related to dental emergencies.⁵ In addition, only 15% of the respondents were dissatisfied with their facilities' capacity to address dental emergencies.⁵ Barriers to oral health care with the highest mean level of significance were dentists' willingness to treat residents, and financial concerns of the resident/family.⁵ A logistic regression model was constructed to assess key variables; statistically significant factors ($p<0.05$) in decreasing strength of association were: availability of dental equipment, having a written dental care plan, and having a dental care plan coordinated by the unit charge nurse. The study revealed a variety of state-based differences; for instance, when compared to facilities in New York, residents in Arizona and Texas faced much greater barriers due to financial constraints, transportation of residents for care, and willingness of dentists to treat at nursing facilities. The findings of Berkey *et al.*⁵ confirmed that there are substantial barriers to care which appear to vary considerably by region in the U.S.

Decision-makers in Michigan nursing homes and alternative long-term care settings were questioned about perceived barriers to accessing oral health care.⁶ The most significant barriers perceived by administrators of nursing homes were the lack of willingness of dentists to provide dental care at nursing homes, difficulties transporting residents to dental offices, and the financial concerns of residents.⁶

There has been relatively little published regarding the opinions of dentists and directors of nursing in Iowa. However, in 1996–97, all 428 directors of nursing in Iowa were sent a questionnaire asking a series of questions about the Minimum Data Set (MDS) and its uses to identify oral health issues of the residents.⁷ In this study, the nursing directors reported that about half of their residents received no care. Although the DONs stated that the MDS was useful in identifying oral problems, it clearly was not being used as it had been designed. Also, unless the nursing home assessors look in the mouth and force the nursing homes to use the oral/nutritional section of the MDS as it was intended under OBRA regulations, no change will occur.

Rossow *et al.*⁸ reported on findings from a questionnaire mailed to all practicing dentists in Iowa to investigate dentists' involvement in the care of patients in nursing homes and factors involved in this care provision. A 53% response rate was achieved. Dentists were mainly male (86%), with a mean age of 47 years. One-third were nursing home dentists of record. Almost 90% had seen one or more nursing home patients in their dental office in the preceding year. However, only 38% had seen residents at the nursing home. Dentists who

were older and from smaller communities, who had access to portable dental equipment, and who were dentist of record for a nursing home were most likely to have provided dental care for residents at a nursing home. Others who provided care at nursing homes were those with didactic and clinical training in geriatric dentistry and who had completed advanced general dental training.⁷

In 2004, the Iowa Dental Association (IDA) and faculty from the University of Iowa College of Dentistry initiated an IDA-coordinated program to try to link dentists with local nursing homes. Thus, the study we are reporting here aimed to investigate the opinions of dentists and directors of nursing in Iowa concerning nursing home dental issues, and their knowledge of the existence of the IDA program and other influences on dental care provision in nursing homes.

Methods

The study sample was drawn from a stratified random statewide sample (by county) of 400 practicing dentists and 200 DONs. Dentists and DONs were selected from all 99 counties in Iowa. Moreover, the dentists were selected from a list of all practicing Iowa dentists and DONs were selected from a state published list of Iowa nursing homes. Subjects were asked to complete a questionnaire regarding their opinions toward nursing home dentistry. The dentists and DONs each received a similar questionnaire. The questionnaire was developed from those used by Berkey *et al.*² and Chalmers *et al.*³

The questionnaire was composed of five yes-or-no questions, five objective questions, and 20 questions in which we asked the DONs and dentists to rank how often they encountered a particular situation, with a five-part Likert scale response. In addition, space was provided to invite comments or concerns regarding the organization and provision of dental care for nursing home residents. A postage-paid envelope was provided for return of the questionnaires to the University of Iowa. After three weeks, a second mailing was sent to non-respondents. A thank-you letter was sent out to all respondents who completed and returned the questionnaire. Confidentiality was maintained using a four-digit identification number on all questionnaires. No individual participants or nursing homes were identified in any project reports/publications. Approval for the study was obtained from the University of Iowa Institutional Review Board. Descriptive statistics were used to profile the respondents, and a chi-square test or *t*-test was used to investigate the responses from DONs and dentists. Skewness of the dataset concerning dentists' age and care provision pattern negated further multivariate analysis.

Descriptive analyses involving the survey responses were conducted. Bivariate analyses using a chi-square test were conducted to assess the difference in responses between dentists and DONs regarding their perceptions of problems encountered with the organization and provision of dental care for nursing home residents in Iowa. Subsequently, variables that demonstrated statistically significant association in the bivariate analysis ($p \leq 0.10$) were used to develop a final logistic regression model using forward stepwise logistic regression analysis, and were verified using backward elimination. All possible two-way interactions were considered for all variables in the final model.

All tests utilized a 0.05 level of statistical significance. SAS for Windows (v9.1, SAS Institute Inc., Cary, N.C., USA) was used for the data analysis.

Results

The response rate was 62% for dentists (249/400 dentists) and 55% for DONs (110/200 DONs) after the initial and follow-up mailing. All responding DONs were female, with a

mean age of 44.9 years. The results from the DONs were as follows: 59.8% (64/107) could get “quality dental services” for dentate residents and 40.2% could not; 64.5% (69/107) could get quality dental services for their edentulous residents and 35.5% could not. In addition, 44.5% (49/110) had some dental treatment provided on-site at their nursing home and 92.7% (102/110) had dental treatment for their residents at a dental office. It was found that 43.6% of nursing homes had assistance educating staff members about dental care for residents. Only 7.3% of DONs were aware of the IDA program which pairs dentists with local nursing homes, and only 2% had participated in it. Approximately 77% of DONs thought that dentists were “only somewhat or not interested” in providing care. The main person to coordinate dental care in the nursing home was the DON (76%), often in combination with another staff member such as a senior nurse or social worker.

It was found that 85% of dentists were male and 95% were in private practice. The dentists' average age was 49.1 years and they had an average of 22.4 years in practice. Over three-quarters of dentists said they had provided care for residents in the past 12 months, but that could have been at their dental office or at the nursing home. The results from the dentists were as follows: 76.7% provided care for nursing home residents with a mean of 2.6 nursing homes served and for a mean of 1.3 hours per month; 36.6% (70/191) provided some care at nursing homes, with the great majority of the care provided at dental offices.

Bivariate results revealed that older dentists were more likely to provide dental care on-site at nursing homes. The mean age of these dentists was 52.0 years for those who provided on-site care, and 47.7 years for those who did not (t -test, $p < 0.01$). The mean time the dentists were in practice was 25 years for those who provided on-site care, and 20.9 years for those who did not (t -test, $p < 0.01$).

There was no statistically significant difference in the mean number of nursing homes served between dentists who provided care on-site at the nursing home vs. only in their offices (t -test, $p > 0.05$). Those dentists who provided on-site nursing home dentistry spent more hours treating nursing home residents (mean=3.13 hours per month for dentists providing on-site care in the nursing home and 0.2 hours for those who did not). Only 24% of dentists were aware of the IDA nursing home program and only 4% were participating in it. Dentists who had participated in the IDA nursing home program provided more on-site nursing home dentistry (chi-square, $p < 0.01$), although those merely aware of the IDA program were not more likely to provide on-site care. Those dentists who assisted nursing homes with staff education provided more on-site nursing home dentistry (chi-square, $p < 0.01$). Furthermore, 72.5% (179/247) were “not interested or only somewhat interested” in providing dental care for nursing homes. Those dentists who were more interested in providing dental care for nursing homes provided more actual dental care on-site at nursing homes (chi-square test, $p < 0.01$).

Table 1 presents the bivariate analyses comparing dentists' and DONs' responses to the list of problems in treating nursing home residents. The most frequent problems reported by both groups were: lack of portable dental equipment, dentists' preference to treat residents at their dental office, low financial reimbursement for dentists, and financial constraints of residents. Both dentists and DONs had similar views concerning the following described problems: dentists' disinterest in nursing home dentistry, financial constraints of residents, residents' cognitive status and behavior problems, dentists' preference to treat residents at their dental office, transportation to dental office, insufficient training for dentists, and low financial reimbursement for dentists. Dentists clearly perceived a group of problems related to the dental practice ($p < 0.05$): increased time needed to provide dental treatment at nursing homes, lack of portable dental equipment, and no area for providing dental treatment. Dentists also perceived that nursing homes gave dental care a low priority, which was in

contrast to the DONs' perception ($p < 0.01$). Dentists also perceived more than DONs ($p < 0.01$) that families and residents were not interested in dental care, that nursing home staff had a lack of knowledge about dental care, that nursing home staff and time constraints were problematic, and that residents' medical problems and obtaining consent for treatment were problematic.

Table 2 displays results of the final logistic regression model which explores the association of responses from both groups and variables related to the perceptions of problems encountered with the organization and provision of dental care for nursing home residents in Iowa, using forward stepwise logistic regression analyses. The results indicate that dentists were more likely to always or frequently report problems with nursing home staffing and time constraints, nursing home staff's lack of knowledge about dental care, dental treatment as a low priority for staff, and families being uninterested in dental care. Dentists were 4.31 times as likely as DONs to occasionally, seldom or never report that insufficient training of dentists was a problem.

No significant interactions were found in the final model. Collinearity diagnostics were also examined with variance inflation factor (VIF) and eigenvalue analysis. Both tests revealed that no linear relationship existed between each independent variable and others in the model.

Discussion

Providing dental care to the geriatric community will continue to be important because these populations are increasing in number and are retaining their natural teeth longer. To accommodate and provide dental care for the increasing numbers of dentate older Americans, many dental schools have implemented changes in their curricula to prepare and educate dental students. In a 2003 study, Mohammad *et al.*¹² reported that U.S. dental schools in 1976 did not require any geriatric course work, although 5% provided a specific course in this discipline. In contrast, the 2003 study found that 98% of dental schools require didactic coursework as part of the pre-doctoral curriculum and approximately 33% operated a geriatric clinic within the dental school. The majority of U.S. dental schools have increased their geriatric curricula, but the geriatric clinical component has not kept pace with the rapid growth of the aging population.

Our study found that 85% of the Iowa dentists surveyed were male and their average age was 49.1 years with an average of 22.4 years in practice. These results are similar to those reported by Rossow *et al.*⁸ This is significant because many in this group of dentists reported that they did not receive the intensive clinical and didactic experience in geriatric dentistry that is currently in place at The University of Iowa. Those few who did provide dental care on-site at nursing homes seemed to be either the oldest dentists or the youngest dentists. In an earlier study, Ettinger *et al.*¹¹ reported that dental students who had been exposed to geriatric clinical experiences were more likely to provide dental care to residents of long-term care facilities after graduation. That study surveyed graduates of the University of Iowa College of Dentistry from 1975 to 1985 to examine the influence of the comprehensive geriatric dental curriculum on dental practice. The changes in the geriatric clinical curriculum were implemented in 1980. The study found that dentists who graduated before 1980 were more likely to be providing treatment such as examination, emergency care, and/or denture care. However, dentists who graduated after 1980 and who had experienced the geriatric clinical experience with dependent elderly adults were more likely to carry out comprehensive dental care in nursing homes.¹¹ Although statistically significant differences were reported, the actual number of dentists involved in this study was very small. It is unlikely that the provision of comprehensive dental care in nursing homes will

change until future cohorts of younger dentists with clinical training in geriatric dentistry replace the older cohort of Iowa dentists.⁷ Further longitudinal investigation of the program is needed to evaluate if the implementation of the geriatrics course at the Iowa College of Dentistry has affected the geriatric practice habits of our graduates.

The provision of on-site dental care in Iowa nursing homes reported in this study was low and concurred with the previous study of Iowa dentists by Rossow *et al.*⁸ When dentists provided care for nursing home residents, they preferred to do so in their dental offices rather than at the nursing homes. Chalmers *et al.*³ also found the majority of dentists practicing in Adelaide, Australia, preferred to treat patients at their dental offices. Those studies also reported that DONs could not access adequate comprehensive dental services for residents, and that transporting residents to dental offices was very problematic for the nursing home. The results of the Adelaide study and others^{2,3,5-8} revealed that similar factors may contribute to the issue of why dental care provision in nursing homes is low.

Another interesting finding from the current study was the low level of knowledge about and participation in the IDA nursing home program instituted in 2004. This program had been presented at the annual state meeting and at several sites around the state since its inception. An evaluation of the results of this study suggests that there is a need to improve communication between dentists and nursing homes and that the IDA-supported program has had little influence on the general dental community or services to nursing homes.

MacEntee and colleagues^{13,14} have offered some insights into nursing home dental care. Qualitative research in Canadian nursing homes revealed that the key to successful dental care provision was the presence of a “dental champion” to coordinate and advocate for dental issues in the nursing home. To ensure successful dental care provision, MacEntee^{13,14} highlighted the need to utilize a Geriatric Oral Health Triad in nursing homes: 1) regular oral assessment, 2) oral hygiene care, and 3) dental treatment. Further integration of these Triad components is needed in Iowa nursing homes.

The cognitive, medical, and behavioral conditions of residents were also a frequent concern among both dentists and DONs. In this study, Iowa dentists were more aware of the resident-related problems than reported in other similar studies. Chalmers *et al.*¹⁵ reported on the importance of implementing a “hands-on approach” or demonstration by a caregiver, when providing an educational intervention with nursing home staff for residents with cognitive and behavioral problems. Dental hygienists clearly must play an important role in the delivery of adequate “hands-on” training and educational support to nursing home staff. U.S. regulations concerning hygienists’ ability to practice independently or under general supervision in nursing homes varies greatly between states, and this is an issue that will become increasingly topical in the coming years.

Legislation has addressed some of the dental care provision concerns in the U.S. However, the success of this legislation has been questioned by many involved in nursing home dentistry and more change is needed to ensure that adequate emergency and comprehensive dental care is accessible to residents.^{15,16} The Omnibus Reconciliation Act (OBRA) of 1987 mandated that each nursing home have a dentist affiliated with the nursing care facility, and that each resident have a dentist of record. However, several studies^{7,16} have indicated that the Minimum Data Set (MDS) dental assessments used as part of the OBRA mandate identify very few oral health problems, and that even when problems have been identified they did not translate into dental utilization. In Iowa, the findings from the study of the use of the MDS⁷ indicated that dentists were only providing care to a small percentage of residents off-site in the nursing home and most of this care was focused on emergencies, extractions, and denture treatment and was not comprehensive dental care. The study⁷

provided an insight to the perceptions of DONs and dentists regarding nursing home dental care. One of the dentists' most notable concerns was the financial burden of providing dental care to this population. The time constraints of traveling to nursing homes meant less "chair time" in their private practice, and poor compensation due to reduced fees, especially for the many residents on Medicaid. Jablonski *et al.*¹⁷ found that elders in long-term care facilities have limited financial resources and options when paying for dental care.

Jablonski¹⁷ attributed these limited options to the lack of dental care coverage by Medicare coupled with the low reimbursements of Medicaid; this was a great area of concern in comments made by our study subjects as well. Other factors that were note-worthy in the current Iowa study included the issues of no area to provide treatment, lack of portable dental equipment, and residents' and families' lack of interest. Interestingly, there were several differences in opinion between DONs and dentists in this study that help us to gain insight into the communication issues among dental professionals and nursing homes. For example, the results of this study suggest DONs and dentists feel differently about the priority of dental care in Iowa nursing homes. The DONs felt that dental treatment was seldom or never a low priority for residents while the majority of dentists felt that dental care was frequently or always a low priority. Pyle *et al.* (2005)⁴ attributed this discontinuity to the disconnection of executive directors of nursing homes from the oral care of their residents, and their lack of knowledge concerning the importance of oral healthcare and its systemic implications. Further investigation is needed to understand this disconnection between dentists and nursing homes.

The limitations of this study were related to time constraints. The study timeline did not allow for more than one follow-up mailing, which could have increased the response rate. This study highlighted that more investigation is needed concerning the actual number of patients receiving dental care on-site in nursing homes versus at private practices. Also, as has been found in recent observational nursing home research with Certified Nursing Assistants, the levels of care provision related to the mouth may have been overestimated by nursing home staff.¹⁷ Thus, future studies in this area need to qualitatively and quantitatively investigate the three components of MacEntee's^{13,14} Geriatric Oral Health Triad (oral health assessment, oral hygiene care, and dental treatment), and the extent to which each is being addressed in Iowa nursing homes; only then can best-practice oral health interventions be successfully trialed.

Conclusion

There was little provision of dental care for residents on-site in Iowa nursing homes. The great majority of the older Iowa dentists were somewhat/not interested in providing dental care for nursing homes, and three-quarters of the DONs also perceived this to be the case. Directors of nursing and dentists agreed in their perceptions that problematic factors included financial constraints of residents, residents' cognitive status and behavior problems, dentists' preference to treat residents at their dental office, transportation to the dental office, insufficient training of dentists, and low financial reimbursement for dentists. Dentists perceived a group of dental practice-related problems, including increased time needed to provide dental treatment at nursing homes, lack of portable dental equipment, and no area for providing dental treatment. Dentists also perceived that nursing homes gave dental care low priority, which was in contrast to the DONs' perception. Dentists also perceived more than DONs that families and residents were not interested in dental care, that nursing home staff had a lack of knowledge about dental care, that nursing home staff and time constraints were problematic, and that residents' medical problems and obtaining consent for treatment were problematic.

The reason for dental care neglect in nursing homes has been partially defined, but the nursing home environment is a complex one. Therefore, only further research on these topics will allow the dental community to gain insight into the barriers that prevent the older population from utilizing dental care. Such information is instrumental to the implementation of policy, strategies, and dental curriculum, if one is to improve the oral health of residents in nursing homes.

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Table 1
Comparison of director of nursing and dentist responses to frequency of problems in treating nursing home residents

Question	Directors of Nursing (%) n=110	Dentists (%)n=249	p-value*
Disinterested dentists			
Always or frequently	55.0	63.2	0.151
Occasionally, seldom or never	45.0	36.8	
Financial constraints of resident			
Always or frequently	46.8	50.6	0.506
Occasionally, seldom or never	53.2	49.4	
Staff and time constraints			
Always or frequently	23.9	61.6	<0.001
Occasionally, seldom or never	76.1	38.4	
Dentists' preference to treat patients in their offices			
Always or frequently	67.9	58.9	0.110
Occasionally, seldom or never	32.1	41.1	
Obtaining consent for treatment			
Always or frequently	5.5	19.0	0.001
Occasionally, seldom or never	94.5	81.0	
Increased time involved in treatment			
Always or frequently	25.0	68.0	<0.001
Occasionally, seldom or never	75.0	32.0	
Behavior problems of residents			
Always or frequently	27.5	36.2	0.113
Occasionally, seldom or never	72.5	63.8	
Nursing home staff's lack of knowledge about dental care			
Always or frequently	12.8	68.5	<0.001
Occasionally, seldom or never	87.2	31.5	
Transportation to dental office			
Always or frequently	47.7	50.6	0.613
Occasionally, seldom or never	52.3	49.4	
No portable dental equipment available			
Always or frequently	70.6	82.3	0.015
Occasionally, seldom or never	29.4	17.7	
Dental treatment a low priority for staff			
Always or frequently	21.1	82.3	<0.001
Occasionally, seldom or never	78.9	17.7	
Cognitive status of residents			
Always or frequently	38.5	45.0	0.259
Occasionally, seldom or never	61.5	55.0	

Question	Directors of Nursing (%) n=110	Dentists (%)n=249	p-value*
No area for providing treatment			
Always or frequently	41.7	66.7	<0.001
Occasionally, seldom or never	58.3	33.3	
Families uninterested in dental care			
Always or frequently	11.9	40.5	<0.001
Occasionally, seldom or never	88.1	59.5	
Medical conditions of residents			
Always or frequently	28.4	47.0	0.005
Occasionally, seldom or never	71.6	53.0	
Insufficient training of dentists			
Always or frequently	31.8	22.5	0.069
Occasionally, seldom or never	68.2	77.5	
Low reimbursement for dentists			
Always or frequently	56.5	61.5	0.382
Occasionally, seldom or never	43.5	38.5	
Residents' lack of interest			
Always or frequently	26.9	53.2	<0.001
Occasionally, seldom or never	73.1	46.7	

*
p-values based on chi-square analyses

Table 2
Logistic regression model for responses from dentists and DONs (final model, giving odds ratio adjusted for other variables in the model)

Variable	Odds Ratio 95%CI	p-value
Staff and time constraints		<0.0001
Always or frequently	5.99 (3.05-11.78)	
Occasionally, seldom, or never	1.00	
Nursing home staff's lack of knowledge about dental care		<0.0001
Always or frequently	5.18 (2.33-11.49)	
Occasionally, seldom, or never	1.00	
Dental treatment as a low priority for staff		<0.0001
Always or frequently	5.72 (2.77-11.82)	
Occasionally, seldom, or never	1.00	
Families being uninterested in dental care		0.0404
Always or frequently	2.37 (1.04-5.42)	
Occasionally, seldom, or never	1.00	
Insufficient training of dentists		0.0002
Occasionally, seldom, or never	4.31(2.02-9.16)	
Always or frequently	1.00	

* Hosmer and Lemeshow Goodness-of-Fit Test (p=0.6046)