Dental auscultation for nursing personnel as a model of oral health care education: development, baseline, and 6-month follow-up assessments

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Oral health care has been shown to have low priority in nursing and has been only partly successful. To create more positive effects than those achieved through traditional oral health care education, this project tested an educational model for nursing staff personnel. In addition to traditional oral health care education, some of the nursing staff members passed an additional dental auscultation period and served as oral care aides. The aides were responsible for the oral health care of the residents at their nursing facilities (intervention group). The intervention nursing facilities were compared with facilities where nursing personnel only received a traditional oral health care education program. Assessments were made at baseline and at a 6-month follow-up. At follow-up it was shown that the nursing staff in the intervention group gave higher priority to the oral health care work than the nursing staff in the control group. ☐ *Education; elderly; nursing; oral health care*

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The improved dental health observed in most industrialized countries (1) is not apparent among many elderly and long-term care patients (2). Among individuals who receive different forms of caring and nursing, previous oral care routines are often interrupted due to conflicting priorities, and oral care risks are neglected (3). Such interruptions may negatively influence the oral health of these individuals. If the medical health care system lacks efficient routines for oral health care, serious hidden and growing oral problems could occur, problems that could prove very difficult to solve.

In a previous interview study among nursing personnel it was found that oral health treatment was given low priority. This finding was related both to circumstances like insufficient knowledge, routines, and support and increased workload, and to the staff's personal feelings towards the performance of oral health care (4). Registered nurses have been shown to have more positive oral health care attitudes than other nursing staff groups. Recent evidence suggests, however, that registered nurses are not much involved in the practical performance of oral health care (5).

To improve the unsatisfactory oral health care among the increasing number of dependent elderly and long-term care patients, regular activities to increase knowledge and change the attitudes among nursing staff personnel have been suggested (6). In addition, regular dental check-ups among these patient groups should be given higher status. Finally, there is a need to establish relevant documentation systems for oral health care in nursing facilities (7).

Thus, a superior oral health care practice in nursing is suggested. Information should be tailored to meet the perceived needs, the context, and the influence of role models (8). A Swedish study showed that a 4-h education program specifically directed to a nursing staff was successful in focusing the staff's knowledge about the healthy mouth instead of the diseased mouth. A further finding in this study was that a nursing staff with lower education favored an education in practical procedures, whereas a higher-educated staff was more disposed to a theoretically oriented education (9).

In 1999 a new dental insurance system was introduced in Sweden. This system offers dependent individuals free oral health controls at specified institutions or in their homes and any necessary dental treatment, according to the medical health care system. The system also offers oral health care education to nursing staff and support from dental teams (10). After 4 years the effects of this system will be evaluated, and the planning of future oral health care for elderly and dependent individuals will be initiated on the basis of the results of the evaluation.

During the first part of this period the present intervention study was performed in Sweden. A traditional oral health care program was compared with a system that provides additional support from specially trained oral care aides recruited from the nursing staff personnel. The aim of this study was to compare whether this type of oral support system was more conducive to creating positive lasting effects relative to a traditional educational model as assessed by means of the attitudes of nursing staff personnel.

Materials and methods

Study population

The study population consisted of nursing staff members and their residents. The intervention and control groups were chosen on the criteria that they were administered by the same ward director, who consented to participation, and that they were comparable with regard to type of residents and nursing facility. The intervention group was made up of two units at a nursing home, with 24 beds in each unit. One unit had mostly demented elderly, whereas the other largely focused on stroke patients. The control group was from another nursing facility in the same district with 36 beds and a closely situated apartment complex for 12 demented elderly. The participating personnel were selected on the basis that they had permanent employment and daytime schedules. The ward director chose two oral care aides—one nursing assistant and one nursing aide—from each of the two intervention units. The aides worked on different shifts and thus did not have much contact with one another during working hours. The oral care aides and staff representatives of the intervention and control groups were subsequently organized into three focus groups. In the present study only the data from the staff-related assessments are reported; the residents' data will be reported elsewhere.

Study design and procedures

The local ethics committee gave approval for this study in 1998. Primarily, the study model was tested with one pilot oral care aide. This aide attended the work at a dental clinic for 1 day, and after 1 week was interviewed by two of the present authors (I. Wårdh and S. Sörensen). The aide's experiences and views of her auscultation day were used to help guide the final study design.

The investigation was conducted as an experimental study with one intervention and one control group. Both groups received traditional oral health care education, but the intervention group was given supplemental support from specially trained oral care aides recruited from the nursing staff personnel.

After presenting detailed information about the project, written informed consent was obtained from both residents and staff. All staff members who worked permanently on daytime schedules were willing to participate in the study. The oral health care education was offered to all nursing staff in small groups of 10 persons or less. The education consisted of 2 h of theoretical and 1 h of practical education in oral health care and was held at both the intervention and control units. The theoretical part consisted of a lesson with slides concerning oral health care facts. The practical part focused on different types of tooth replacements, oral health care tools, and how to perform oral health care on residents with varying oral status and dependence. The nursing staff also had the opportunity to practice on each other. All activities involving the educational program were carried out by a dental hygienist.

Supplemental to the educational program, the oral care aides of the intervention group attended the dental clinic for observation and auscultation training 1 day per week over a 4-week period. The aides were given the opportunity to follow the work of both the dentist and dental hygienist at different treatment sessions and during home visits to patients. The intention of this procedure was to familiarize the oral care aides with oral health care routines and to give them a deeper understanding of different dental treatments. The aides also assisted during various dental treatments while under close supervision. Discussions were included about how the general status of the patients influenced both the choice and the performance of the different oral treatments.

After the auscultation period the oral care aides returned to their nursing units with a written description from the dental staff of their new working duties. However, instructions on the structure of their work locally was not specified but rather left to be resolved at each nursing facility. The oral care aides had the possibility to contact the dental clinic for support. Table 1 presents an outline of the function of the oral care aides. The opportunity to contact the dental clinic was also given to the control units, although without any routines for these contacts.

Three focus groups were selected in accordance with the suggestions of Morgan (11). One group consisted of the four oral care aides; a second group comprised four personnel from the intervention group; and three personnel from the control group made up the third group. Groups two and three were selected to be representative of the intervention and control wards, respectively, in terms of nursing experiences.

Instruments

The Dental Coping Beliefs Scale (DCBS) (12, 13) was used. It consists of four dimensions: Internal Locus of Control, External Locus of Control, Self-Efficacy, and Oral Health Beliefs. In this study the DCBS was slightly modified for use in a context in which oral health issues for residents are of primary concern. In its original version the DCBS was used to measure cognitive changes after personal oral hygiene interventions. Twenty-four items were translated into Swedish and retranslated to English by

Table 1. Outline of the oral care aides' function

Oral care aides should:
1. Primarily deal with problems concerning oral health care, including questions from the relatives of the residents.
2. In agreement with the nurse, determine whether an oral health care problem should be referred to the dental clinic.
3. If necessary, contact the dental clinic.
4. Inform the other nursing staff members about oral health care issues and ensure that exhaustive documentation is performed.
5. Inform all residents, and especially new ones, about the dental insurance system.
6. Assist whenever follow-up assessments are made of any oral health care interventions.

Table 2. The distribution of different nursing staff groups

Nursing staff groups	Intervention, $n = 31$	Control, $n = 32$	Total, $n = 63$
Registered nurses	4	4	8
Assistant nurses	18*	20	38
Nursing aides	8	7	15
No answer	1	1	2

* All staff members were female, except for one.

a bilingual university translator. The staff members rated each item on a five-point scale, where 1 signifies high positive beliefs and 5 denotes low negative beliefs. The questionnaire also included two open-ended questions: 'How would you describe the present oral health care work at your ward?' and 'If you were able to chose, how would you like the oral health care work at your ward to be structured?'.

The focus group interviews were held at the nursing facilities. They lasted about 90 min and were tape-recorded and written verbatim by a trained secretary. The interviews were open, and no guidelines were used. The principal author (I. Wård) acted as coordinator in an effort to encourage the group members to speak freely—that is, to carry on everyday, normal conversation about oral health care. Focus was maintained on how the nursing staff had experienced the oral health care work after the educational sessions and the introduction of the oral care aides in the intervention group (11).

Data collection

Before the start of the oral health care education in both intervention and control group and the auscultation training of the oral care aides in the intervention group, baseline data were collected using the DCBS index together with the two open-ended questions. After 4 months qualitative interviews were held in the three focus groups. Six months after the baseline assessments follow-up data were collected. The nursing staff was asked once again to fill in the DCBS index and the two open-ended questions.

Analysis

We used confidence intervals for differences between medians. Because the data collection procedure was completely anonymous, individual differences could not be analyzed. Even though almost all staff was the same, we considered them separate groups at baseline and follow-up. Statistically significant differences were assumed at 95% confidence interval.

The qualitative analysis of the written data and the interviews in focus groups was done using content analysis (14) in three steps. The first step was an open coding, by which concepts were identified and developed. Similar concepts were labeled and grouped to form categories. In the second step connections were made between a category and its subcategories. Finally, a more integrated understanding of events, processes, and interactions was sought (14).

Results

Quantitative assessments

At the start of data collection 31 individuals in the intervention group (mean age, 38.5 years; standard deviation (s), 10.3 years) and 32 individuals in the control group (mean age, 39.3 years; s, 9.7 years) agreed to participate. Individuals in the intervention and control group had been in nursing care, on average, for 13.7 and 16.7 years, respectively. Of the 63 participants 1 was male (in the intervention group) and 62 were female. The distribution of different nursing staff groups is given in Table 2.

Table 3 depicts the medians of the four dimensions of the DCBS scale. As indicated in Table 3, the intervention and control groups were similar, but there was an overall tendency for somewhat more positive Internal Locus of Control beliefs as compared with the other three dimensions.

In the intervention group 31 individuals again participated at the follow-up assessment. In the control group 15 of the original 32 individuals participated. The mean age of these 15 participants was 43.4 years, which is significantly higher than the mean age of the intervention group, even though they did not have more experience at nursing care. The distributions of the different nursing staff groups at follow-up were the same as at baseline.

There was a tendency for lower DCBS scale values in the intervention group at follow-up, except for Internal Locus of Control. In the control group the values tended to increase, except for Oral Health Beliefs (Table 3).

Table 3. Pre- and post-intervention differences between medians for the Dental Coping Beliefs Scale in intervention and control groups

Nursing staff groups	Preintervention, $n = 31$	Postintervention, $n = 31$	Control before, $n = 32$	Control after, $n = 15$
Internal locus of control	1.33 (1.17–1.67)*	1.33 (1.17–1.50)	1.33 (1.17–1.67)	1.50 (1.17–1.83)
External locus of control	1.83 (1.50–2.00)	1.50 (1.17–2.00)	1.50 (1.33–2.00)	1.67 (1.33–2.83)
Self-efficacy	1.83 (1.50–2.00)	1.50 (1.33–2.17)	1.67 (1.50–2.00)	2.00 (1.67–2.33)
Oral health beliefs	1.83 (1.50–2.00)	1.50 (1.17–1.83)	1.67 (1.33–2.00)	1.50 (1.00–3.33)

* 95% confidence interval.

Qualitative analysis

Baseline. At baseline all participants responded to the open-ended questions. At the 6-month follow-up nine respondents in the intervention group did not answer the open-ended questions. The oral care aides had been told that some personnel were satisfied with the oral health care and not able to add any additional information besides the DCBS.

The analysis of the two open-ended questions showed at baseline that the present oral health care situation was seen as unsatisfactory by both intervention and control facilities. When the staff expressed their view on future oral health care work, it could be categorized in oral health care needs of Establishment and Access (Fig. 1).

Establishment. The staff expressed a need for a more established role for oral health care in nursing through 'improved knowledge, 'better routines', 'increased support,' and providing 'more time for oral care'.

'We could form an oral health care group to keep us informed about oral care news and to receive more education or guidance from the dental team.'

'We should have follow-up controls with light and mirror after the oral care work. Now you work mostly after what you believe is right.'

'We need help from a dental hygienist on a regular basis in order to provide sound advice and for oral check ups.'

'I wish we had more time for oral care so that small brushes, toothpicks and dental floss could be regularly used.'

Access. The respondents identified violation of personal integrity as an obstacle in performing oral health care. They did not want to use any form of abuse in the oral health care situation.

'I wish we didn't have to nag about the oral care but do it when it's convenient.'

'I wish we could make the residents understand that oral health care is important and that they shouldn't be afraid or aggressive when we perform oral care.'

The problems identified in the two above categories—establishment and access—resulted in the respondents expressing a strong desire for a better attitude towards oral health in nursing care.

'I wish that all staff could be more aware of oral health care work for the elderly. Many colleagues don't seem to bother when patients protest that they don't want to take out their dentures in the evening.'

There were also personnel who did not express any oral health care needs: 'I can't imagine that we can do the oral work in another way than we already do.'

Follow-up. At the 6-month follow-up there was still a need for oral health care improvement in the control group. Many of the participants in the intervention group expressed satisfaction with improved oral health care and wished to maintain this improvement. Those who did not express satisfaction did express confidence in future oral health care work: 'I think we have a good system. It works well as it is now. But it would be a good thing to fresh up the memory in short meetings now and then.'

'I think that what's going on is good. All staff receives the same information through the oral health care cards.

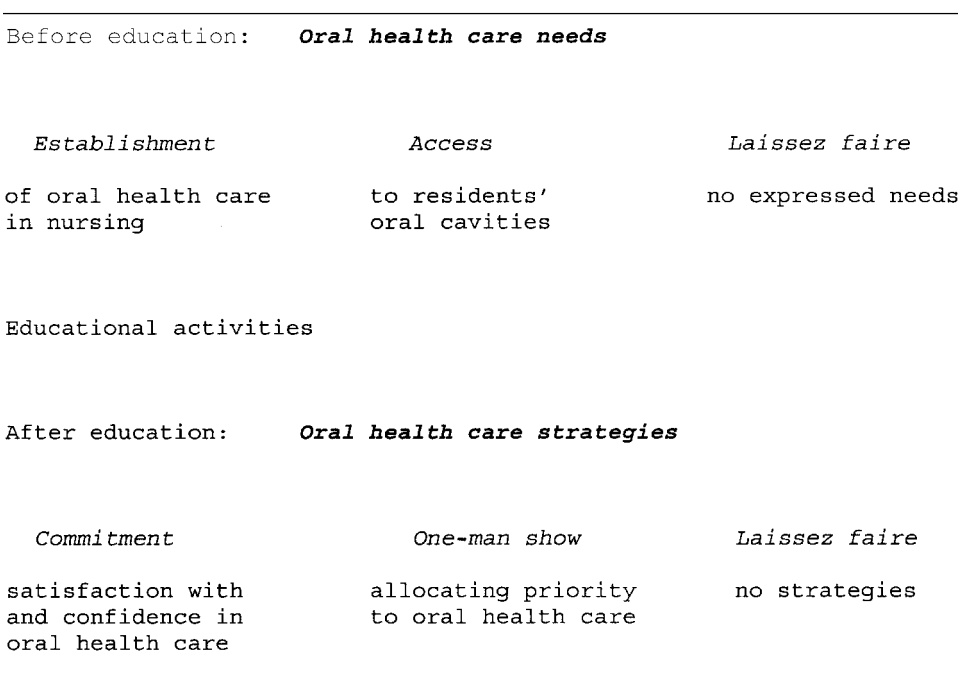

Fig. 1. A model of oral health care needs and strategies to meet these needs during influence of oral health care education, as expressed by the nursing staff.

Because it is well planned, it will work once everyone has learned the routines.'

Focus group interviews

The analysis of the three focus groups interviews resulted in three possible strategies for the dispersion of oral health care information among the staff to meet the oral health care needs. The intervention group gave strong 'Commitment' to oral health care. In the control group the staff acted mainly in accordance with a 'Laissez-faire' and 'One-man show' attitude.

Commitment. When both the nurses and the other staff members supported the oral care aides, they could immediately commence with the oral health care work. One of the intervention wards conducted itself in such a way, as illustrated below by the staff's comments.

'We put up information signs about the new oral care aides on the information board and also informed everyone at a meeting. When new residents are coming, we immediately tell them about our oral health care work. We ask about their oral status and report to other staff members. We are the first contact and then we take the information to the nurse' (Intervention group).

The nursing staff formed narrow circles around the residents' oral health care.

'Each staff member has three of his or her own residents and three that he or she shares with a colleague. This is because elderly with dementia ought to have stable circumstances' (Intervention group).

Sometimes it was difficult to handle a resident. It was declared that demented could be easier for the staff to handle than non-demented elderly and that they then acted as the residents' advocates: 'For some patients it is difficult to discuss matters involving oral care! It's easier to perform oral hygiene work with a dementia patient, even if it may differ from one day to another. Here some relatives come directly to us with issues concerning oral care. There are many wives asking about their husband's teeth' (Intervention group).

In general, the staff was positive to the new oral health care system: 'It's very good having oral care aides that maintain oral contacts and create better routines' (Intervention group).

Laissez faire. Some of the nursing staff did not react to the changes taking place in oral health care. This problem was commonly indicated in the control group but was also an initial problem in one of the intervention wards, where the oral care aides expressed considerable difficulty in carrying out their work: 'The other staff members don't care about our new function and therefore consult with the nurse as usual. I don't think they really are aware of our function as oral care aides. The pathways of information are not so clear' (Intervention group).

There was a problem in that the staff nursing around the residents could vary substantially: 'Three residents share two contact personnel who are primarily responsible for their care, but this system doesn't make any sense in the daily nursing work, only when going to the hairdresser and the doctor or such . . .' (Intervention group).

Residents with stroke were more likely to express their own needs and wishes, but they sometimes showed little interest in oral health care: 'They want to decide themselves about their teeth. They are depressed and sometimes struck with fear after a stroke; at such times these patients don't think about their teeth. It's hard not to believe a patient when they say they have already brushed their teeth. The relatives of the stroke victims are also sad and depressed and therefore matters of oral health care are of little importance' (Both intervention and control group).

The new oral health care system did not seem to have influenced the routines much: 'The information paper about the oral care aides got lost somewhere. I don't think there has been so much to change' (Intervention group).

'We have those who brush their own teeth. I think they can continue doing so without us disturbing them' (Control group).

One-man show. The oral health care education was offered to all the staff members as they had wished: 'I think it's good that we have all been offered this education. I feel more ready now to think in other ways concerning oral matters' (Control group).

Unfortunately, not all members attended the oral health care sessions. The non-attenders were night and vacancy staff and probably acted in accordance with the usual practice.

'Oral health care education is usually given to only one or two persons, who are then expected to share their newly acquired knowledge with the others; this procedure, however, doesn't always work in practice' (Control group).

The motivated staff expressed many difficulties in sharing oral health care responsibilities with other staff members: 'It's important to have clear routines rather than doing what you individually believe is right, which is the way it is now. If you have to be critical or pass on information, it's easier to do so at a meeting or in a group situation than on a person-to-person basis. It is not uncommon that you carefully brush a patient's teeth and immediately afterwards another staff member comes with sweets!' (Control group).

Discussion

There are serious doubts about the effectiveness of traditional dental in-services. Fiske & Lloyd (15) identified three principal reasons that hinder the provision of good oral health care: practical issues, information and training, and psychological barriers. Our previous studies in Swedish settings have shown a similar pattern of circumstances concerning oral health care work (4, 5). The present study was a first step in comparing a new model of oral health care education with a traditional oral health care education system.

When education in oral health care is offered to nursing staff members, it is not certain whether they will attend the

educational sessions (16). There are several explanations to account for this phenomenon, such as an overwhelming workload or a low priority for this type of education/information. There is also a need for practical training in addition to the theoretical education that is offered (16). When the oral health care message was discussed in the three focus groups, communication was noted to play a major role. The dental team that provides the education cannot always expect that specific information will be correctly passed on to all the persons in need of it. In our study we gave the ward director the authorization to choose the oral care aides. It was assumed that the director sought to select individuals who were serious and could run the project effectively until it was officially terminated. The ward director had managed both the intervention and the control group nursing facilities for several years, was well known among staff members, and was familiar with the dental team responsible for the project. Another study highlighted the power of informal opinion leaders and suggested that these leaders should be identified and targeted with information for further dissemination of information to the other nursing personnel (8).

Although the term oral care aide has been used in the past, there is no definition of the expression (17). In Sweden oral care aides have been used to receive oral health care education as a target group among non-oral health care-educated nursing staff (18). The oral care aides in this study acted as a complement to the other staff personnel, taking responsibility for the oral health care work.

We used both qualitative and quantitative methods in this study. Both paradigms have weaknesses that, to a certain extent, are compensated for by their reciprocal strength (19). Because of anonymity we could not compare individuals and one should be careful when interpreting the results from group level to individual level.

For quantitative assessment a scale to measure Dental Coping Beliefs (DCBS) was adapted for use among the staff members in this study. It would be valuable to repeat the modified DCBS in further nursing studies to ensure that it is reliable in this context. In its original version the DCBS was used to measure cognitive changes after personal oral hygiene interventions. In that study participants in the experimental conditions, compared with untreated controls, showed an increased belief in their individual ability to control dental disease, Internal locus of control (13). In the present study the intervention group tended to show increased beliefs at follow-up except for Internal Locus of Control. The control group tended to show decreased beliefs at follow-up except for Oral Health Beliefs.

A possible explanation for these changes may be that the nursing staff initially had high expectations for oral health care education and thus gave high baseline values to DCBS but were nevertheless disappointed with the education in some respects. This feeling of dissatisfaction was compensated for in the intervention group but not in the control group.

The qualitative data were assessed by open written questions and in-depth interviews in focus groups, which gave several opportunities to study the oral health care phenomenon and look for similarities and inequalities in the material. The results showed three possible strategies when meeting oral health care needs, due to the influence of the oral health care education. All strategies were represented in both intervention and control groups, but there was a change in the intervention group towards feelings of confidence in the ability of meeting these needs or satisfaction about the actual situation. The staff in the control group continued to express needs about a higher priority for oral health care work.

These results would probably not have been discerned if the study had terminated after a shorter time than was presently the case. One of the intervention groups had problems when initiating the oral care aides system. The group failed to support the oral care aides in their effort to work effectively. The head nurse detected the problem, as indicated by the fact that the problem had been resolved at the 6-month follow-up. The reasons for this initial problem can be explained by the 'Laissez-faire' strategy, in which the staff continued taking the oral health care problems to the nurse rather than to the oral care aides, as was intended.

As observed by other researchers, there is a host of difficulties when dealing with the unique environment of nursing facilities (8). The intervention group was kept intact, whereas a significant dropout rate was noted in the control group at the 6-month follow-up, especially among younger staff personnel. We could not further analyze the dropouts, but when we asked the staff about the lack of cooperation, they referred to the fact that participation was free. This result may be a mere coincidence, but it may also reflect the above-mentioned disappointment with traditional oral health care education. According to the 'One-man show' strategy in the focus groups' interviews, it appeared difficult for the more motivated staff members to influence other members when no established routines existed. When the study was first initiated, we had informed staff, residents, and relatives of the residents about the nature of the project and that it would be running for 1.5 years. Regrettably, in the control group several confounding factors were in evidence. For instance, the demented elderly residents had to move from one residence to another, and the local director of the nursing home was forced to take a long-term leave of absence from work because of illness. The intervention group also experienced changes in staff and residents but, according to the 'Commitment' strategy, was still successful in keeping the oral health care project running smoothly.

Research in dental health education and health promotion often has short postintervention follow-up periods. Such short times inhibit obtaining accurate knowledge about the effects of the intervention (20). Paulsson et al. (9) concluded that traditional oral health care education still positively influenced the nursing staff after 3 years but also that the health care educational level of the staff influenced the result. The needs and working condition of nursing staff members in an ever-changing environment are context-

dependent (21). Thus, a well-functioning oral health care education system must follow these changes. Our conclusion is that dental auscultation as a model of oral health care education of oral care aides seemed to better meet the oral health care needs of nursing staff in nursing homes than only traditional education.

Further follow-up assessments will be conducted after 18 months, to reevaluate this project.

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