

Dimensions of Oral Care Management in Texas Hospitals

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Introduction

The oral and systemic health connection is becoming clearer every day. Oral health is needed to achieve overall health, especially for individuals who have been hospitalized.^{1,2} Oral health problems can exacerbate their medical status and vice versa. Most importantly, improving their oral health may actually prevent hospital-acquired conditions (nosocomial) and/or improve their overall health.^{3,4} Many also need specialized oral care, such as patients who have mechanical ventilation. Finally, when they leave the hospital, these individuals may need a referral for follow-up oral care to maintain their health.

Nurses are the logical professional for providing oral care in the hospital, because they assess the health status of their patients on a regular basis. However, sources indicate that nurses do not receive much training in oral care management and might not consistently provide adequate oral care for their patients,⁵ and most hospitals do not employ dentists and/or dental hygienists to provide oral care. Although the literature reveals some information about the education of nurses and the knowledge and practices of some areas of hospital nursing, there has been no broad assessment of their knowledge, attitudes and practices. Since it is not known if nurses are providing oral care and if they have sufficient knowledge for doing so, the

Abstract

Purpose: There is a growing body of evidence that suggests improved oral health can help patient outcomes in hospitals. Yet there are indicators that oral care in hospitals is less than ideal. This study was conducted to quantify and qualify the dimensions of oral care in Texas hospitals with a focus on the dental knowledge, attitudes and practices of nurses and barriers to providing such care.

Methods: A random sample of 582 registered nurses, licensed and employed in Texas, was surveyed about oral care attitudes, practices and knowledge. Frequencies and Spearman correlations were used to describe and analyze the data with SPSS.

Results: Ninety-eight respondents returned surveys for a 16.8% response rate. Of these, 52% reported their nursing education did not ("minimally/not at all") prepare them for oral care management. However, they felt oral health was important (95%), felt responsible for oral care (79%) and assessed the oral cavity of their patients (78.6%). Although they reported being "knowledgeable" or "very knowledgeable" about oral health management (67%), their score on the knowledge questions was low (mean=51%, sd=0.132). There was not a significant correlation between the knowledge scores and education levels ($p=0.136$, $p>0.05$) or knowledge scores and work areas ($p=-0.080$, $p>0.05$). They also reported such barriers as low priority for oral care, lack of time, no mandate and the need for more resources.

Conclusion: This study revealed that nurses experienced a disconnect between feeling responsible yet somewhat incapable and/or ill-prepared to provide adequate oral care for their patients. This suggests a possible need for revising nurse education, hospital requirements and protocols for performing oral care and employing dental professionals in hospitals.

Keywords: nursing education, nurse practice patterns, inter-professional practice, hospitals, hospital administration, dental hygiene, oral health, dental care, assessment- patient outcomes and outcomes research

This study supports the NDHRA priority area, **Health Services Research:** Determine if differences exist in patient outcomes and costs for a given oral condition when services are provided by dental hygienists vs. other.

question of whether this vital need is being met in hospitals needs to be addressed.

Oral and Systemic Health Connection: The report of the Surgeon General clarified the role of oral health in maintaining overall health. Beyond healthy teeth, oral health includes being free of chronic oral–facial pain, oral and pharyngeal cancers, oral soft tissue lesions and birth defects, such as cleft lip and palate. The mouth is a mirror to the health of the body. An analysis of saliva can provide telltale clues of overall health or disease. The mouth can also reveal nutritional deficiencies, microbial infections, immune disorders, injuries and some cancers. Oral problems can also affect the health of the body. There is new evidence about associations between chronic oral infections and heart and lung diseases, stroke and low–birth–weight, premature births.

The U.S. Oral Health Workforce in the Coming Decade report further describes these associations between oral and general health.² Diabetes mellitus causes increased tissue destruction in diabetics with periodontitis, and periodontitis exacerbates glycemic control in diabetic patients. Diabetics who receive periodontal care have lower medical costs. A lesion in the mouth may be the first indication of HIV infection. In the future, saliva may be used to monitor chronic disease by measuring medications, hormones, environmental toxins and antibodies. Finally, oral cancer results in 8,000 deaths per year, and early detection is vital.

Many medications cause xerostomia, as well as radiation and chemotherapy treatments.⁶ Medication classes that may decrease salivary flow and cause xerostomia include antidepressants, diuretics, anticholinergics, antihistamines and opiates.⁷ In addition to discomfort, the lack of saliva can negatively affect overall health, because saliva has antibacterial properties and plays a role in the body's defense against infections.⁸

Oral care interventions have been shown to improve the overall health of hospitalized patients. A leading cause of death in intensive care units (ICUs) is ventilator–associated pneumonia (VAP). VAP occurs in 9 to 28% of patients that are treated with mechanical ventilation, and mortality rates range from 24 to 50%.⁹ This hospital acquired or nosocomial pneumonia is usually caused by aspirated bacteria that do not normally colonize in the oropharynx. Scannapieco et al conducted a systematic review of 36 studies to determine if oral hygiene interventions reduce the rate of pneumonia in hospitalized and nursing home patients.³ One main result was that mechanical and/or topical chemical disinfection reduced the incidence of nosocomial pneumonia by an

average of 40%. These interventions included topical antibiotics, chlorhexidine and iodine, as well as tooth brushing.

Oral mucositis can affect up to 100% of patients undergoing chemotherapy with hematopoietic stem cell transplantation (HSCT) and 80% with head and neck malignancies receiving radiotherapy. The signs and symptoms include erythema, edema, burning sensation, sensitivity to hot and spicy food and white patches on the mucous membranes (which become painful ulcers), the latter causing intense pain and difficulty in swallowing, speaking and eating, leading to malnutrition and dehydration. These ulcers can become infected, and this progression can delay the medical treatment plan, contribute to increased hospital stays and increased costs for care.^{10,11} In a controlled clinical trial on 70 HSCT patients, de Silva Santos et al demonstrated that enhanced oral care reduced the duration of mucositis.¹¹ In a longitudinal study of 53 HSCT patients, Soga et al demonstrated that an intensive oral care regimen actually reduced the prevalence of mucositis from 75 to 20%.⁴

Specialized Oral Care: Many hospitalized patients need specialized oral care. Orally intubated patients need daily cleaning of all oral surfaces with a toothbrush or sponge–tipped swab. Saline solution, mouthwash or chlorhexidine may be used as cleansing agents, followed by suction removal. The patient's airway must be protected to prevent aspiration, and the endotracheal tube must be stabilized (this may require using an assistant). Lubricants should be applied to the lips, and the endotracheal tube tape should be changed if it is loose or contaminated.⁷

Others needing specialized care include organ transplant and oncology patients undergoing chemotherapy or radiation therapy. For these, all possible sources of oral infection are taken care of prior to treatment, including extractions, restorations and periodontal therapy. Side effects such as xerostomia and mucositis need to be managed during therapy, and oral health needs to be constantly monitored after treatment. For the patients undergoing radiation therapy, strategies need to be in place to prevent osteoradionecrosis.¹²

Oral Care Knowledge, Opinions and Practices of Nurses: Nurse education is medically oriented, and oral health education has a low priority.^{13–15} In a survey of nursing students, McAuliffe found that 76% had only 2 to 3 hours of oral care education.¹⁶ Miller and Rubinstein surveyed Baltimore nursing students about their oral care knowledge and practices.⁵ The majority knew about plaque and its relationship to caries and gingivitis, but less knew how

to clean dentures, the best type of toothbrush and the role of toothpaste. They also did not know the appropriate way to brush and floss and how quickly plaque returned to the oral cavity.

Improving the education of nurses could improve their oral care practices. Furr et al conducted a national study to investigate how hospital factors, nurses' background, education and attitudes influenced the quality of oral care in ICU.¹⁷ They found that the following factors directly affected the quality of care that nurses provided: education in oral health, having enough time for oral care, having a higher priority for oral care and not perceiving oral care as unpleasant.

Regarding attitudes, Paulsson et al found in a qualitative study that nurses viewed oral care as very important for their own health and for their patients.¹⁸ They understood the link between good oral health and overall health, and they seemed motivated to help the care receivers with their needs and desires regarding oral care. In a study of ICU nurses by Binkley et al, over 90% reported that nurses should be responsible for cleaning the oral cavity of their intubated patients.¹⁹ The majority also wanted to learn more about oral care, although only about one third were interested in attending a continuing education workshop in ICU oral care.

Lack of time and the stress of trying to keep the critically ill patients alive lower their priority for oral care.^{6,20-22} In a survey of nurses by Adams, lack of time was the number one reason for not performing oral care.²³ Other influences were doing it "the way it has always been done here" and/or the views of the nurse manager towards dental care.^{18,24-26} In McAuliffe's survey of nurses, the majority agreed that "fitting in" and being a part of the ward were important to them, as well as adopting the oral hygiene practices of the more qualified nurses in the work place.¹⁶

Studies indicate that oral care practices are deficient or inconsistent in hospitals. A recent survey of nurses at the Children's Medical Center in Dallas found that only 27% reported "always" performing oral evaluations on patients.²⁷ Kinley and Brennan studied a palliative care unit and found that only 21% of the staff reported looking in the oral cavity on admission.²⁸ Only 28 to 56% of patients had a documented oral care assessment and only 10% had documentation about receiving oral care advice.

Certain factors have been identified as affecting hospital oral care practices. In a survey by Costello and Coyne, most of the nurses reported a lack of

toothbrushes and toothpaste.²¹ In the Binkley et al study, 46% felt they needed better supplies, such as chlorhexidine or pre-packaged oral care systems.¹⁹ These systems may include toothbrushes, suction swabs, pliable suction catheter to remove oral secretions and clear mouth moisturizer with aloe vera gel. Oral assessment guides provide detailed, step-by-step procedures for assessing the health of the oral structures, but they are not being used with much frequency.^{27,29} Lack of hospital standards for oral care can affect nurse practices. In 2 studies, the implementation of standard protocols and tools for oral care increased the quality and frequency of such care, as well as improved patient satisfaction.^{19,28}

All hospitalized patients need oral care and certain types of patients need very specialized care. Oral care interventions also improve the health of hospital patients. The purpose of this study was to quantify and qualify the dimensions of oral care in Texas hospitals. The specific research questions were as follows:

1. What was the knowledge level of nurses regarding the oral care of their patients?
2. What were their opinions about providing oral care?
3. What were their practices for assessing and providing oral care?
4. What factors affected their oral care practices?

Methods and Materials

Sampling Strategy: The participants in this study were registered nurses currently licensed and working in Texas hospitals. These nurses worked in the following specialty areas: home health, intensive/critical care, pediatrics, psychology/mental health, oncology, rehabilitation, general practice, geriatrics and medical/surgical. The participants were identified through the Texas State Board of Nursing website (www.bon.state.tx.us), which contains the specialty area of work, address, Texas County or state where the nurse currently works, license number, status and when it was issued. There were 390,000 registered nurses on this list, and the target population was the 57,563 currently employed in hospitals. The website data was sent to the investigator on a compact disc.

From this target population a probability, random sampling was used to select 382 nurses, the sample size calculated by Dillman's formula for an error rate of 0.05 and a 95% confidence level.³⁰ Because this formula assumes a 100% response rate, the sample size was increased to 637. SPSS was used to select 637 random numbers that were then matched to the numbered population list.

Survey Instrument: A 50 question survey instrument was designed to measure the oral care knowledge, practices and opinions of nurses. The survey started with demographic questions to assess number of years practiced, education, primary area of nursing, principal patient population and amount of patient contact. There were also 2 questions pertaining to whether or not nurses had taken continuing education courses about oral care. Next, there were 9 opinion questions, 12 knowledge questions and 17 questions about oral care practices, with the knowledge questions serving as a test. These knowledge questions, about both basic and specialized oral care, were developed in conjunction with 3 experts – 1 nurse and 2 dental hygienists.

At the beginning of the practice section, a filter question allowed for 2 branches – one for those who did oral assessments and one for those who did not. For the latter group, there was a question regarding why oral assessments were not done and if an oral assessment guide would facilitate assessment. The last 3 questions on the survey were open-ended for providing further information regarding oral care practices and any other information they wanted to add regarding the oral care of their patients.

The survey instrument was pilot tested with 6 nurses who were currently licensed and working at Medical City in Dallas, Texas. All of the nurses worked in bone marrow or stem cell transplant units, areas where patients have special oral care needs. The nurses suggested adding a PhD level of nursing and including more knowledge questions about oral care. These changes were subsequently made to the survey instrument.

Survey Procedures: The survey package included the following items: survey, cover letter with investigator signature and stamped return envelope. There were 2 mailings, the initial and the follow up for non-respondents. The informed consent was in the cover letter, and permission was assumed with the return of the survey. The surveys were coded to link them to the identity of the nurses. An assistant tracked the return of the surveys so that the investigator did not know the identity of the respondents. This link was destroyed after data analysis was completed. This project was granted exempt status by the Institutional Review Board of

Figure 1: Years in Practice

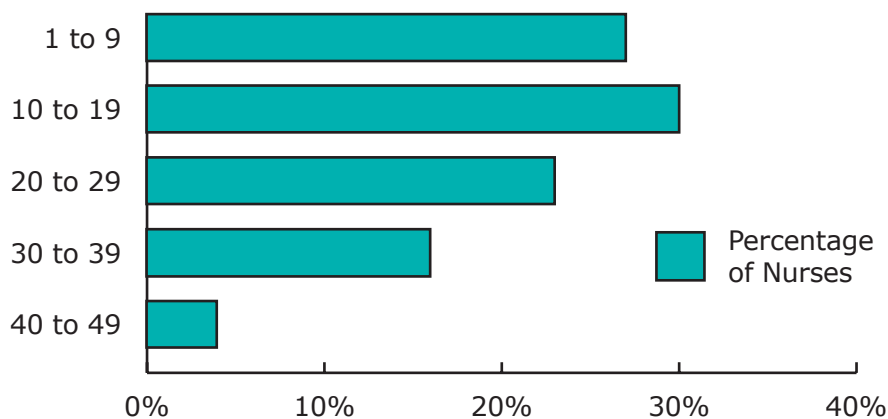


Table I: Level of Education

Education	Count	Percentage
Diploma	10	10%
Associates	32	33%
Bachelors	42	43%
Masters	13	13%
Doctorate	1	1%
Total	98	100%

the Texas A&M Health Science Center Baylor College of Dentistry.

Data Analysis: SPSS v.16 was used for statistical analysis. Descriptive statistics were used to identify the oral care knowledge, opinions and practices of the nurses, and Spearman rank order correlation was used to identify the factors that affected these practices.

Results

A total of 98 surveys were returned for a response rate of 16.8% (98/582). Fifty-five of the 637 nurses had incorrect addresses. Although the response rate was lower than anticipated, this is not unusual in the current environment where surveys are used extensively for collecting information.

Demographics: As illustrated in Figure 1, the largest group of respondents had practiced between 10 and 19 years (30%), followed by those who had practiced from 1 to 9 years (27%). As shown in Table I, the largest group of respondents held a bachelors degree in nursing (43%), followed by an associates degree (33%). The largest group of nurses worked in intensive/critical care (39.8%) and had patient contact 10 or more times daily (55.1%)

Only a minority of respondents (n=25) had attended a continuing education course on the oral

Table II: Self-Reported Knowledge, Preparation and Confidence for Oral Care Management

Question	Not at all (1)		Minimal (2)		Enough* (3)		Very much (4)		Total	
	n	%	n	%	n	%	n	%	n	%
How knowledgeable they were about oral care (median=3)	1	1%	31	32%	56	57%	10	10%	98	100%
How well their program prepared them (median=2)	7	7%	44	45%	39	40%	8	8%	98	100%
How confident they felt to provide oral care (median=3)	2	2%	11	12%	53	54%	31	32%	98	100%

*Actual response categories were "knowledgeable," "prepared" and "confident."

Table III: Responsibility and Importance of Oral Health

Question	Not at all (1)		Minimal (2)		Enough* (3)		Very much (4)		Total	
	n	%	n	%	n	%	n	%	n	%
How important is the oral health of their patients (median=3)	0	0%	5	5%	49	50%	44	45%	98	100%
How responsible they felt for providing oral care (median=3)	6	6%	15	15%	35	36%	42	43%	98	100%

*Actual response categories were "important" and "responsible."

care management of their patients. Of these, the largest had only attended 1 class (n=13). When asked if they were interested in attending a continuing education course, 41% responded "interested" followed by 32% "minimally interested."

Opinions: The survey asked questions regarding nurses' opinions about the oral care management of their patients (Table II). The majority of the nurses reported they were "knowledgeable" (57%), but 32% reported only "minimally knowledgeable." When asked if their nursing program had prepared them for providing oral care, 45% reported only "minimally prepared." Regarding their confidence to provide oral care, 54% reported "confident" and 32% "very confident."

When asked how important the oral health of their patients was to them, 50% responded "important" and 45% "very important" (Table III). Forty-three percent of the respondents felt "very responsible" for providing oral care to their patients and 36% felt "responsible."

Table IV illustrates the specific oral care activities for which they felt responsible. The majority of nurses felt responsible for all the activities except gum health (42%). Most important, 90% felt responsible for cleaning the mouth of their patients.

Table IV: Oral Care Activities for Which Nurses Felt Responsible

Activities	n	%
Cleaning the mouth	88	90%
Alleviating pain in the mouth	74	76%
Denture care	73	75%
Dry mouth	71	72%
Checking the mouth for lesions	69	70%
Checking for missing or loose teeth	54	55%
Gum health	41	42%
No oral care	3	3%

The respondents were asked to rank the top 2 reasons for wanting their patients to maintain healthy mouths. Figure 2 shows their first and second choices. Prevention of infection was most frequent first choice of respondents, but "comfort" was the most frequent for first and second choices combined.

Knowledge: Figure 3 illustrates the spread of the scores on the knowledge portion of the survey (12 questions). The majority of the scores ranged from 40 to 60%, with a mean of 50.5% (sd=0.132). Therefore, the respondents performed poorly on the knowledge portion of the survey. Contrary to expectations, there was not a significant correla-

tion between the scores on the knowledge questions and education level of the nurses ($\rho=0.136$, $p>0.05$) or areas in which the nurses worked ($\rho=-0.080$, $p>0.05$).

Table V shows the questions that were answered correctly the majority of the time. Regarding the most common problem created by dental plaque, 89.8% correctly answered "gum disease." The majority of respondents also correctly answered that the toothbrush was the best tool to remove plaque (52%), and the best treatment for candidiasis was antifungal medications (72.4%).

Table VI shows the questions that were answered incorrectly the majority of the time. Ninety-nine percent of the nurses did not know all the conditions that could have the symptom of bad taste. Ninety-seven percent also did not correctly identify all of the medications that can adversely affect the mouth. Particularly disturbing was the fact that only 28.6% knew that dental plaque appears in the mouth after 24 hours in an intubated patient.

Practices: The majority of nurses ($n=77$, 79%) reported providing oral assessments on their patients. When asked if they were required to perform this on every patient, they reported "yes" according to hospital policy (61.2%) and the nurse manager (50%). Those nurses who performed oral assessments were then asked a series of questions about their practices. Regarding when they looked in a patient's mouth, 49% stated that they did at every assessment, 22% only when patients were first admitted, 21% only when they complained and 11% prior to a major surgery.

Regarding time spent expended for oral care, the largest group spent 5 to 10 minutes per patient (41%), and the second largest group spent less than 5 minutes (38%). When asked how the oral care was documented, 71% stated they recorded it in the patient's chart. However, 8% said they did not document it at all.

The majority of respondents (69%) said they had the supplies they needed for providing oral care. Tables VII and VIII illustrate the equipment they reported using for oral assessments and oral

Figure 2: First and Second Choices for Why Patients Should Maintain Healthy Mouths ($n=76$)

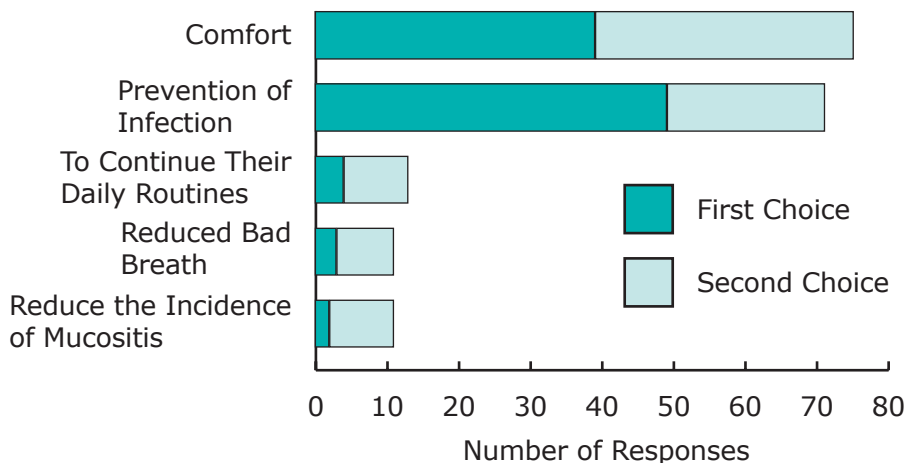
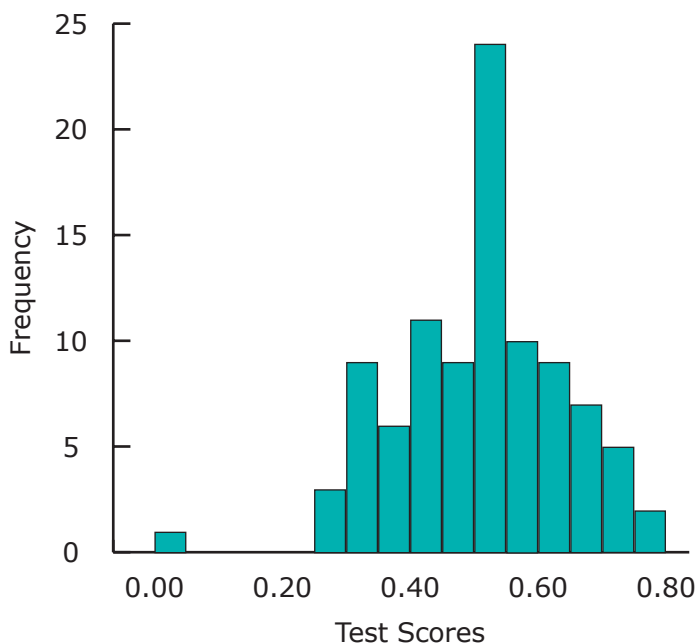


Figure 3: Distribution of Scores on Knowledge Questions ($n=96$)



Mean=0.51
Standard Deviation=0.132

cleanings (plaque removal). The majority of nurses reported using gloves (96%) and tongue depressors (78%) for oral assessments and toothbrushes (82%), gloves (81%) and foam brushes (71%) for oral cleansings. Only 10% reported using some form of oral assessment guide.

The nurses were also asked to identify the most common oral care problems they encountered (Table IX). The most common oral care problems were dry mouth (48%) and missing teeth (36%). Candidiasis (thrush) was not originally on the survey

but was added by 9 respondents.

Regarding the frequency of referrals within the last 6 months (Table X), the largest group of nurses (46%) had not referred a patient to a dentist. The majority of nurses (55%) referred to the patient's personal dentist, while 26% referred to a hospital-employed dentist (Table XI).

For those who did not assess the oral cavity (n=21), the primary reason was it is not a part of hospital protocol to do an oral assessment (n=11), followed by lack of education (n=8), "I am not sure how do an oral assessment" (n=6), not required by nurse manager (n=4), no time (n=3) and not a nursing responsibility (n=3). Seventy percent of these same nurses "disagreed" (50%) or "strongly disagreed" (20%) that an oral assessment guide would result in them doing an assessment.

Open-ended Questions: Table XII illustrates the qualitative results of the open-ended questions. For the question of what else they wanted to report about nursing oral health care, the most common theme was oral health is not important. A related theme was the nurses were not required to provide oral care, and the provision of it was not well monitored. In fact, there seemed to be confusion about which hospital professionals were responsible. Respiratory therapists, patient care assistants and nurse technicians were all mentioned as responsible. The second most common theme was they had no time to provide oral care. They were just too busy, and their main priority was preventing VAP. An equally reported theme was nurses did not have enough education for oral care management. The mere act of completing the survey led some respondents to the realization that their oral care knowledge was deficient. The final theme, the unpleasantness of oral care, is well conveyed by the quotations in Table XII.

Regarding the question of what other resources they needed for oral care (Table XII), the most common theme was again more education, including in-service by dental professionals and continuing education. An equally reported theme was the need for more equipment, specifically light sources and dental mirrors. Next was instructions for nurses, including detailed checklists, instructions on how to do an oral assessment and images of what to look for in an oral assessment. All of these would be part of an oral assessment guide.

Discussion

A cross section of experience was represented in this sample, with a large proportion of both new and experienced nurses. Although minimally

Table V: Frequency of Questions Answered Correctly

Question	% Correct	Correct Answer
Most common problem created by dental plaque? (SQ24)	89.8%	Gum disease
Best treatment for candidiasis (thrush)? (SQ21)	72.4%	Antifungal medications
How often should dentures be cleaned? (SQ25)	65.3%	2 times daily
Best tool for removing plaque? (SQ19)	52.0%	Toothbrush
How often should the appliance be changed in an intubated patient? (SQ27)	50.0%	Every day

trained, they believed they were knowledgeable about oral care management and felt responsible for providing it. Although they reported conducting oral assessments on their patients, almost one half only looked in patients' mouths when they were first admitted or when they complained. Also, their knowledge of current oral care practices was deficient according to the evaluation conducted in this research project. Moreover, they identified barriers to providing oral care in their hospitals.

Preparation for Oral Care Management: Over one half of the nurses in this study did not feel their education prepared them for oral care management. Other studies have shown that nurses lack education about oral care and give it a low priority in their work.^{5,13-15} The U.S. Oral Health Workforce report by the National Academy of Sciences also stressed the need for modifying the curricula of non-dental professionals to include oral health information.² A conclusion that could be drawn here is that the nursing curriculum on oral care management needs to be expanded. Regarding continuing education on oral care, although only one quarter of respondents had attended such a course, three quarters had some interest in attending. This suggests that nurses should be given the opportunity to attend oral care continuing education courses.

Opinions: The majority of the nurses believed that oral health was important. They also felt knowledgeable about the oral care management of their patients and responsible for providing it. The latter finding is supported by the study by Binkley et al where nurses also felt responsible for

cleaning their patient's mouth.¹⁹

Practices: The majority of respondents reported providing some oral care to their patients. About three quarters performed oral assessments, and almost one half examined the mouth at every assessment. However, that still left a large proportion of patients who were not receiving oral examinations. Also, it is possible that there was an over-estimation of the amount of oral care provided, as well as self-reported knowledge. There may have been volunteer bias, where nurses most interested in oral health responded to the survey, or non-respondent bias, where those most disinterested, uncomfortable or unaware of its importance did not respond.

Almost two thirds of the nurses reported spending 5 to 10 minutes or more on oral care per patient. The majority reported that their hospital had the supplies they needed, including gloves, tongue depressors, toothbrushes and foam brushes. Since a lack of oral care tools was not cited as a reason for not conducting oral assessments, a shortage of these was not a critical factor in this study.

About two thirds of the nurses were required by their hospital and one half by their nurse managers to conduct oral assessments. The nurses who did not perform oral assessments largely attributed this to hospital protocol not requiring it. This suggests that having a requirement for oral care is necessary for ensuring its provision in hospitals.

Although only a small proportion used oral assessment guides, some nurses believed it would help them provide oral care. It would certainly establish a protocol to follow that would ensure all oral needs are being identified. This is supported

Table VI: Frequency of Questions Answered Incorrectly

Question	% Incorrect	Correct Answer
Bad taste could be a symptom of what? (SQ22)	99%	All choices except high cholesterol
22a. Antibiotics they are taking	(18.4%)	
22b. Kidney stones	(95.9%)	
22c. Poor oral hygiene	(17.3%)	
22d. High cholesterol	(94.9%)	
22e. Lichen planus	(87.8%)	
22f. Anemia	(83.7%)	
22g. Cancer	(57.1%)	
22h. Tooth decay or abscesses	(13.3%)	
What drugs have the potential to adversely affect the mouth? (SQ18)	97%	All choices except birth control pills
18a. Blood Pressure medications	(50.0%)	
18b. Cholesterol medications	(78.6%)	
18c. Birth control medications	(80.6%)	
18d. Seizure control medications	(31.6%)	
18e. Anxiety medications	(48.0%)	
18f. Antidepressant medications	(26.5%)	
How long before bacterial plaque appears in an intubated patient's mouth? (SQ26)	71.2%	24 hours
Best option for non-restorable teeth? (SQ20)	59.1%	Extraction of non-restorable teeth immediately
Current recommended dose of Chlorhexidine to be given daily? (SQ23)	57.1%	30 ml/day
At what point can immune suppressed patients have their teeth cleaned? (SQ16)	51.8%	6 months

Table VII: Equipment Used for Oral Assessments

Equipment	Count	Percentage*
Gloves	74	96%
Tongue depressor	60	78%
2x2 gauze	26	34%
Penlight	12	16%
Mirror	10	13%

*Percentages reflect those who do oral assessments, 77/98 total respondents.

by the Kinley et al study where they found that implementing standard protocols and tools increased the quality and frequency of oral care.²⁸

Almost one half of the nurses had never referred a patient to a dentist in the last 6 months. Since hospitalized patients may have associated oral problems or susceptibility, they need continu-

Table VIII: Equipment Used for Oral Cleanings

Equipment	Count	Percentage*
Toothbrush	63	82%
Gloves	62	81%
Foam brush	54	71%
Chlorhexidine	34	44%
2x2 gauze	24	31%
Mirror	15	19%
I do not do oral cleansings	10	13%
Fluoride Rinse	8	10%

*Percentages reflect those who do oral assessments, 77 of 98 total respondents.

Table X: Frequency of Dental Referrals in the Last Six Months

Frequency	Count	Percentage
Never	35	46%
1–2 times	28	37%
3–5 times	8	11%
6–8 times	1	1%
More than 8 times	4	5%
Total	76	100%

ing oral care once they leave. For example, an oncology patient who has received radiation therapy needs ongoing assessment for the signs and symptoms of osteoradionecrosis. Also, follow up is needed for the control of periodontal disease, because it is so closely associated with systemic health.

Knowledge: The majority of respondents performed poorly on the test portion of the survey. The questions missed most often concerned the effects on medications on the oral cavity and appropriate management of special oral problems. For example, nurses should know that certain drugs adversely affect the oral cavity. The fact that nurses did not feel responsible for the gum health of their patients illustrates their lack of knowledge about the oral and systemic health connection. This suggests that their care of patients could be improved with more current information about these topics, either in their nursing education or in continuing education.

One could hypothesize that certain areas of nursing would encounter oral problems more frequently than others, such as oncology and ICUs, and would have a greater knowledge of oral care.

Table IX: Most Common Oral Care Problems Reported

Problems	Count	Percentage*
Dry mouth	37	48%
Missing Teeth	28	36%
Caries	22	29%
Mucositis	20	26%
Mouth Lesions	19	25%
Loose Teeth	17	22%
Candidiasis (Thrush)	9	12%

*Percentages reflect those who do oral assessments, 77/98 total respondents.

Table XI: Referral Sources

Referral Sources	Count	Percentages
Patient's personal dentist	23	55%
Hospital employed dentist	11	26%
Dentist in the community	5	12%
Did not refer them to a dentist	3	7%
Total	42	100%

This could also apply to years of education. However, neither of these influenced the nurses' performance on the knowledge portion of the survey. These findings further highlight the lack of oral care education and knowledge of nurses and stress the need for change.

Reasons for Lack of Oral Care: The responses of the nurses revealed a disconnect between feeling responsible yet somewhat unable or ill-prepared to provide adequate oral care for their patients. They said they did not have enough time for oral care on top of all the other tasks they had to perform. They were focused on saving lives, and thus oral care had a very low priority. They also did not know how to administer oral care, and many were not required to provide it. Some were even unsure whether oral care was their responsibility or that of another health care provider in the hospital, such as the respiratory therapists or the certified nursing assistants.

Collaboration/Inter-professional Practice: This study suggests that nurses need further resources for oral care management. Minimally, in-service courses could be developed that are taught by dental specialists. Miller and Rubenstein

Table XII: Qualitative Themes & Responses to Open Ended Questions

Themes	Responses	n*
Question 49. Is there anything else you would like us to know about nursing oral health care?		33
Oral health is not important and overlooked	<ul style="list-style-type: none"> • "I know that proper oral hygiene is important for maintaining patient's health, but in reality I see it is not given as high a priority as it deserves as a tool to compete (fight) the illness." • "There needs to be more of it, and it is usually omitted from routine patient care." 	8
No time to provide oral care	<ul style="list-style-type: none"> • "My main priority was preventing VAP (ventilator acquired pneumonia)." • "All the nurses are busy and it is easier to skip it." • "There is not enough time. In our hospital the RT's (respiratory therapists) are responsible for it." 	5
Not enough education for oral care management	<ul style="list-style-type: none"> • "Oral care seems to take a back seat to other disease processes and needs to be stressed more in our schools and to our patients—I will take a CE (continuing education) course after taking your survey. I see I am severely lacking in my knowledge base." • I "recently read a nursing journal article on oral hygiene and it shocked me—I think this kind of information should be available to all nurses, patient care techs, and doctors as mandatory education." • "I unfortunately have very poor knowledge in this area, and I am embarrassed." • "I feel this is an area that is not assessed or taught to nurses properly." 	5
Not part of nursing protocol and "loosely monitored"	<ul style="list-style-type: none"> • "... nurses and techs do not feel that oral care is that important, and supervisors do not follow up and so it is not done." • "Other people such as RT's (respiratory therapists) are responsible for oral health care of patients." • "It seems that oral mouth assessments and care could be provided by patient care assistants in accordance with set policy protocols." 	3
Oral care is unpleasant	<ul style="list-style-type: none"> • "Unresponsive, mouth breathers have dry thick chunks that stick on their tongue or roof of the mouth. Many nurses and techs won't touch it. They need teaching on oral care, cleaning, and suction." • "Most nursing staff I know are completely disgusted with oral care. 'Let the CNAs (certified nursing assistants) take care of it.' I don't mind the oral care, since I was a dental assistant for two years." 	3
Question 50. What else might you need to do an oral assessment, oral cleansing/plaque removal and oral hygiene instructions at your hospital?		51
More education	<ul style="list-style-type: none"> • "I had a patient that was recently transferred to our unit from ICU (Intensive Care Unit) with respiratory and swallowing problems and found hard buildup of food and drainage at the back of her tongue—no one from ICU had assessed this for over a week. Obviously, nursing in all areas is in need of education in oral assessments as well as physicians." • In-service on oral health care done by a dentist or dental hygienist • Continuing education 	10
More Equipment	<ul style="list-style-type: none"> • Light sources and dental mirrors 	10
Instructions for nurses	<ul style="list-style-type: none"> • Detailed checklists • Instructions on how to do an oral assessment • Images of what to look for • Oral assessment guide 	9
Instructions for patients	<ul style="list-style-type: none"> • "Pointed instructions so that patients can read and learn self care" 	3

*The N values for the individual themes do not add up to the overall N values, because there were additional unrelated responses that were not included here.

recommended that nurses use dental publications for their education and hire dentists and dental hygienists as lecturers and consultants.⁵ Continuing education on oral care could also be devel-

oped and even required for licensure. If dental hygienists were employed in hospitals, nurses could collaborate with them on the oral care treatment plans for patients. Dental hygienists could even

manage the oral care of hospitalized patients, freeing up the nurses to focus on all the other critical interventions that are needed. This inter-professional practice at the hospital would provide optimal care for the patients and relieve the stress of the nurses. The Surgeon General's report on oral health stressed the need for health care providers to collaborate with dental professionals in providing optimal oral health for patients. This would necessitate curriculum changes to their educational programs and multidisciplinary training.¹ At least 2 Institute of Medicine reports have identified inter-professional care as the future vision for patient-centric, evidence-based health care, for all health professions and specifically for nursing.^{31,32}

Conclusion

The increasing awareness of the significant relationship between oral and systemic health highlights the importance of oral care management in hospitals. This is further amplified by the growing body of evidence that improved oral status can improve health outcomes in hospital settings – the lowering of morbidity and mortality. Making oral care management a higher priority might significantly improve the health of hospitalized patients. The following recommendations were suggested by this research project:

- Increase the amount of oral care management education that nurses receive in their nursing programs. This study could help nurse educators evaluate their curriculum and include more oral health education.
- Develop hospital policy and protocols that mandate daily oral assessments and oral care for all patients. In this study, oral care was not performed, because it was not hospital protocol or

required. Policy and protocols would include the tools needed for oral care and oral assessment guides to standardize the examination process.

- Provide oral care education for nurses at their hospitals through in-service and guest speakers. Lack of education and not knowing how to provide oral care was another reason for not conducting oral care. In-service education by dental professionals could improve their oral care skills.
- Require all nurses to take at least 1 continuing education class a year about oral care. Requiring continuing education courses would ensure that nurses received the most current information about oral care management.
- Hire dental hygienists and dentists to do the oral care management of patients in hospitals, because it is their specialized field. They could work with nurses and other hospital personnel in the inter-professional treatment of patients to ensure the best possible care and health outcomes.

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References

1. U.S. Department of Health and Human Services. Oral health in America: A report of the Surgeon General. U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health. 2000.
2. Harris TA. The U.S. oral health workforce in the coming decade: Workshop summary. National Academy of Sciences [Internet]. 2009 [cited 2011 February 21]. Available from: <http://www.nap.edu/catalog/12669.html>
3. Scannapieco FA, Bush RB, Paju S. Associations between periodontal disease and risk for nosocomial bacterial pneumonia and chronic obstructive pulmonary disease. A systematic review. *Ann Periodontol*. 2003;8(1):54–69.
4. Soga Y, Sugiura Y, Takahashi K, et al. Progress of oral care and reduction of oral mucositis—a pilot study in a hematopoietic stem cell transplantation ward. *Support Care Cancer*. 2010;19(2):303–307.
5. Miller R, Rubenstein L. Oral health care for hospitalized patients: The nurse's role. *J Nurs Educ*. 1987;26(9):362–366.
6. Jones H, Newton JT, Bower EJ. A survey of the oral care practices of intensive care nurses. *Intensive Crit Care Nurses*. 2004;20(2):69–76.
7. Treloar DM, Stechmiller JK. Use of a clinical assessment tool for orally intubated patients. *Am J Crit Care*. 1995;4(5):355–360.
8. Malkin B. The importance of patient's oral health and nurses' role in assessing and maintaining it. *Nurs Times*. 2009;105(17):19–23.
9. Chaste J, Fagon J. Ventilator-associated pneumonia. *Am J Respir Crit Care Med*. 2002;165(7):867–903.
10. Sieracki RL, Voelz LM, Johannik TM, Kopaczewski DM, Hubert K. Development and implementation of an oral care protocol for patients with cancer. *Clin J Oncol Nurs*. 2009;13(6):718–722.
11. Santos PS, Coracin FL, Barros JC, Dulley FL, Nunes FD, Magalhães MG. Impact of oral care prior to HSCT on the severity and clinical outcomes of oral mucositis. *Clin Transplant*. 2011;25(2):325–328.
12. Little JW, Falace DA, Miller CS, Rhodus NL. Dental management: A summary in dental management of the medically compromised patient. St Louis (MO): Mosby-Elsevier; 2008.
13. White R. Nurse assessment of oral health: A review of practice and education. *Br J Nurs*. 2000;9(5):260–266.
14. Paulsson G, Söderfeldt B, Nederfors T, Fridlund B. The effect of an oral health education program after three years. *Spec Care Dentist*. 2003;23(2):63–69.
15. Shepherd G, Page C, Sammon P. Oral hygiene. The mouth trap. *Nurs Times*. 1987;83(19):24–27.
16. McAuliffe A. Nursing students' practice in providing oral hygiene for patients. *Nurs Stand*. 2007;21(33):35–39.
17. Allen Furr L, Binkley CJ, McCurren C, Carrico R. Factors affecting quality of oral care in intensive care units. *J Adv Nurs*. 2004;48(5):454–462.
18. Paulsson G, Söderfeldt B, Nederfors T, Fridlund B. Nursing personnel's views on oral health from a health promotion perspective: A grounded theory analysis. *Acta Odontol Scand*. 2002;60(1):42–49.
19. Binkley C, Furr LA, Carrico R, McCurren C. Survey of oral care practices in US intensive care units. *Am J Infect Control*. 2004;32(3):161–169.
20. Abidia RF. Oral care in the intensive care unit: A review. *J Contemp Dent Pract*. 2007;8(1):76–82.
21. Costello T, Coyne I. Nurses' knowledge of mouth care practices. *Br J Nurs*. 2008;17(4):264–268.
22. McNeill HE. *Biting back at poor oral hygiene*. *Intensive Crit Care Nurses*. 2000;16(6):367–372.
23. 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):552–560.
24. Paulsson G, Nederfors T, Fridlund B. Conceptions of oral health among nurse managers. A qualitative analysis. *J Nurs Manage*. 1999;7(5):299–306.

25. Peate I. Nurse-administered oral hygiene in the hospitalized patient. *Br J Nurs.* 1993;2(9):459–462.
26. Young BC, Murray CA, Thomson J. Care home staff knowledge of oral care compared to best practice: A west Scotland pilot study. *Br Dent J.* 2008;205(8):E15.
27. Tewogbade A, FitzGerald K, Prachyl D, Zurn D, Wilson C. Attitudes and practices of nurses on a pediatric cancer and stem cell transplant ward: Adaptation of an oral care protocol. *Spec Care in Dentist.* 2008;28(1):12–18.
28. Kinley J, Brennan S. Changing practices: Use of audit to change oral care practices. *Int J Palliat Nurs.* 2004;10(12):580–587.
29. Eilers J, Berger A, Peterson M. Development, testing, and application of the oral assessment guide. *Onco Nurs Forum.* 1988;15(3):325–330.
30. Dillman DA. Mail and internet surveys: The tailored design method. 2nd ed. Hoboken (NJ): John Wiley & Sons, Inc.; 2007.
31. Greiner AC, Knebel E. Health professions education: A bridge to quality. National Academy of Sciences [Internet]. 2003 [cited 2011 February 21]. Available from: <http://www.nap.edu/catalog/10681.html>
32. Committee on the Robert Wood Johnson Foundation Initiative on the Future of Nursing at the Institute of Medicine, Institute of Medicine. A summary of the February 2010 forum on the future of nursing: Education. National Academy of Sciences [Internet]. 2010 [cited 2011 February 21]. Available from: <http://www.nap.edu/catalog/12894.html>