Impact of an oral hygiene education initiative on the practice of oral care by unregulated care providers guided by registered nurses

Joyce A. Bruan-Wimmer, DipDH; **Patricia Ruiz-Skol**, MN, GNC(C)

ABSTRACT

Observation: Research has demonstrated that oral care provided by nursing staff is often "inadequate or non existent", and points to the need for training in specific oral care strategies. This study explored the impact of an oral hygiene education program for unregulated care providers, and examined the nurses' perception of their role in directing the oral care practices of the unregulated care providers. **Methods:** An intervention study was performed by a dental hygienist and a nurse educator on the neuromuscular unit of the hospital. It was implemented by using pre- and post questionnaires, education sessions and evaluations. An oral care audit was completed by the Toronto Public Health Dental Unit. **Discussion:** It was determined that nurses had a strong belief in looking after their own oral health and that of their patients, yet some nurses were unsure of their accountability. Some of the unregulated care providers demonstrated that they were not comfortable with providing certain aspects of mouth care and providing mouth care to patients who had behavioural issues. Role clarification in oral care practice for both groups was addressed during the sessions. They felt that the knowledge learned gave them confidence. **Conclusion:** The study demonstrated that there was a change in the approach to oral care practices of the nurses and the unregulated care providers. They worked as a team to provide proper mouth care to their compromised patients.

RÉSUMÉ

Introduction : La recherche a démontré que des interventions dentaires agressives réduisaient l'occurrence de la maladie et, en conséquence, de la morbidité dans les servi ces de soins. Néanmoins, la littérature démontre que la prestation des soins buccodentaires par le personnel soignant est souvent « inadéquate ou inexistante », et pointe le besoin de formation dans des stratégies spécifiques de soins buccodentaires. Cette étude a porté sur l'impact d'un programme de formation en hygiène buccodentaire pour les dispensatrices de soins et examiné la perception qu'ont les infirmières de leur rôle de direction des pratiques non réglementées chez les dispensatrices de soins buccodentaires. **Méthodes :** Une étude d'intervention a été effectuée par une hygiéniste dentaire et une infirmière monitrice dans l'unité neuromusculaire de l'hôpital. Elle comprenait des questionnaires avant et après l'intervention, des séances de formation et des évaluations. Une vérification des soins buccodentaires a été menée par l'Unité de santé buccodentaire publique de Toronto. **Discussion :** L'on a établi que les infirmières croyaient fermement aux soins qu'elles prenaient de leur propre santé buccodentaire et celle de leurs patients, mais certaines d'entre elles n'étaient pas assurées de leur responsabilité. Certaines dispensatrices de soins non réglementées ont démontré qu'elles n'étaient pas à l'aise de dispenser certains aspects des soins de la bouche et d'administrer ces soins à des patients qui avaient des problèmes de comportement. Les sessions ont porté sur la classification des rôles des infirmières et des dispensatrices non réglementées dans la pratique des soins buccodentaires. Celles-ci estiment que l'apprentissage des connaissances pertinentes leur donnait confiance. **Conclusion :** L'étude a démontré un changement dans la façon des infirmières d'aborder les soins buccodentaires et la prestation de soins non réglementée. Celles-ci travaillaient en équipe pour procurer des soins buccodentaires appropriés à leurs patients compromis.

Key words: oral care, oral hygiene education, nursing personnel, unregulated care providers

INTRODUCTION

Oral care in long term care settings is often neglected. Researchers have demonstrated that good oral care can yield important health benefits to improve long term care quality of life.[1] Yet, studies have shown that oral care is poorly provided.[2,3]

The literature shows that unregulated care providers, who receive little formal training in mouth care, deliver most of the daily oral care in long term care facilities.[4–6] Therefore, it has been suggested that training and having continued oral health education interventions may be effective means of promoting improved oral care in long term care facilities.[7] Dr. J.A. Gil-Montoya[8] pointed out, "Establishing an oral hygiene protocol for the frail and functionally dependent elderly should be of special concern to health care providers…this type of protocol should include regular collaboration with dental professionals and provide a program of continuous training for nursing staff on oral health issues." The specific purpose of this project was to determine whether an education program for unregulated care providers, under the guidance of the registered nurses, was effective in leading to improved oral health and knowledge base of oral care for the participants.

THIS IS A PEER REVIEWED ARTICLE. Submitted 30 May 2012. Last revised 17 Sept. 2012. Accepted 19 Sept. 2012.

Bridgepoint Hospital, Toronto, Canada
Correspondence to: Joyce Bruan-Wimmer; jwimmer@bridgepointhealth.ca

A variety of factors, such as fiscal restraints, technological advances, and shorter hospital stays, have increased the use of unregulated care providers.[9] Consequently, the role of the registered nurse has expanded to include teaching, delegating, assigning and supervising unregulated health care providers.[9] Registered nurses are accountable for their actions within these domains of nursing practice when utilizing unregulated health care providers. While the College of Nurses of Ontario specifies practice guidelines for registered nurses to work with unregulated care providers, the beliefs and perceptions of staff nurses—related to the impact of directing care routines such as oral care for patients—need further examination.

METHODS

The project, led by a dental hygienist and a nurse educator, had the following research questions:

1. What is the impact of an oral hygiene education initiative on the practice of oral care by unregulated care providers (known as personal service providers at Bridgepoint Hospital)?
2. What is the perception of the registered nurses regarding their role in directing this practice by unregulated care providers?

An intervention study was performed to evaluate the effect of the education in terms of changes in practice. The study was conducted at Bridgepoint Hospital, which provides complex care and rehabilitation to individuals living with chronic disease and disability. The hospital's neuromuscular unit (post stroke, multiple sclerosis, amyotrophic lateral sclerosis [Lou Gherig's disease], Huntington's disease, Dandy Walker syndrome) was chosen because of the health complexity of the patients whose duration of stay in the hospital had been more than five years and whose need of assistance from the staff was higher. The staff's shifts of work and number of staff in each shift differed:

- the day shift had four registered nurses and nine unregulated care providers;
- the evening shift had four registered nurses and four unregulated care providers, and
- the night shift had two registered nurses and two unregulated care providers.

The unit was divided into four modules. Each module had twelve patients. During the study, there were approximately forty-five to forty-eight patients. The number fluctuated when patients were discharged to an acute care hospital or when they were on a visit/stay with family and/or friends for a day or weekend. An oral hygiene education initiative was implemented using the following:

- *Pre questionnaires* — These questionnaires (see Supplementary Information) were distributed to the participants prior to the first session. The questionnaires were developed by the dental hygienist and nurse educator to establish knowledge, attitude and behaviours of the staff towards oral care and oral health.
- *Three education sessions* — Each session included a Powerpoint presentation (created by the dental hygienist) and time for discussion. The nurse educator gave additional information on the role of the registered nurses in oral care and on strategies working with patients who had behavioural issues. One session focused on the importance of oral health and the provision of oral care to our compromised patients. Another focused on the normal and abnormal oral conditions found in our patients' mouths. The last session offered oral care techniques and strategies when working with patients with behavioural issues. During this session, the staff had an opportunity to demonstrate the learned skills on each other. The information presented at each session was tailored specifically for the patient population on the neuromuscular unit. The duration of the sessions was also considered due to the time constraints experienced by the staff during their shifts.
- *Post questionnaires* — These were administered after all the education sessions were delivered to compare with the pre questionnaire results.
- *Evaluations* — These evaluations (see Supplementary Information) were completed by the study participants after each session. These were used to determine if the sessions were appropriate and whether they had met the participants' expectations. This was an opportunity to obtain qualitative data.

The purpose of the study was communicated at staff meetings and through recruitment letters and flyers. At first, the staff's perceptions of the study were negative. They felt that there was too much time investment on their part, and also felt that this was an opportunity for a job performance evaluation. These issues were clarified through discussions with the staff during meetings. Therefore, their perceptions changed. All nursing staff on the unit had the opportunity to participate in the study; if staff did not want to voluntarily participate, they could attend the education sessions if they wished.

Initially, eight unregulated care providers and five registered nurses were recruited for this study; however, four of them withdrew due to conflicts with schedules. Five unregulated care providers and four registered nurses participated in this study. These participants worked the day shift; later in the study, some of them rotated to work the evening shift and therefore, some sessions were offered during the evening. Although the sample size was small, it was an example of research in practice and the small sample size was a reflection of the nature of the practice environment. When the study participants were involved in the education sessions, the other staff provided care to the patients with higher needs. We found that the speech-language pathologist, nurse clinician, manager, physiotherapist, occupational therapist and pharmacist of the unit would attend some of the sessions. It was emphasized by the staff that most of the direct personal care, such as showering, oral hygiene of the patients, was provided by the unregulated care providers.

During the study, the dental hygienist and nurse educator were visible in the unit and were available if the staff had had questions or concerns about some of the learned strategies implemented at the bedside. The

Toronto Public Health Dental team—a dental hygieinist and a dental assistant—was asked to assess the unit one month after the last education session.

Data analyses of the project included answers from questionnaires to ascertain knowledge, beliefs, and judgement about oral care, feedback from participants on the education initiatives, and results of the oral care audit—generated by Statistical Package for the Social Sciences (SPSS), the computer program used for statistical analysis. A flow chart of the education initiative is shown in Figure 1.

Figure 1. Flow chart of the education initiative.

Ethical considerations

A research ethics board application was submitted to and approved by the Joint Bridgepoint-West Park Research Ethics Board. Ethical considerations were met by gaining informed consent, ensuring the dignity, confidentiality and prevention of harm to the participants, and by giving assurance that their participation did not have any negative impact on their job responsibilities or their colleagues. A numerical coding to identify each participant was used on the data collection forms. Data were stored in computerized files and as hard copies. All files were kept in a locked cabinet in the principal investigator's office. All data were then destroyed upon completion of data analyses. The benefits of this study were the enhancement of the knowledge base of oral care for the participants and the reduction of the occurrence of illnesses such as acquired pneumonia and other lung infections for our patients. There were no known risks associated with this study. All participants voluntarily participated in the study and were informed of all aspects of the study and were asked to sign a consent form.

FINDINGS

Tables 1 and 2 show the results of the pre- and post questionnaires for the registered nurses and unregulated care providers. In both the tables, only those questions answered incorrectly or those that depicted a certain belief or perception were highlighted. The tables show that there was an improvement for both groups.

Table 1 shows that in the "True and False" section, there was only one question in the pre questionnaire that the nurses had answered incorrectly. They all felt that oxygen therapy, suctioning, mouth breathing and NPO status ("nil per os" meaning "nothing by mouth") did not affect the oral mucosa of older adults. The pre questionnaire also revealed the following:

- half of the nurses did not realize that they were accountable for their own and that of the unregulated care providers oral care practices;
- all the nurses knew that it was important to report

Table 1. Results of the registered nurses questionnaire.

	Results	Pre questionnaires	Post questionnaires
Q. 6	Questions 1 to 9 (True and False section) Effects of medical treatments on oral status (Oxygen therapy, suctioning, etc.)	All nurses had this answer incorrect – all were unaware that the medical treatments would affect the oral status	All scored perfectly – awareness of the medical treatments increased
Q. 10	**Accountability** of their own and that of the UCPs oral care practices	50% knew	All knew
Q. 11	Who to report changes in oral status to	All answered correctly – Physician	Same response
Q. 12	Obtaining oral care products on unit/hospital	All nurses were unfamiliar	All nurses were very familiar
Q. 13	Their own belief of seeing the dentist	They all had the same belief that it is important to see the dentist regularly	Same response

Table 2. Results of the unregulated care providers responses.

	Results	Pre questionnaire	Post questionnaire
Q. 2 Q. 5 Q. 6 Q. 9	Questions 1 to 9 (True and False section) Effect of dry mouth Massaging and cleaning of gums Toothbrush maintenance Food can get trapped in the cheek folds	• 100% answered this incorrectly • 50% answered this incorrectly • 100% answered this incorrectly • 80% answered this incorrectly	All were answered correctly
Q. 10	Obtaining oral care products on unit/in hospital	All were unfamiliar on how to obtain the oral care products	All participants were familiar
Q. 11	Who to report changes in oral status to	All answered correctly - RN in charge	Same response
Q. 12	Barriers to providing mouth care to patients	• 80% indicated that the patients' behavioural issue was the main barrier while • 20% experienced no challenges	The same 80% - No longer experienced barriers
Q. 13	Years of providing mouth care	• 50% provided mouth care for 1 to 5 years • 50% - 6 to 10 years	Same response
Q. 14	Mouth care services	• 100% brushed teeth • 50% used mouthwash for patients with teeth • 80% cleaned and inserted dentures • 50% checked the mouths of patients with or without teeth	• 100% brushed teeth • 60% flossed • 80% brushed/wiped inside mouth and tongue • 80% used mouthwash for patients with and without teeth • 100% cleaned and inserted dentures • 50% used saliva substitute for patient with and without teeth (depended on the patients' needs) • 100% checked the mouths of all patients
Q. 15	Level of comfort in different aspects of mouth care	• 80% felt that they were adequately prepared	• 80% felt they were excellently prepared
Q. 16	Their own belief of seeing the dentist	• 50% saw the dentist regularly • 50% saw the dentist when there was a problem	• 100% saw the importance of seeing the dentist regularly

findings like a sore, lump or bump in the mouth to the attending physician;
- nurses were not familiar as to where to obtain the products needed to provide the proper oral care for their patients, and
- nurses had a strong belief in looking after their own oral health and that of their patients.

Table 2 demonstrates that four out of the nine "True and False" questions had posed a challenge. None of the unregulated care providers realized that dry mouth led to serious tooth decay and mouth infections, and that a toothbrush should not be stored in a container after each use. Half of the staff did not know that the massaging and cleaning of the gums were necessary for denture wearers, while most did not know that food would get trapped in the folds of the cheeks. All of the unregulated care providers were unfamiliar with how to obtain oral care products. Although all of them experienced barriers to providing the mouth care, they felt that they were adequately prepared on this topic. Half of the staff indicated that they had more than five years' experience in providing mouth care. Half of the staff indicated that they saw the dentist only when there was a problem such as a toothache.

The next three Tables show the results of the evaluations from each session. In the first education session (refer to Table 3), all the participants felt that the information presented was relevant to their practice of oral care, and liked having the opportunity of participating in the session. Most of them strongly agreed that they intended applying their new learning. The only concern that was flagged in this session was its duration, which the nurses felt was too long for them. It was indicated in the "comment" section that they were short of staff and had had heavy caseloads (about 16 patients per nurse per day or evening shift). During this session, the importance of oral care and oral health was discussed. There was participation from the other disciplines such as speech-language pathology, pharmacy and social work. The manager of the unit also took an interest in the presentation since she wanted to show her support to her staff. She also wanted to be a resource for her staff in case any questions or issues arose.

Some of the qualitative data collected for the first

session were:

It doesn't hurt to review a topic that we should all know.

The session was very informative. It's good to be reminded of how important oral care is.

All information is relevant to my knowledge.

It's all important info to know. Thanks for the overview!

I'm glad that our roles were clarified. Now I understand what I am accountable for.

The results for the second session (refer to Table 4) depicted that overall, all the participants felt that learning about the normal and abnormal oral conditions of the mouth were very relevant to their work and that they intended to apply this knowledge. The speech-language pathologist also participated in this session.

I definitely learned a lot of new conditions of the mouth. The pictures were really helpful.

I would like this lesson to be taught throughout the hospital.

The last session involved learning about oral care strategies and working on each other (refer to Table 5). Again all the participants strongly agreed that the information was relevant to their practice. The participants were not as comfortable working on each other, but felt it was necessary for them to experience this to increase their comfort level with using the oral care products on their patients. They had had the opportunity to feel what it was like to be on the receiving end of services. It was a "wake up call" to their senses—they tasted and felt the different products in their mouths.

I liked having the hands-on experience of using the products.

The hands-on experience helped me feel comfortable with the products.

In addition to our findings from the pre- and post education questionnaires and evaluations, the results of the hospital's oral care audit that the Toronto Public Health CLC (Collective Living Centres) dental team conducted every year at the hospital were also available. The audit involved 10 to 15 patients per unit who were randomly chosen and examined. An audit tool (refer to Figure 5) was completed for each patient. The numbers for only the neuromuscular unit from the years 2000 through to 2006 were extrapolated; therefore, these numbers do not reflect the hospital as a whole (as shown in Table 6).

DISCUSSION

From the pre questionnaires, we found that the participants, especially the personal service providers, had some knowledge about oral care in general. However, they felt uncomfortable with providing certain mouth care routines such as brushing dentures and inserting them, flossing and checking patients' mouths. It was also determined that the registered nurses had a strong belief in looking after their own oral health and that of their patients; however, provision of oral care was difficult due to the behaviour of certain patients who were resistive to basic care needs like showering, shaving, and changing clothes. While the nurses had strong beliefs about their own oral care, the personal service providers did not hold

Table 3. Results: Evaluation of session 1.

Statement	Result
All information presented is relevant to my practice of oral care.	• 100% strongly agree
I intend to apply my new learning to my work.	• 80% strongly agree • 20% agree
All questions or concerns I had were answered.	• 80% strongly agree • 20% agree
I liked having the opportunity to participate in the session.	• 100% strongly agree
I liked the photographs that were used in the slides.	• 80% strongly agree • 20% agree
The length of time for session 1 suited my needs.	• 80% strongly agree • 20% disagree (nurses)
The presenter(s) was/were clear and understandable.	• 100% strongly agree
Session 1 met my expectations.	• 100% strongly agree

Table 4. Results: Evaluation of session 2.

Statement	Result
All information presented is relevant to my practice of oral care.	• 100% strongly agree
I intend to apply my new learning to my work.	• 100% strongly agree
All questions or concerns I had were answered.	• 100% strongly agree
I liked having the opportunity to participate in the session.	• 100% strongly agree
I liked the photographs that were used in the slides.	• 80% strongly agree • 20% agree
The length of time for session 2 suited my needs.	• 70% strongly agree • 30% agree
The presenter(s) was/were clear and understandable.	• 100% strongly agree
Session 2 met my expectations.	• 80% strongly agree • 20% agree

Table 5. Results: Evaluation of session 3.

Statement	Result
All information presented is relevant to my practice of oral care.	• 100% strongly agree
I intend to apply my new learning to my work.	• 60% strongly agree • 40% agree
All questions or concerns I had were answered.	• 80% strongly agree • 20% agree
I liked having the opportunity to participate in the session.	• 90% strongly agree • 10% agree
I liked the photographs that were used in the slides.	• 80% strongly agree • 20% agree
The length of time for session 3 suited my needs.	• 60% strongly agree • 30% agree • 10% strongly disagree (nurse had heavy caseload)
The presenter(s) was/were clear and understandable.	• 100% strongly agree
Session 3 met my expectations.	• 90% strongly agree • 10% agree

Figure 5. Oral care audit tool.

Bridgepoint Hospital ORAL CARE AUDIT Winter 2005/06

Item	Yes	No	Comments
Bedside audit:			
• Does patient have own teeth?			
• Edentulous (no teeth)			
• Dentures_____ Upper_____ Lower_____			
• Oral cavity clean (good oral hygiene)			
• Dentures clean			
• Dentures in use			
• Toothbrush present			
Documentation:			
• Activity flowsheet completed			

Patient's initials ________________ Room number ____________ Date ____________________ Auditor's initials _______

such strong beliefs, with some of them indicating that they saw the dentist only when they had an issue like a toothache.

Before the education initiative, 80 per cent of the participants felt that behavioural issues were the main barrier in providing oral care for patients in their unit. After the education, the same 80 per cent indicated that behavioural issues were no longer a barrier due to the strategies discussed and learned. They also felt that the knowledge learned gave them the confidence in providing mouth care such as looking after dentures and assessing patients' mouths. They felt excellently prepared.

Another significant finding was definitely the role clarification in oral care practice with registered nurses and unregulated care providers. Through the questionnaires and feedback, it was clear that both disciplines did not have a clear understanding of what their role was in regards to oral care. Only 50 per cent of the registered nurses indicated that they were accountable for their own and that of the unregulated care providers' oral care practices. After the education intervention—and after the nurse educator had provided the nursing perspective and had addressed issues raised by the registered nurses—there was a positive outcome. All the registered nurses indicated (in the post questionnaires) that they felt accountable for their role. Table 7 was created and discussed in the first session to help clarify aspects of oral care each discipline was accountable for. The staff frequently referred to these responsibilities to ensure that the correct person was providing the care or that certain responsibilities were delegated to the unregulated care providers whenever necessary. Accountability was no longer an issue.

One of the factors that contributed to the success of the study was the positive change in the staff's approach to oral care. Opposed to working individually, they worked as a team, shared strategies and re-enforced best practices. The staff pointed out that their raised awareness after education sessions and support from the nurse educator, dental hygienist and manager had contributed to their success.

Some of the changes in practice were significant. For example,

- the registered nurse in charge of the evening shift established that oral care was delivered after dinner or before bedtime;
- mouth care was provided after the patient's tracheostomy was suctioned;
- patients were assisted with rinsing or cleaning their mouths, especially at night, after thickeners or apple sauce was administered with medication;
- the unregulated care providers said that they shared their effective strategies when providing care to patients with some challenging behaviours.

There was a marked improvement in the quality and consistency of oral care provided by both the nurses and unregulated care providers.

As brought to our attention through the evaluation forms, duration of the education sessions was a challenge, especially when staff numbers were less than ideal. If a nurse was absent, then each nurse had sixteen patients to care for instead of the usual twelve. Scheduling the education sessions was also very difficult since the participants worked rotating shifts; therefore, evening sessions were offered to accommodate their needs.

With the help of the Public Health CLC dental team, we were able to determine the effectiveness of the education initiative after a month of implementation. Table 6 compares the results of the following years: 2000, 2002, 2004 and 2006. There were many different variables that contributed to these results. In 2004, the number of patients with good oral care dropped to 50 per cent due to several factors: our patient population dramatically changed at the time; the needs of patients became more complex, and therefore, required more care. This also coincided with the SARS crisis in Toronto, where we were ordered by the Ministry of Health to transfer many of our patients who were functioning higher than others to long term care facilities or to assisted living centres to accommodate patients coming to us from acute care. The number in 2006 reflected the results of the oral hygiene education initiative. There was not only an increase in the level of staff satisfaction, but also in patient satisfaction. The Public Health CLC dental team, found that the patients were happier since their mouths were cleaner and healthier. These findings clearly reinforced the advantages of an education initiative intervention to achieve positive patient health outcomes.

The oral hygiene education initiative sparked an enthusiasm from other health professionals such as the speech–language pathologist. This showed that the awareness of the importance of oral health related to overall health was increasing and that collaboration was reinforced. During and after the study, it was not unusual to see nursing and dental personnel interacting for education sessions and strategy discussions. This enthusiasm should be fuelled.

CONCLUSIONS

One of the factors that contributed to the success of the study was the positive change in the staff's approach to oral care. They worked as a team, shared strategies and re-enforced best practices. The staff pointed out that their awareness was raised with the education sessions and with the researchers' support and knowledge. Some of the changes in practice were also significant, for example, the nurse in charge of the evening shift ensured that oral care was delivered after dinner or before bedtime; mouth care was provided after a patient's tracheostomy was suctioned; patients were assisted with rinsing or cleaning their mouths after medication was taken with thickeners or apple sauce, especially at night. The unregulated care providers said that they shared the strategies that were effective when providing care to patients with some challenging behaviours. Because the roles of the nurses and the unregulated care providers were redefined or clarified in regards to oral care, nurses' accountability was no longer an issue.

The research study was definitely a learning process. Along with successes, came challenges as well. One of the main limitations was having a small sample size. When the study participants took part in the education sessions, the staff who did not participate provided care to the patients with higher needs because the number of staff on the unit was not always ideal. Another challenge was

Table 6. Oral care audit results.

Patients with good oral hygiene; n=48 (Neuromuscular unit only)

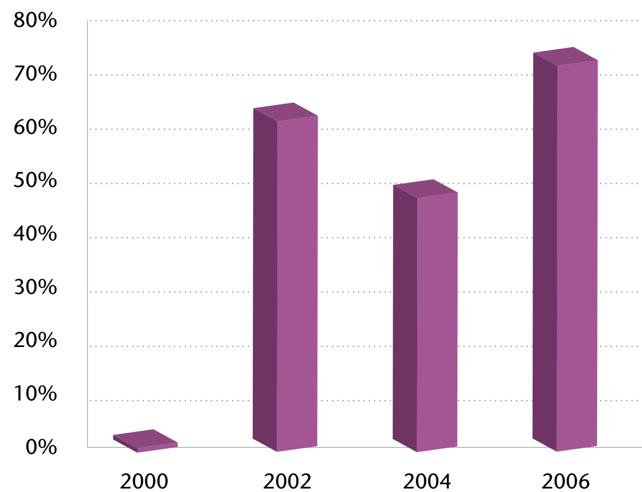

Table 7. Your role in oral care.

	Registered Nurse	Personal Service Provider
Assessment of the mouth	✔	
Observe mouth during oral care		✔
Oral care for patients	✔	✔
• Patients with oral pathology	✔	
• Trach patients	✔	
• Severe dysphagic patients	✔	
• Resistive patients	✔	✔
Suction toothbrush	✔	
0.12% Chlorhexidine rinse	✔	
Oral relief swabs	✔	✔
Oral balance mouth moisturizing gel	✔	✔

to change participants' perception about the research process. At first, they felt that the study would demand too much investment of time on their part, and they also felt that their performance was being evaluated. These points were clarified during staff meetings and through the use of recruitment letters; therefore, their perception changed. Scheduling education sessions was a challenge since the participants worked rotating shifts. Flexibility of time was considered to accommodate their needs. The duration of these education sessions was also a challenge especially on days when the staff numbers were less than ideal.

Implications for practice

A cascade of positive outcomes resulted from the education initiative. In terms of changes in practice, there was positive improvement in the quality and consistency of oral care provided by both disciplines. The knowledge transfer was evident at the bedside, thereby, meeting best nursing standards of practice. There was also an increase in the level of patient and staff satisfaction. Patients were gaining abilities through the knowledge transferred by the staff. These findings clearly reinforced the advantages of an education initiative intervention to achieve positive patient health outcomes. This also reinforced collaboration. During and after the study, it was not unusual to see nursing and dental personnel interacting with education sessions and discussing strategies.

Implications for future research

Research in the future could consider aspects such as:

1. Influence of education programs across the continuum of care in different areas of practice.
2. Involvement of nursing in other research projects in the context of unregulated care providers delivering most of the care.
3. Patient risk management perspective and the influence of better prepared nursing staff on patient safety.
4. Program of research in oral care for our patient population.

Acknowledgements

The authors gratefully acknowledge:

- The participants (staff and patients) from the Neuromuscular Disease Unit of Bridgepoint Hospital.
- Nicole Allard, manager of this unit—for her support of the study.
- Dr. Linda Yetman, (former Director of Nursing Practice and Education of Bridgepoint Health) for all of her feedback, guidance and encouragement throughout this study.
- Pauline Carpenter, Grace Lee and Dragana Markovic for assisting the authors with the background work.
- Dr. Catriona Steele, Research Scientist from Toronto Rehab Institute, for her mentorship and guidance.
- Carol-Ann Yakiwchuk, past president of the CDHA. Her work in long term care with colleagues inspired the authors to explore ways to improve oral health for their patients at Bridgepoint Hospital.
- Bridgepoint Hospital for supporting the authors in their education and research.

Supplementary Information

This study used pre questionnaires for the registered nurses and for personal service providers to gather data for the oral health education initiative. The study participants also completed an evaluation after each education session. These tools are available online at: www.cdha.ca/onlinejournal/education_session.pdf or may be obtained from the corresponding author.

REFERENCES

1. Coleman PR. Pneumonia in the long-term care setting: Etiology, management and prevention. *J Gerontol Nurs*. 2004;30(4):14–23.
2. Shaw M. Oral hygiene in the elderly: a nursing practice challenge. *Perspectives*. 1998;22:8–15.
3. Cherry-Peppers G and Schumaker CJ Jr. Dental health and long term care residents. *J Long Term Care Adm*. 1993 Spring;21(1):33–35.
4. Adams R. Qualified nurses lack adequate knowledge related to oral health, resulting in inadequate oral care of patients on medical wards. *J Adv Nurs*. 1996;24(3):552–60.
5. Pyle MA, Nelson S, Sawyer DR. Nursing assistants' opinions of oral health care provision. *Spec Care Dentist*. 1999 May/June;19(3):112–17.
6. Wardh I, Hallberg LR, Berggren U,Andersson L, Sörenson S. Oral health care—a low priority in nursing. In-depth interviews with nursing staff. *Scand J Caring Sci*. 2000;14(2):137–42.
7. Chalmers JM, Levy SM, Buckwalter KC, Ettinger RL, Kambhu PP. Factors influencing nurses' aides' provision of oral care for nursing facility residents. *Spec Care Dentist*. 1996;16(2):71–79.
8. Gil-Montoya J.A, de Mello AL, Cardenas CB, Lopez IG. Oral health protocol for the dependent institutionalized elderly. *Geriatr Nurs*. 2006 Mar–Apr;27(2):95–101.
9. College of Nurses of Ontario. Practice Guideline: Working with unregulated care providers. 2004. [Cited December 17, 2005]. Available from www.cno.org/Global/docs/prac/41014_workingucp.pdf.
10. Fitzpatrick J. Oral health care needs of dependent older people: responsibilities of nurses and care staff. *J Adv Nurs*. 2000;Dec:32(6):1325–32.
11. Gift HC, Atchison KA, Dayton CM. Conceptualizing oral health and oral health-related quality of life. *Soc Sci Med*. 1997;44(5):601–08.
12. Grap MJ, Munro CL, Ashtiani B, Bryant S. Oral care interventions in critical care: frequency and documentation. *Am J Crit Care*. 2003;12(2):113–19.
13. Holmes S. Nursing management of oral care in older patients. *Nurs Times*. 1996;92(9):37–39.
14. Martin KU and Martin JO. Meeting the oral health needs of institutionalized elderly. *Dysphagia*. 1992;7(2):73–80.
15. Paterson H. Oral health in long-term care settings. *Nurs Older People*. 2000;12(7):14–17.
16. Preston AJ, Punekar S, Gosney MA. Oral care of elderly patients: nurses' knowledge and views. *Postgrad Med J*. 2000;76(892):89–91.
17. Wardh I, Andersson L, Sörensen S. Staff attitudes to oral health care. A comparative study of registered nurses, nursing assistants and home care aides. *Gerodontology*. 1997;14(1):28–32.
18. Paulsson G, Fridlund B, Holmén A, Nederfors T. Evaluation of an oral health education program for nursing personnel in special housing facilities for the elderly. *Spec Care Dentist*. 1998;18(6):234–42.
19. Wener ME, Yakiwchuk CA, and Brothwell D J Healthy Mouth-Healthy Body: A Mouth Care In-Service Pilot Project. *Probe*. 2003 Jan/Feb;37(1):15–33.
20. Yoneyama T, Yoshida M, Ohrui T, Mukaiyama H, Okamoto H, Hoshiba K, Ihara S, Yanagisawa S, Ariumi S, Morita T, Mizuno Y, Ohsawa T, Akagawa Y, Hashimoto K, Sasaki H; Oral Care Working Group. Oral care reduces pneumonia in older patients in nursing homes. *J Am Geriatr Soc*. 2002;50(3):430–33. ©CDHA